Avanton Richmond Development Ltd

Homebase,, Manor Road, Richmond

Transport Assessment Addendum

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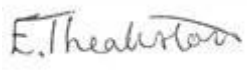
Prepared by	Elizabeth Theakston		24/08/2023
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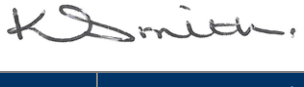
Approved by	Karen Smith		25/08/2023

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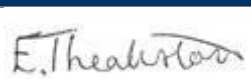
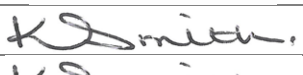
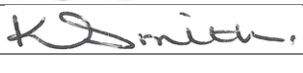
02	25/08/2023	Final	Report amended following project team review	Prepared	
				Checked	
				Approved	
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Acknowledgements

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1. Introduction

1.1 Development Proposals Background

1.1.1 A planning application for the redevelopment of the Site was submitted to London Borough of Richmond upon Thames (LBRuT) in February 2019 (ref. 19/0510/FUL) (the 'Original Proposed Development'), and was considered at LBRuT Planning Committee on 3 July 2019. The Planning Committee resolved that they were minded to refuse the Application, however on 29 July 2019 it was confirmed that the Mayor of London would act as the local planning authority for the purposes of determining the application.

1.1.2 Following review of LBRuT's reasons for refusal and discussions with Officers at the Greater London Authority (GLA) and Transport for London (TfL), the Applicant sought to review the scheme, with the principle aim of increasing the delivery of affordable housing through additional density and addressing other issues raised in the Mayor's Stage 2 Report. Initial scheme amendments were submitted in November 2019 ('the November 2019 Amendments') and increased the overall number of units by 48, primarily through the introduction of a new residential building known as Block E.

1.1.3 Following further discussions with TfL and the GLA, it was subsequently agreed that further revisions should be explored in order to deliver an improved scheme, without the need for this additional block.

1.1.4 The proposed changes are described in detail in the Design and Access Statement Addendum (July 2020), however, of particular note is the increase in residential units from 385 within the Original Proposed Development (Feb 2019 submission) to 453 within the Amended Proposed Development (July 2020 submission).

1.1.5 This increased the total number of affordable units by 39 to a total of 173 affordable homes (40% by habitable room taking account of grant funding, increased from 35% as originally submitted). This increase in units and the higher affordable housing provision was principally achieved through amendments to the height and internal layout in appropriate locations across the Site.

1.1.6 The June 2020 Revised Transport Assessment, therefore, provided an assessment of the Amended Proposed Development and considered the impact of the amended proposals in comparison to the Original Proposed Development. This addendum report retains all such references and analysis.

1.1.7 A further Addendum to the Transport Assessment was submitted in November 2021 to address South Western Railway's Timetable Consultation and assess whether the proposed changes would impact the PTAL rating of the site (84 Manor Road, North Sheen).

1.1.8 Travel Plans have been developed for the site which set out the strategies and initiatives that will be adopted in order to encourage the use of sustainable modes of travel associated with the development. This Transport Assessment Addendum should be considered in conjunction with the previously submitted Travel Plans.

1.2 Purpose of This Addendum

1.2.1 Following the Government's announcement in July 2023 confirming the intention to mandate second staircases in new residential buildings above 18 metres, the proposals have been revised to ensure all buildings above 18 metres meet these standards and present the highest standard of fire safety. This has been accommodated through internal changes, including improving the efficiencies of circulation space and reductions in unit sizes, and minor external changes, including marginal increases in building footprint. The full extent of the changes are set out in the accompanying DAS Addendum, but are summarised as follows:

- → Block A, Core A: a 450mm (or 45cm) extension in footprint to the south;
- → Block A, Core AD: a 225mm (or 22.5cm) extension in footprint to the south;
- → Block B: a 112.5mm (or 11.25cm) extension in footprint to the south and a 112.5mm (or 11.25cm) extension to the north;
- → Block C, Core A: a 225mm (or 22.5cm) extension in footprint to the north and north-east and a 112.5mm (or 11.25cm) extension to the east;
- → Block C, Core C: an infill of the recessed part of the façade to the south-east;
- → Block D, Core B: a 225mm (or 22.5cm) extension to the north and north-west.

1.2.2 The extensions in footprint have been accommodated to facades facing into the central landscaped area of the Site. There are no extensions in footprint proposed to the façades facing the site boundaries and, as such, there are no reductions in the distance of the proposed buildings to neighbouring residential receptors.

1.2.3 The footprint extensions have led to minor changes to the elevations of the affected blocks. The total floorspace of the proposed development has increased by 2,037.2 sqm (GIA). The number of homes and mix of unit types remains unchanged.

1.2.4 This latest Addendum to the Transport Assessment (TA Addendum) has been prepared following continued liaison with the London Borough of Richmond upon Thames Council (LBRuT), the Greater London Authority (GLA) and Transport for London (TfL) and a specific request that the baseline data relied upon in the preparation of supporting Transport Assessments and Travel Plans remains fit for purpose.

1.2.5 Within this TA Addendum several references are made to a previous document, the Transport Assessment Addendum referenced 300025-001-04 dated November 2021 (TAA 2021). For clarity and ease of reference a copy of this report is attached at **Appendix A**.

1.2.6 This Addendum report seeks to demonstrate that the site remains an accessible location for the proposed development and that an appropriate level of service is available to serve future residents whilst not impacting on those services to the detriment of existing residents.

1.2.7 Despite changes to bus and rail services during the period the development has been in the planning system the site remains at PTAL level 5. The forecast is that this level will be maintained in 2031. The forecast PTAL report is attached at **Appendix B**.

1.2.8 The opportunity will also be taken to consider the development proposals against more recent policies and initiatives that have been developed such as the Women's Night Safety Charter.

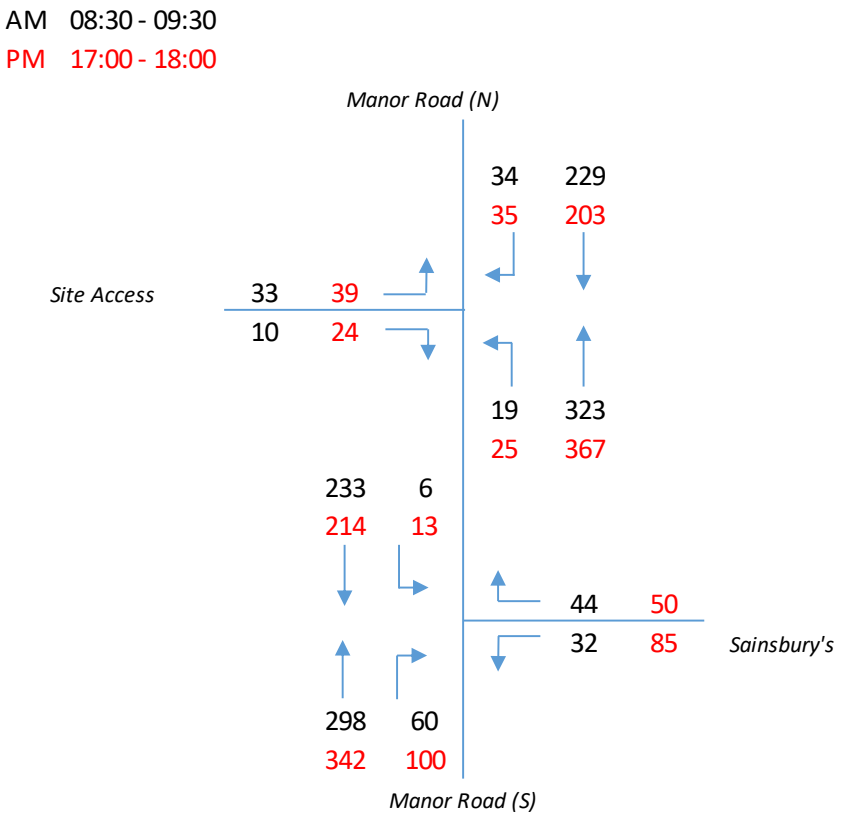
2. Validity of Baseline Data

2.1 Traffic Data

2.1.1 Fully classified traffic counts at both the site access and the access to the Sainsbury's store opposite were undertaken by Nationwide Data Collection Ltd on 2 October 2018 as part of the original application. The AM and PM peak hours were shown to be 08:30-09:30 and 17:00-18:00, the full report is included at Appendix A of TAA 2021.

2.1.2 The recorded vehicle movements at the junctions in the peak hours are shown on **Figure 1** below:-

Figure 1 – Recorded peak hour vehicle movements 2018



2.1.3 The peak hour vehicle movements at the existing site access were recorded as shown in **Table 1,** below:

Table 1 – Existing total vehicle movements at the site access 2018

	Arrivals	Departures	Total
AM Peak	53	43	96
PM Peak	60	63	123

2.1.4 However, it should be noted that the recorded traffic flows included a number of passenger service vehicle movements associated with the bus terminus which will continue to occur post-development. Therefore, the number of light vehicles was extracted in order to show the number of vehicle movements associated with the Homebase part of the development site in its existing use which would cease to occur. The results of this are shown in **Table 2**, below:-

Table 2 – Existing light vehicle movements at the site access 2018

	Arrivals	Departures	Total
AM Peak	46	33	79
PM Peak	52	55	107

Current and Proposed Situation

2.1.5 It is acknowledged that the Homebase Store is now closed although it is understood that it is currently occupied by a second-hand furniture retailer.

2.1.6 Nevertheless the comparison of existing or even former traffic generations to and from the site and the proposed development is not considered to be appropriate given that the development is proposed to operate on a "car-free" basis.

2.1.7 The development is to be "car-free" with no standard car parking spaces provided. 14 Nº car parking spaces (3% provision) are proposed within the site and these are all designated as accessible spaces. The potential to increase to the full 10% provision has been assessed and full details of this are available in the Landscape Addendum (July 2020) prepared by Gillespies (see sections 1.7 and 1.8 of the Landscape Addendum report).

2.1.8 In addition to the above, two electric car club spaces are to be provided on site. Car Clubs are widely accessible and provide users with access to a vehicle, without the need to own one themselves. They will be managed by the operators of the scheme who are to be confirmed in due course with the provision to be secured via a S106 obligation.

2.1.9 Space is also be proposed within the site to provide parking for servicing and delivery vehicles. It is expected that such vehicles will visit the site on a daily basis. However, in terms of deliveries from online suppliers and courier firms it is noted that these are generally co-ordinated by the courier in order to optimise deliveries and to minimise vehicle trips. Therefore it could be expected that multiple deliveries to the site from online sources would be combined to minimise vehicle trips.

2.1.10 Regular servicing of the development such as refuse collection will take place and the site layout is designed to accommodate these vehicles.

2.1.11 In terms of the vehicle trips that servicing and delivery vehicles would make to the site it is not considered that these would increase traffic levels on Manor Road or other sections of the highway network in the vicinity of the site as such vehicles would already be on the network servicing or making deliveries to existing residential properties in the area.

2.1.12 The proposed development will, therefore, generate minimal vehicle trips in both the AM and PM peak hours and on a daily basis. The predicted level of vehicle trips would be less than those previously recorded arising from the operational Homebase site. The impact on traffic flows as a result of the development has previously been considered by both TfL and LBRuT and has been found to be acceptable. This position has not changed.

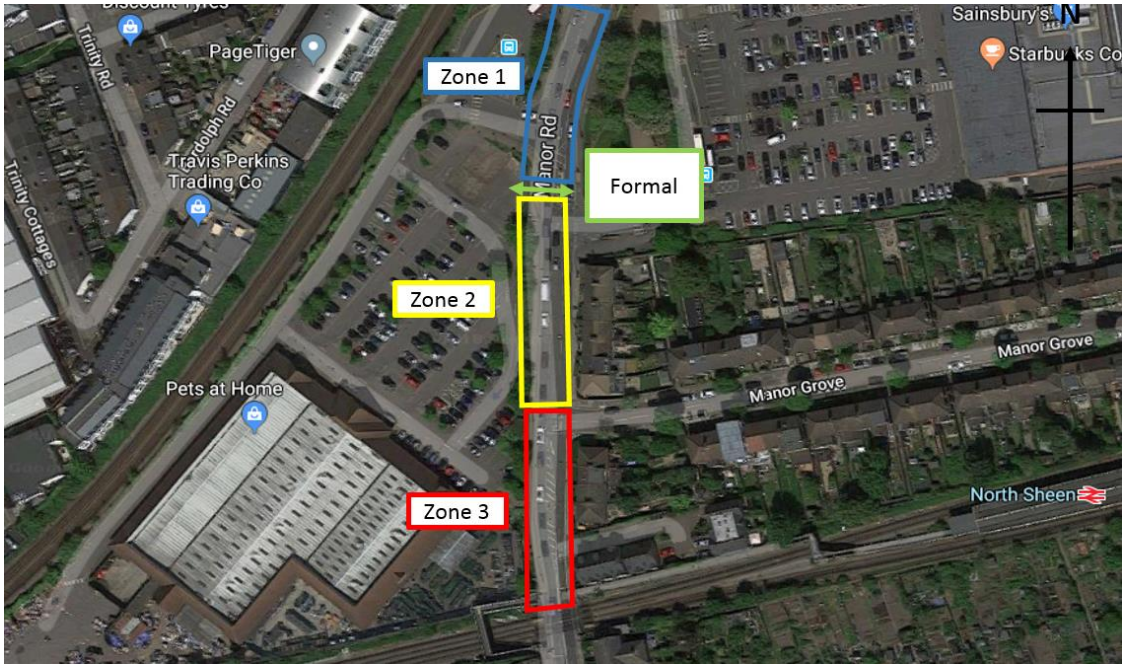
2.1.13 If it were the case that traffic flows have increased in the intervening period this would only serve to lessen the minimal impact that the vehicle trips predicted to occur as a result of the development would have on the operation of the highway network.

2.1.14 It is, therefore, concluded that it is not necessary to undertake new traffic surveys as the potential results of such surveys would be irrelevant as they would not alter the "with development" position.

2.2 Pedestrian Data

2.2.1 As part of the original TA, pedestrian surveys were undertaken identifying crossing movements along Manor Road. The study area and zones are illustrated in Figure 3, below:-

Figure 3 – Pedestrian Survey Study Area



2.2.2 The results of the pedestrian survey are set out in **Tables 3** and **4**, overleaf:-

Table 3 – AM Pedestrian Survey Results 2018

TIME	Zone 1		Formal Crossing		Zone 2		Zone 3	
	EB	WB	EB	WB	EB	WB	EB	WB
07:30	5	1	1	5	0	4	16	9
07:45	5	1	3	2	1	5	29	30
08:00	0	1	1	2	1	14	17	34
08:15	0	2	0	6	3	1	19	27
08:30	3	2	4	4	2	8	14	61
08:45	2	1	3	1	4	3	20	19
09:00	2	2	3	3	3	3	39	6
09:15	3	3	2	0	2	5	10	1
P/TOT	**20**	**13**	**17**	**23**	**16**	**43**	**164**	**187**

Table 4 – PM Pedestrian Survey Results 2018

TIME	Zone 1		Formal Crossing		Zone 2		Zone 3	
	EB	WB	EB	WB	EB	WB	EB	WB
15:00	5	4	1	4	5	4	17	17
15:15	3	4	17	6	1	3	22	9
15:30	2	2	9	4	5	6	25	2
15:45	1	0	5	2	4	9	21	11
16:00	6	6	5	1	6	2	11	12
16:15	2	3	8	6	1	2	19	9
16:30	6	3	15	5	1	1	16	10
16:45	2	4	5	1	4	4	19	13
17:00	3	1	3	0	4	2	9	5
17:15	2	1	4	3	1	2	12	7
17:30	1	5	1	3	1	3	7	16
17:45	8	2	2	2	5	8	15	10
P/TOT	**41**	**35**	**75**	**37**	**38**	**46**	**193**	**121**

2.2.3 The survey results identify that during both the AM and PM survey periods, there were significant levels of pedestrian activity. The pedestrian peak hours were 07:45 – 08:45 during which time a total of 302 crossings occurred, and 15:00 – 16:00 during which time a total of 230 crossings occurred. Over the course of the entire AM and PM survey periods, a total of 1,069 crossing movements were recorded.

2.2.4 What is also notable from the survey results is that more people were recorded crossing the road not at a crossing, than those recorded using a crossing. This would suggest that pedestrians typically have the opportunity to cross the full carriageway in one stage, rather than requiring refuge.

2.2.5 Based on the predicted level of pedestrian movements generated by the development set out in Section 9.13 of TAA 2021, the number of additional crossing movements along Manor Road equates to 800 movements daily.

2.2.6 It is not envisaged that pedestrian activity will have significantly increased in the intervening period since the original surveys were undertaken. It is to be expected that the majority of pedestrian movements recorded during the 2018 traffic surveys would have been education related trips, which are likely to have remained stable, and commuting related trips which are likely to have reduced as rail passenger numbers have yet to return to pre-pandemic levels.

2.2.7 It is also necessary to consider the on-going impact of the Covid-19 pandemic which may have increased the prevalence of home working and hence reduced the number of commuting trips that take place on a daily basis.

2.2.8 It is, therefore, considered that the 2018 pedestrian survey data is robust and remains fit for purpose and that it is not appropriate or necessary to undertake further surveys.

2.3 Level Crossing

2.3.1 As part of the October 2018 traffic surveys, Nationwide Data Collection Ltd undertook surveys of the activations of the level crossing and the associated queues that formed.

2.3.2 In the AM peak hour, the level crossing was activated 9 times resulting in the barrier being down for 37m 28s. In the PM peak hour this was 30m 38s over 11 activations.

2.3.3 In the AM, the average southbound queue caused by the barrier being down was 128 metres which extends to the site access junction. In the PM, the average queue was 83 metres which extends to a point between Manor Grove and Sainsbury's access.

2.3.4 Having reviewed current rail service levels through North Sheen station it is not considered that any significant changes have been implemented that would increase the frequency of the barriers being activated or the resultant queues.

2.3.5 Traffic generated by the development is considered to be minimal and would not in itself contribute to the queues arising from the use of the level crossing.

2.3.6 With the exception of residents with mobility issues the majority of pedestrian trips arising from the proposed development would not be impacted by the level crossing. Those heading north towards Manor Circus would not be impacted by the level crossing at all and neither would those accessing North Sheen station as the access to the station is on the development side of the level crossing. Pedestrians heading south along Manor Road would be able to utilise the over bridge to continue their journey when the barriers were activated.

2.3.7 A similar scenario would occur in relation to cycle trips with the exception of those cyclist's wishing to head south along Manor Road who may encounter some difficulty negotiating the overbridge.

2.4 Parking Stress Survey

2.4.1 In line with the agreed Transport Scoping Study a Parking Stress Survey was commissioned to establish the current parking restrictions and controls in force and also to identify the level of on-street parking which takes place.

2.4.2 Alpha Parking Limited undertook the surveys between 01:00-05:30, 09:00-10:00 and 13:00-14:00 on Monday 12 and Tuesday 13 November 2018 and a copy of the final report is attached at Appendix B of TAA 2021.

2.4.3 The overall conclusion of this report is that both day (AM and PM) and overnight parking stress levels are between 62% and 63%.

2.4.4 It is considered possible that the levels of parking stress may have increased as a result of the Covid-19 pandemic which may have increased the prevalence of home working and hence the presence of more cars during the daytime period.

2.4.5 However, it should be noted that in line with the policies of TfL and LBRuT, residents of the proposed development will be restricted from applying for residents parking permits for those roads in the vicinity of the site subject to such restrictions. This will be secured by way of a planning obligation.

2.4.6 This is supplemented by an agreed financial contribution of £50,000.00 to support a controlled parking zone (CPZ) study to establish if any of these need to amended, extended or new CPZ's introduced. A further £50,000.00 is also to be provided (conditionally) should amendments be deemed necessary. This is to be secured by way of a planning obligation.

2.5 Pedestrian Activity Survey at North Sheen Station

2.5.1 In order to be able to consider this in greater detail and to enable a development impact assessment to be undertaken a survey was undertaken on three neutral weekdays, Tuesday 8, Wednesday 9 and Thursday 10 October 2019 between the hours of 07:00-09:30 and 15:00-18:00. Unfortunately, due to a camera failure data was not recorded after 09:20 on Thursday 10. However, a further survey was subsequently undertaken on Thursday 24 October 2019 to obtain additional data for analysis.

2.5.2 The full results of the surveys are presented at Appendix C of TAA 2021 and summarised in **Table 5** overleaf with the numbers in brackets representing cyclists:-

Table 5 – Summary of pedestrian activity at North Sheen Station

Time Period	Tuesday 08/10/19		Wednesday 09/10/19		Thursday 10/10/19		Thursday 24/10/19	
	In	Out	In	Out	In	Out	In	Out
07:00 – 07:30	99	31	93	25 (1)	90	25 (1)	73	23
07:30 – 08:00	160	31 (1)	129	28 (1)	138	36 (1)	111	27 (2)
08:00 – 08:30	130	51	124	38	114	35	141	47
08:30 – 09:00	81	21	73	24	73	30	75	30
09:00 – 09:30	49	11	58	19			58	15
AM Total	519	145 (1)	477	134 (2)			458	142 (2)
15:00 – 15:30	24	24	27	17 (1)			23	27
15:30 – 16:00	12	18	42 (1)	27			24	21
16:00 – 16:30	27	50	24 (1)	31			28	18
16:30 – 17:00	33	55	31 (6)	46 (1)			23	58
17:00 – 17:30	42 (1)	56 (1)	23 (2)	44 (1)			44 (1)	53
17:30 – 18:00	23	73	31 (2)	95 (3)			30 (1)	80
18:00 – 18:30	32	54	30 (1)	42			27	36
PM Total	193 (1)	330 (1)	208 (13)	302 (6)			199 (2)	293

2.5.3 Further analysis of the impact of the development on North Sheen station is provided in Section 6 of this report which provides an update of the number of visitors to the station is compared to the frequency of trains typically stopping at North Sheen Station during these peak periods.

2.6 Personal Injury Accident Data

2.6.1 The various Transport Assessment reports which have been prepared in support of the proposed development have all provided a review of personal injury accident data on the local highway network. The most recent update to this was presented in the TAA 2021 which covered an extended 7 year period up to 31st December 2019. This consisted of 5 years data (to December 2017) from TfL and an additional 2 years data from the on-line resource Crashmap.

2.6.2 In order to provide an up to date review of personal injury accidents in the immediate vicinity of the development site the Crashmap database has once again been interrogated to identify all recorded incidents within the last 5 year period available which extends to 31 December 2022. The same study area has been examined and **Figure 2** below shows the location and severity of each incident recorded during this period:-

Figure 2 – Crashmap Accident Data Plot (5 years to December 2021)

2.6.3 The Crashmap database identifies that there have been a total of 17 incidents recorded within the latest 5 year period; of which 2 were classified as being serious in severity and the remaining 15 were slight in severity.

2.6.4 In terms of location, 2 (both slight) incidents took place along Manor Road in proximity to the development site frontage, whilst the remaining incidents (13 slight, 2 serious) all occurred at or in close proximity to the Manor Circus roundabout junction.

2.6.5 In terms of type, 4 incidents (all 'slight') involved pedestrian casualties, 5 incidents (3 'slight', 2 'serious') involved cyclists, 6 incidents (all slight) involved motorcyclists and the remaining 2 incidents were collisions between two vehicles.

2.6.6 It is noteworthy that 4 of the incidents involving pedestrians, all of which took place at or in close proximity to the Manor Circus roundabout, occurred as the pedestrian was using one of the existing zebra crossing facilities.

2.6.7 Based on the above, it is considered that the accident history on the local highway network has not worsened since the original assessments were undertaken. However, it is considered that the implementation of the proposed improvements at the Manor Circus roundabout will assist in reducing the number of pedestrian and cyclist incidents that have been recorded in recent years. The introduction of signal controlled Toucan crossings and widened areas off carriageway for pedestrians and cyclists will provide a safer environment for these vulnerable road users.

2.7 Summary

2.7.1 In summary it is acknowledged that some time has passed since the original survey data was obtained. However, a review of that data alongside an assessment of the current position, including consideration of the on-going impacts of the Covid-19 pandemic, has demonstrated that it remains fit for purpose.

2.7.2 We still have confidence in the data previously obtained and consider it to be an appropriate baseline upon which to assess the transport impacts of the development. It is, therefore, considered that updating the surveys would not have a meaningful impact on the findings of the Transport Assessment.

3. Impact of the Development on the Pedestrian Network

3.1.1 In Section 9 of the TAA 2021 an assessment was undertaken to establish the impact of the proposed development on the pedestrian network. Pedestrian trips were estimated to be in the order of 34 pedestrian trips (two-way) in AM peak, 27 pedestrian trips (two-way) in the PM peak hour and 317 trips (two-way) daily.

3.1.2 Further to the above, those utilising public transport modes are expected to generate an additional pedestrian demand in the order of 188 trips (two-way) in the AM, 145 trips in the PM and 1,733 trips (two-way) daily. These journeys on foot would be limited to between the development site and local bus stops / North Sheen Station.

3.1.3 Section 9 of the TAA went on to examine the various pedestrian journey purposes such as education, travel to work, shopping etc. and set out the potential routes pedestrians would take during these journeys and the suitability of the pedestrian infrastructure currently in place.

3.1.4 Whilst it is acknowledged that the proposed development will give rise to an increase in pedestrian activity in the immediate area it is still considered that these can safely be accommodated within the proposed highway network.

3.1.5 The development proposals comprise improvements to the pedestrian environment including an upgrade to the pedestrian crossing immediately north of the level crossing and by the creation of a wider footway area along the site frontage itself. These will not only benefit residents of the development but also existing pedestrians as well who use this area to access North sheen Station and to travel to local schools and other amenities to the south of the level crossing.

3.1.6 The highway improvement works to the Manor Circus roundabout will also provide significant betterment to the facilities for pedestrian particularly by way of signal controlled Toucan crossings and wider footway areas which will improve pedestrian comfort levels.

4. Impact of the Development on the Cycle Network

4.1 In Table 13 of TAA 2021 multi modal trip generations, using the TfL methodology, are set out. This predicts that the proposed development would give rise to a total of 217 two-way cycle trips on a daily basis with 24 two-way trips taking place in the AM peak period and 18 two-way trips in the corresponding PM peak period.

4.1.1 It is considered that these movements can be satisfactorily accommodated within the exiting/proposed highway network.

4.1.2 The development proposals include provision of cycle parking within each residential block and in communal areas for visitors and customer of the proposed commercial units to encourage cycling as a mode of transport in line with The London Plan and the Mayor's Transport Strategy.

4.1.3 The highway improvement works to the Manor Circus roundabout will also provide significant betterment to the facilities for cyclists particularly by way of signal controlled Toucan crossings and wider footway areas which will enhance cyclist provision.

5. Impact of the Development on Local Bus Services

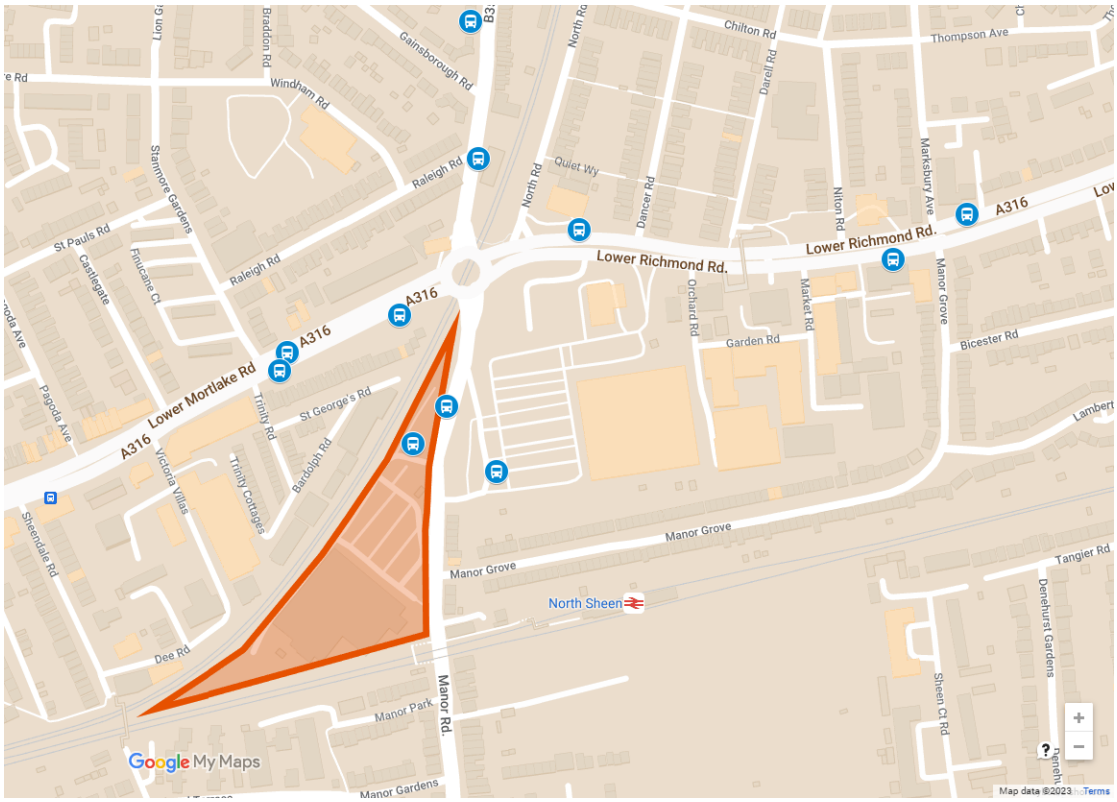
5.1 Within the TAA 2021 a detailed assessment was made as to the impact of the development on local bus services (Section 10 of the aforementioned TAA 2021 refers). This assessment was based on the multi modal trip generation methodology which was requested by TfL and included an adjustment for all underground trips to be initially made by bus.

5.2 Based on this assessment methodology, it was identified (in Table 13 of TAA 2021) that the additional demand for buses which could potentially be generated by the proposed development equates to around 116 people in the AM peak period, 90 people in the PM peak period and 1,072 people daily. These figures include all those using a bus to access Richmond Underground Station.

5.3 The above estimate is considered robust because (as noted by the Council) there are schools (primary and secondary) and higher education establishments within acceptable walking distance of the site. As such, pupils are unlikely to be dependent upon bus services to access education. Furthermore, the site is located immediately adjacent a supermarket (with Pharmacy); therefore journeys for the purposes of shopping are unlikely to require access to bus services.

5.3.1 The closest bus stops to the site are located on Manor Road approximately 170-180m from the site. In addition, bus stops are located on Lower Mortlake Road, Lower Richmond Road and Sandycombe Road slightly further from the site. The location of these bus stops is shown in **Figure 4** below.

Figure 4 – Location of the nearest bus stops ***[GoogleMyMaps]***



5.3.2 The services available from these stops and their frequencies are show in **Table 6** below:-

Table 6 – Summary of bus services

Number	Route	Approximate Peak Frequency		
		Mon – Sat Daytime	Mon- Sat Evening	Sunday
110	Hammersmith – Richmond – Hounslow	15 mins	20 mins	30 mins
190	Richmond – Twickenham – Hampton Hill	15 mins	20 mins	20 mins
371	Kingston-upon-Thames – Richmond	9 mins	10-15 mins	12 mins
419	Roehampton – North Sheen – Richmond	12 mins	20 mins	20 mins
H37	Richmond – Hounslow	8 mins	11 mins	10 mins
N22	Fulham – Richmond – Twickenham (Night bus)	No Service	30 mins	30 mins
R68	Brentford – Twickenham – Molesey	15-20 mins	15 mins	15 mins
R70	Richmond – Twickenham – Hampton Hill	8 mins	15 mins	20 mins

5.3.3 Given the anticipated increase in demand (116 people in the AM peak period, 90 people in the PM peak period and 1,072 people daily) and the number of available bus services per hour (35), the number of additional people using each service would likely be modest; in the order of 3 people. This is considered unlikely to have a material adverse effect on existing bus capacity.

5.3.4 It is noted that, with the current services in place, TfL remain satisfied that there is sufficient spare capacity on the bus network to accommodate the uplift in bus demand generated by the development.

5.3.5 It should also be noted that no allowance is being made for the longer term impacts of the COVID-19 pandemic in terms of the increased percentage of people choosing to work from home.

6. Impact of the Development on Rail Services

6.1 North Sheen is the closest rail station to the site and is situated approximately 180m to the east of the site and is managed by South Western Railway. This provides travel from London Waterloo through to Reading, with stops such as Richmond, Clapham Junction, Ascot, Twickenham and Ashford.

6.2 A summary of the current services to and from North Sheen station and their frequency in the peak hour periods is shown in **Table 7** below.

Table 7 – Direct Rail services to and from North Sheen

Destination	Approximate Peak Hour Frequency	
	07:30-08:30	17:00-18:00
North Sheen – London Waterloo	5-20 mins	3-20 mins
London Waterloo – North Sheen	10 mins	20 mins
North Sheen – Richmond	15 mins	15 mins
Richmond – North Sheen	15 mins	15 mins

6.3 As such, it is considered the vast majority of rail users generated by the development will access the rail network via North Sheen Station.

6.4 It should, however, be noted that Richmond Station is also considered to be accessible to the future residents of the development. Bus services R70 and 371 from Manor Road both provide a connection to Richmond Station with frequent services (better than every 10 mins) available during the peak hours. The journey time is typically 4 minutes. From Richmond Station a much wider range of services and destinations is available to passengers.

6.5 Richmond Station is also accessible by cycle with a typical journey of 5 minutes. This cycle journey will be enhanced in the future following the completion of the Manor Circus Improvement scheme which is due to commence in the near future. The works will provide widening to footways and cycleways to provide more space for pedestrians and cyclists. Signal controlled Toucan crossings are also proposed to all arms of the roundabout which will replace the existing zebra crossings.

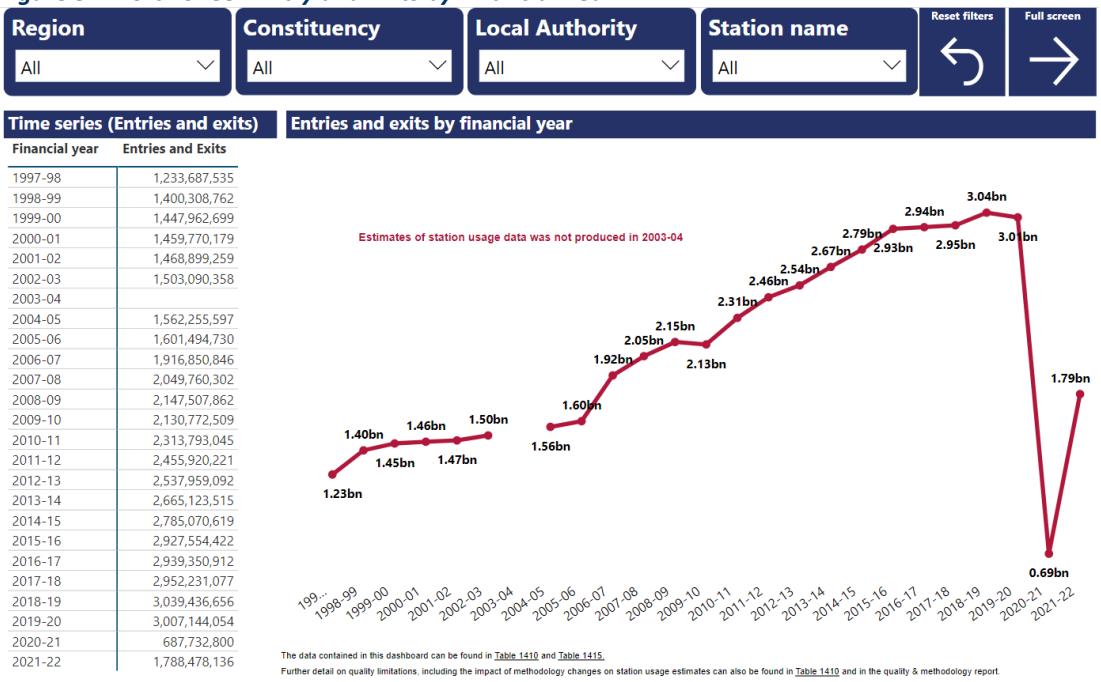
6.6 During the consideration of application 19/0510/FUL, the 'Original Proposed Development', the matters of potential platform congestion and the availability of space on trains to London, particularly during the AM peak were raised.

6.7 In order to be able to consider this in greater detail and to enable a development impact assessment to be undertaken, surveys were undertaken at North Sheen Station on three neutral weekdays; Tuesday 8, Wednesday 9 and Thursday 10 October 2019 between the hours of 07:00-09:30 and 15:00-18:00. Due to camera failure during the 10 October survey Thursday 24 October was surveyed for comparison.

6.8 The results of the surveys (detailed in Section 3.6 and attached at Appendix C of TA Addendum 300025-001-04 – November 2021) revealed that on a typical neutral weekday the morning "peak" occurs between 07:30 and 08:30 when an average of 262 passengers enter the station.

6.9 In order to consider these survey results against more recent data information published by the Office of Road and Rail has been interrogated to compare current levels of patronage at the station https://dataportal.orr.gov.uk/statistics/usage/estimates-of-station-usage The results for North Sheen Station are set out in **Figure 5** below:-

Figure 5 – North Sheen Entry and Exits by Financial Year



6.10 As would be expected the impact of the COVID-19 pandemic was significant on rail use although passenger numbers have begun to rise. The next dataset is due to be published in November 2023 when it is expected that patronage will increase further although not to pre-pandemic levels. It is, therefore, considered that the 2019 survey results represent a robust baseline.

6.11 As there is only a single point of entry linking to a central platform it is not known for certain which direction passengers are intending to travel in. However, it is noted that trains from North Sheen towards central London (Waterloo) are available on both west and east bound lines with varying journey times and number of stops.

6.12 Taking into account recent changes in services in this AM "peak" period 8 trains are scheduled to stop at North Sheen which provide access to London Waterloo and varying station en-route. Some trains provide an option to change at Richmond to catch a faster onward train.

6.13 It is, therefore, considered that typically these 8 services would need to be able to accommodate, on average 33 passengers each. Bearing in mind that the South Western Rail trains on this line usually operate between 8 and 10 carriages during peak times this is not considered to be unreasonable.

6.14 Based on the TfL trip generation methodology it was identified (in Table 13 of TAA 2021) that the additional demand for rail services which could potentially be generated by the proposed development equates to around 72 people in the AM peak period, 55 people in the PM peak period and 661 people daily.

6.15 Based on the above, it is considered the development could result in an increase of circa 7 – 9 people per service, or an additional 1 person per carriage, during the peak periods.

6.16 It is considered that this level of increase would not have a material impact on the capacity of local rail services and in reality the additional demand would not be discernible amongst typical daily fluctuations.

6.17 From analysis of the pedestrian survey which recorded activity at the entrance/exit at North Sheen Station it is considered that existing rail passengers can be accommodated on peak hour services. Further analysis of the predicted uplift, as a result of the proposed development, also indicates that the station and attending trains will be able to accommodate future passenger levels during peak hours.

6.18 There have been recent rail improvements including the introduction of new trains which has increased the available capacity of the trains on key routes in south-west London. In addition, Network Rail has also improved/realigned the platforms at Waterloo Station which now means that all 24 platforms are able to be used for South Western train services thus increasing the available services and reliability.

7. Women's Night Safety Charter

7.1 As part of the Mayor's Tackling Violence Against Women and Girls Strategy the Women's Night Safety Charter (WNSC) has been developed. The WNSC sets out seven pledges that any organisations that operate at night can sign-up. These are set out below.

- → nominate a champion in your organisation who actively promotes women's night safety
- → demonstrate to staff and customers that your organisation takes women's safety at night seriously, for example through a communications campaign
- → remind customers and staff that London is safe, but tell them what to do if they experience harassment when working, going out or travelling
- → encourage reporting by victims and bystanders as part of your communications campaign
- → train staff to ensure that all women who report are believed
- → train staff to ensure that all reports are recorded and responded to
- → design your public spaces and work places to make them safer for women at night.

7.2 Although it is not known at this stage whether any of the proposed commercial units will operate at night the WNSC is considered an important factor which should be taken into account when designing the communal areas of the development to ensure the safety of its residents and visitors.

7.3 It is considered that the external areas of the development site have been designed to an appropriate standard maximising natural surveillance and minimising isolated areas. Walkways within the site and along the Manor Road frontage will be lit and CCTV will be provided where necessary.

7.4 Further information on the WNSC can be found at:-

https://www.london.gov.uk/programmes-strategies/arts-and-culture/24-hour-london/womens-night-safety-charter

8. Contributions to Highway and Sustainable Travel Improvements

8.1 It was previously agreed that the propsed development would contribute £380,000.00 towards the improvements to the Manor Circus Roundabout on the basis that the development would increase activity by both pedestrians and cyclists through this junction.

8.2 However, the improvement scheme is to commence imminently independently of any financial contribution from the proposed development at Manor Road. It is, therefore, proposed that a similar level of contribution would be made towards improvements at North Sheen Station.

8.3 Initially the contribution would enable a study to take place identifying potential improvements and then contribute to their implementation.

8.4 During the various public consultations that took place during the early stages of the project several local residents raised concerns with regards to the passenger facilities at North Sheen. Currently there are no passenger lifts at the station and as the platform sits centrally between the east and west bound tacks all passengers have to use the stepped access route to negotiate the overbridge. It is also noted that this route is uncovered and that lighting is in need of review and potential upgrade.

8.5 Preceding sections of this TA Addendum reassess the various baseline datasets which were undertaken in 2018/2019 and upon which all Transport Assessments have been based. Notwithstanding the fact that this reassessment concludes that the data is still relevant, that the impact of the proposed development will not be severe and that all modes can be satisfactorily accommodated on the existing/proposed highway network it is considered appropriate to provide a Sustainable Travel Implementation Fund.

8.6 This would ensure that there is the flexibility to respond to any uncertainty generated by the longer term impacts of the COVID-19 pandemic on residents travel patterns as well changes to servicing and delivery trends such as an increased use of cycles and motorcycles. It will also assist in addressing the concerns of local residents in relation to the impact of the Hammersmith Bridge closure and the implementation of ULEZ.

8.7 Such a fund will ensure that the development achieves the strategic mode share targets set out in the London Plan and the Mayor's Transport Strategy which, for Outer London areas, is 75% for walking, cycling and public transport.

8.8 The on-going mode share of the development will be monitored through the implementation of the Residential and Commercial Travel Plans in conjunction with TfL and LBRuT. If the expected mode share targets are not being met the Sustainable Travel Implementation Fund will be used to promote improvements or initiatives aimed at increasing the mode share in question.

8.9 Although the development is already committed to a number of contributions through earlier discussion with TfL and LBRuT, further initiatives have been identified for future consideration:-

- → Cycle infrastructure review and implementation. This could include physical infrastructure such as the provision of a cycle wheeling ramp on the overbridge at North Sheen station as well as softer measures such as training.
- → Pedestrian infrastructure review and implementation. This could include the installation of additional uncontrolled pedestrian crossing points along Manor Road and a review of dropped kerb and tactile paving provision on routes towards local schools and other facilities.

8.10 It is proposed that this Fund will be covered in the detailed final versions of the Residential and Commercial Travel Plans that will be required to be submitted prior to the occupation of the development. It is expected that the submission and approval of the detailed final versions of the Travel Plans will be secured, monitored, reviewed and enforced through the S106 agreement.

Appendix A

Transport Assessment Addendum – 300025-001-04 November 2021

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Prepared on behalf of

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Proposed Change of Use Development off Manor Road, Richmond

Transport Assessment Addendum

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Control Sheet

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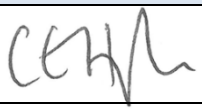
	Prepared by	Carly Hoyle		16/04/2021
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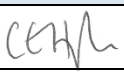
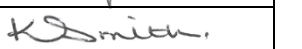
	02	27/04/2021	Final	Amended to include revised tenure mix	By	
					Check	
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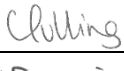
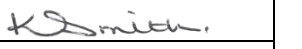
	03	27/09/2021	Final	Amended to address SWR Timetable Consultation	By	
					Check	
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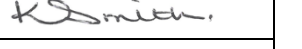
					Check	
					Approve	

This document has been prepared in accordance with procedure OP/P02 of the *Fairhurst Quality and Environmental Management System*

This document has been prepared in accordance with the instructions of the client, Avanton Richmond Development Ltd, for the client's sole and specific use. Any other persons who use any information contained herein do so at their own risk.

Acknowledgements:

The National Geographic Society MapMaker tool has been used to generate figures included in this report.

Imagery from ©Google has been included in this report for illustrative purposes only.

Accident information has been obtained from www.crashmap.co.uk and Transport for London (TfL).

An extract of TfL's Local Cycling Guide 9 has been included in this report.

Census 2011 data has been used to predict modal split.

Disclaimer

The methodology adopted and the sources of information used by Sanderson Associates (Consulting Engineers) Ltd in providing its services are outlined within this Report.

Any information provided by third parties and referred to herein has not been checked or verified by Sanderson Associates (Consulting Engineers) Ltd, unless otherwise expressly stated within this report.

This report was checked and approved on the 15 November 2021 and the Report is therefore valid on this date, circumstances, regulations and professional standards do change which could subsequently affect the validity of this Report.

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Executive Summary

This Transport Assessment Addendum has been prepared by Sanderson Associates (Consulting Engineers) Ltd on behalf of Avanton Richmond Development Ltd ('the Applicant') in relation to the proposed scheme for the redevelopment of the Homebase store at 84 Manor Road, North Sheen ('the Site').

A Revised Transport Assessment, dated June 2020, provided an assessment of the Amended Proposed Development and considered the impact of the amended proposals in comparison to the Original Proposed Development.

An Addendum report was prepared in April 2021 following the formal adoption of the updated London Plan in March 2021 and bring up-to-date specific sections of the report accordingly. It also recognised changes in TfL bus services and the impact these changes had on the PTAL rating of the site.

The Addendum report prepared in September 2021 was to address South Western Railway's Timetable Consultation, which is intended to come into effect in December 2022, and assess whether the proposed changes will impact the PTAL rating of the site.

This current Addendum report is submitted in order to reflect the changes that have been made to the layout of the site due to an amendment to the red line boundary.

The development will positively influence travel behaviour at the site by incorporating facilities to encourage sustainable trip movements and ensuring easy, convenient access to sustainable travel options. Travel Plans have been developed for the site which sets out the strategy and initiatives that will be adopted in order to encourage the use of sustainable modes of travel.

The impact of the residual trips from the proposed development have been assessed through detailed capacity analysis using junction performance modelling techniques and proportional impact assessment.

The development supports the transport objectives of National and Local Planning Policy.

The proposed development remains acceptable in transport planning terms, suitable access for all people can be achieved, and there will be no significant transport impacts as a result of the proposed development as the scheme will result in a reduction of traffic compared to the existing use.

1 Introduction

1.1 This Transport Assessment Addendum has been prepared by Sanderson Associates (Consulting Engineers) Ltd on behalf of Avanton Richmond Development Ltd ('the Applicant') to address South Western Railway's Timetable Consultation and assess whether the proposed changes will impact the PTAL rating of the site (84 Manor Road, North Sheen).

1.2 A planning application for the redevelopment of the Site was submitted to London Borough of Richmond upon Thames (LBRuT) in February 2019 (ref. 19/0510/FUL) (the 'Original Proposed Development'), and was considered at LBRuT Planning Committee on 3 July 2019. The Planning Committee resolved that they were minded to refuse the Application, however on 29 July 2019 it was confirmed that the Mayor of London would act as the local planning authority for the purposes of determining the application.

1.3 Following review of LBRuT's reasons for refusal and discussions with Officers at the Greater London Authority (GLA) and Transport for London (TfL), the Applicant sought to review the scheme, with the principle aim of increasing the delivery of affordable housing through additional density and addressing other issues raised in the Mayor's Stage 2 Report. Initial scheme amendments were submitted in November 2019 ('the November 2019 Amendments') and increased the overall number of units by 48, primarily through the introduction of a new residential building known as Block E.

1.4 Following further discussions with TfL and the GLA, it was subsequently agreed that further revisions should be explored in order to deliver an improved scheme, without the need for this additional block.

1.5 The proposed changes are described in detail in the Design and Access Statement Addendum (July 2020), however, of particular note is the increase in residential units from 385 within the Original Proposed Development (Feb 2019 submission) to 453 within the Amended Proposed Development (July 2020 submission).

1.6 This increased the total number of affordable units by 39 to a total of 173 affordable homes (40% by habitable room taking account of grant funding, increased from 35% as originally submitted). This increase in units and the higher affordable housing provision was principally achieved through amendments to the height and internal layout in appropriate locations across the Site.

1.7 The June 2020 Revised Transport Assessment, therefore, provided an assessment of the Amended Proposed Development and considered the impact of the amended proposals in comparison to the Original Proposed Development. This addendum report retains all such references and analysis.

1.8 Travel Plans have been developed for the site which set out the strategies and initiatives that will be adopted in order to encourage the use of sustainable modes of travel associated with the development. This Transport Assessment Addendum should be considered in conjunction with the previously submitted Travel Plans.

2 Planning Policy Context

2.1 National Planning Policy

2.1.1 The latest National Planning Policy Framework (NPPF) was published in July 2021 and sets out the Government's planning policies for England and how these are expected to be applied.

2.1.2 At NPPF paragraph 38 it is stated that;

'Decision-makers at every level should seek to approve applications for sustainable development where possible.'

2.1.3 Paragraph 110 states that in assessing development applications;

'a) appropriate opportunities to promote sustainable transport modes can be – or have been – taken up, given the type of development and its location;

b) safe and suitable access to the site can be achieved for all users;

c) the design of streets, parking areas, other transport elements and the content of associated standards reflects current national guidance, including the National Design Guide and the National Model Design Code 46; and

d) any significant impacts from the development on the transport network (in terms of capacity and congestion), or on highway safety, can be cost effectively mitigated to an acceptable degree.'

2.1.4 NPPF Paragraphs 111 and 112 state that;

'Development should only be prevented or refused on highways grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network would be severe.

Within this context, applications for development should:

a) give priority first to pedestrian and cycle movements, both within the scheme and with neighbouring areas; and second – so far as possible – to facilitating access to high quality public transport, with layouts that maximise the catchment area for bus or other public transport services, and appropriate facilities that encourage public transport use;

b) *address the needs of people with disabilities and reduced mobility in relation to all modes of transport;*

c) *create places that are safe, secure and attractive – which minimise the scope for conflicts between pedestrians, cyclists and vehicles, avoid unnecessary street clutter, and respond to local character and design standards;*

d) *allow for the efficient delivery of goods, and access by service and emergency vehicles; and*

e) *be designed to enable charging of plug-in and other ultra-low emission vehicles in safe, accessible and convenient locations.'*

2.1.5 NPPF Paragraph 111 states that;

'All developments that will generate significant amounts of movement should be required to provide a travel plan, and the application should be supported by a transport statement or transport assessment so that the likely impacts of the proposal can be assessed.'

2.1.6 Travel Plans have been prepared in support of the residential and commercial proposals, and are submitted under separate covers.

2.2 National Planning Practice Guidance

2.2.1 The National Planning Practice Guidance (NPPG) brings together National Planning Policy Framework. It was launched in March 2014 and coincided with the cancelling of the majority of Government Circulars which had previously given guidance on many aspects of planning.

2.2.2 In relation to Transport NPPG provides the following guidance:

- *Transport evidence bases in plan making and decision taking* - March 2015
- *Travel Plans, Transport Assessments and Statements* - March 2015

2.2.3 NPPG *Transport evidence bases in plan making and decision taking* sets out the key issues that local planning authorities should consider in developing the transport base to support the Local Plan, including:

- assess the existing situation and likely generation of trips over time by all modes and the impact on the locality in economic, social and environmental terms;
- assess the opportunities to support a pattern of development that, where reasonable to do so, facilitates the use of sustainable modes of transport
- highlight and promote opportunities to reduce the need for travel where appropriate;
- identify opportunities to prioritise the use of alternative modes in both existing and new development locations if appropriate;
- consider the cumulative impacts of existing and proposed development on transport networks;
- assess the quality and capacity of transport infrastructure and its ability to meet forecast demands;
- identify the short, medium and long-term transport proposals across all modes.

2.2.4 NPPG *Travel Plans, Transport Assessments and Statements* sets out the key principles that should be taken into account in preparing a Travel Plan and Transport Assessment. NPPG states that Travel Plans and Transport Assessments are important as they can positively contribute to:

- encouraging sustainable travel;
- lessening traffic generation and its detrimental impacts;
- reducing carbon emissions and climate impacts;
- creating accessible, connected, inclusive communities;
- improving health outcomes and quality of life;
- improving road safety; and
- reducing the need for new development to increase existing road capacity or provide new roads.

2.3 London Plan Policies

2.3.1 The London Plan (March 2021), is "the overall strategic plan for London" and "sets out an integrated economic, environmental, transport and social framework for the development of London over the next 20–25 years". "The London Plan is legally part of each of London's Local Planning Authorities' Development Plan and must be taken into account when planning decisions are taken in any part of Greater London".

2.3.2 Key policies within the London Plan considered applicable to this development are set out below:-

- Policy T1 – Strategic approach to transport
- Policy T2 – Healthy Streets
- Policy T4 – Assessing and mitigating transport impacts
- Policy T5 – Cycling
- Policy T6 – Car Parking

2.4 Local Planning Policies

2.4.1 The Local Plan for LBRuT, adopted July 2018, sets out the key planning policies for the area for a 15 year period.

2.4.2 Policy LP 44 relates to Sustainable Travel Choices including cycling and walking, public transport and location of new developments and states that;

"The Council will work in partnership to promote safe, sustainable and accessible transport solutions, which minimise the impacts of development including in relation to congestion, air pollution and carbon dioxide emissions, and maximise opportunities including for health benefits and providing access to services, facilities and employment".

2.5 The Development in Planning Policy Context

2.5.1 This Transport Assessment demonstrates that the development is sustainable, can be accessed by all people and the residual cumulative traffic impact is not severe. The development is therefore in accordance with the transport principles set out in NPPF.

2.5.2 The planning application is supported by a Transport Assessment and Travel Plan in accordance with NPPF and NPPG.

2.5.3 The proposed car and cycle parking provisions are in accordance with the standards identified within the London Plan.

2.5.4 The development supports the general principles of sustainable transport set out within the Local Plan 2018 and does not conflict with the objectives of the Mayor's Transport Strategy.

3 Existing Situation

3.1 The Site and Surrounding Area

3.1.1 The development site is currently occupied by operational Homebase and Pets at Home stores with associated surface level parking. The site is bounded by active railway lines to both the North and the South of the site. The East of the site is bounded by Manor Road as can be seen in the figure below;

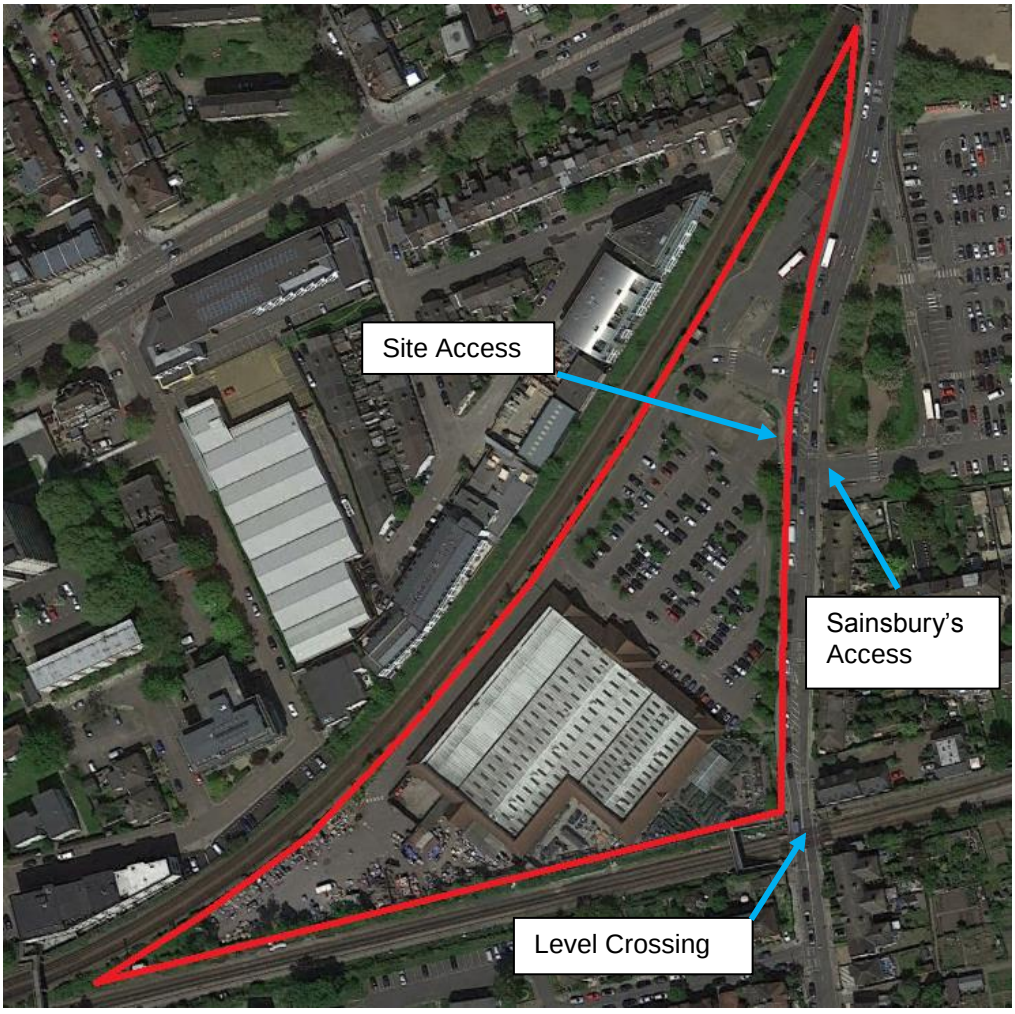


Figure 1 – Approximate extents of site ***© 2018 Google***

3.1.2 Vehicular access is taken from Manor Road in the form of a standard priority junction arrangement, the dimensions of which are able to accommodate heavy goods vehicles and buses. The initial section of the access road within the site also serves the North Sheen Bus Terminus, situated in the northern part of the site.

3.1.3 The existing car park provides a total of 174 spaces. However, 14 of these are occupied by a hand car wash & valeting service and 11 are reserved for use by Europcar Car Hire customers.

3.2 Existing Traffic Flows

3.2.1 Fully classified traffic counts at both the site access and the access to Sainsbury's opposite were undertaken by Nationwide Data Collection Ltd on 2nd October 2018 as part of the original application. The data obtained from the traffic surveys is considered to remain valid and provides a robust assessment of the proposals.

3.2.2 The AM and PM peak hours were shown to be 08:30-09:30 and 17:00-18:00, the full report is included at **Appendix A**.

3.2.3 The recorded vehicle movements at the junctions in the peak hours are shown on the diagram below;

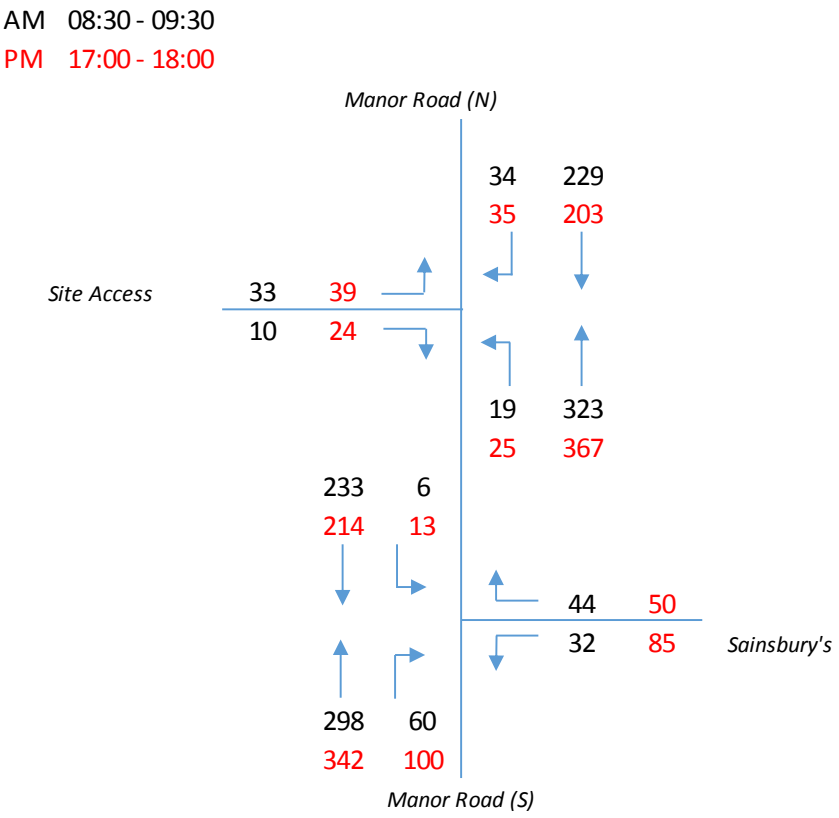


Figure 2 – Recorded peak hour vehicle movements

3.2.4 The peak hour vehicle movements at the existing site access were recorded as shown below:

	Arrivals	Departures	Total
AM Peak	53	43	96
PM Peak	60	63	123

Table 1 – Existing total vehicle movements at the site access

3.2.5 However, it should be noted that the recorded traffic flows include a number of passenger service vehicle movements associated with the bus terminus which will continue to occur post-development. Therefore, the number of light vehicles has been extracted in order to show the number of vehicle movements associated with the Homebase part of the development site in its existing use which will cease to occur. The results of this are shown below:

	Arrivals	Departures	Total
AM Peak	46	33	79
PM Peak	52	55	107

Table 2 – Existing light vehicle movements at the site access

3.3 Level Crossing

3.3.1 On Manor Road, adjacent to the southern boundary of the site, a level crossing is present, as indicated on Figure 1. On 2 October 2018, Nationwide Data Collection Ltd undertook surveys of the activations of the level crossing and the associated queues that formed.

3.3.2 In the AM peak hour, the level crossing was activated 9 times resulting in the barrier being down for 37m 28s. In the PM peak hour this was 30m 38s over 11 activations.

3.3.3 In the AM, the average southbound queue caused by the barrier being down was 128 metres which extends to the site access junction. In the PM, the average queue was 83 metres which extends to a point between Manor Grove and Sainsbury's access.

3.4 The Existing Highway Network

3.4.1 Manor Road, classified as the B353, runs in a north-south direction from Sheen Road (A305) in the south to the roundabout junction of Lower Richmond Road/Lower Mortlake Road (A316) and Sandycombe Road (B353) to the north.

3.4.2 Manor Road is a predominantly residential street and is generally a single carriageway with right turn lanes provided for access to both this site and the Sainsbury's supermarket opposite. It is subject to a 30mph speed limit and has double yellow line parking restrictions in place.

3.4.3 Along the site frontage there are two central islands which aid pedestrian movements, both have dropped kerbs and at the northern crossing tactile paving is also provided.

3.4.4 To the south of the site a stepped bridge is present to allow pedestrian movements to continue whilst the level crossing barriers are down as trains pass.

3.4.5 An assessment has been made of the walking routes from the site to the bus stops on Manor Road, Lower Mortlake Road and Lower Richmond Road.

3.4.6 Along Manor Road, street-lighting is provided on both flanks, as are footways that link to the wider network. On the western side, the footway width is approximately 2.5m leading to the bus stop and then gradually narrows to approximately 1.8m on the approach to the roundabout junction.

3.4.7 At the roundabout junction, all arms have controlled pedestrian crossings in the form of zebra crossings. To the west, on Lower Mortlake Road, is a segregated foot/cycle way providing access to the nearest bus stops.

3.4.8 Towards the eastbound bus stop on Lower Richmond Road, raised crossing points with a central island and tactile paving are provided to aid pedestrian crossings of North Road and also act as a traffic calming measure. From North Road, footways with a width of approximately 4m are present.

3.5 Parking Stress Survey

3.5.1 In line with the Transport Scoping Study a Parking Stress Survey has been commissioned to establish the current parking restrictions and controls in force and also to identify the level of on-street parking which takes place.

3.5.2 Alpha Parking Limited undertook the surveys between 01:00-05:30, 09:00-10:00 and 13:00-14:00 on Monday 12 and Tuesday 13 November 2018 and a copy of the final report is attached at **Appendix B**.

3.5.3 The overall conclusion of this report is that both day (AM and PM) and overnight parking stress levels are between 62% and 63%.

3.5.4 Further consideration of the implications of the development on existing on-street parking provision is provided in Section 4.2 of this report.

3.6 Pedestrian Activity Survey at North Sheen Station

3.6.1 During the consideration of application 19/0510/FUL, the 'Original Proposed Development', the matters of potential platform congestion and the availability of space on trains to London, particularly during the AM peak were raised by South Western Rail and TfL.

3.6.2 In order to be able to consider this in greater detail and to enable a development impact assessment to be undertaken a survey was undertaken on three neutral weekdays, Tuesday 8, Wednesday 9 and Thursday 10 October 2019 between the hours of 07:00-09:30 and 15:00-18:00. Unfortunately, due to a camera failure data was not recorded after 09:20 on Thursday 10. However, a further survey was subsequently undertaken on Thursday 24 October 2019 to obtain additional data for analysis.

3.6.3 The full results of the surveys are presented at **Appendix C** and summarised as follows, (numbers in brackets represent cyclists):-

Time Period	Tuesday 08/10/19		Wednesday 09/10/19		Thursday 10/10/19		Thursday 24/10/19	
	In	Out	In	Out	In	Out	In	Out
07:00 – 07:30	99	31	93	25 (1)	90	25 (1)	73	23
07:30 – 08:00	160	31 (1)	129	28 (1)	138	36 (1)	111	27 (2)
08:00 – 08:30	130	51	124	38	114	35	141	47
08:30 – 09:00	81	21	73	24	73	30	75	30
09:00 – 09:30	49	11	58	19			58	15
AM Total	**519**	**145 (1)**	**477**	**134 (2)**			**458**	**142 (2)**
15:00 – 15:30	24	24	27	17 (1)			23	27
15:30 – 16:00	12	18	42 (1)	27			24	21
16:00 – 16:30	27	50	24 (1)	31			28	18
16:30 – 17:00	33	55	31 (6)	46 (1)			23	58
17:00 – 17:30	42 (1)	56 (1)	23 (2)	44 (1)			44 (1)	53
17:30 – 18:00	23	73	31 (2)	95 (3)			30 (1)	80
18:00 – 18:30	32	54	30 (1)	42			27	36
PM Total	**193 (1)**	**330 (1)**	**208 (13)**	**302 (6)**			**199 (2)**	**293**

Table 3 – Summary of pedestrian activity at North Sheen Station

3.6.4 The base data recorded during this survey is analysed in greater in Section 5.4 where the number of visitors to the station is compared to the frequency of trains typically stopping at North Sheen Station during these peak periods.

3.7 Personal Injury Accident Data

3.7.1 The Transport Assessment reports prepared in support of the Original Proposed Development (Ref: 10596-002-03, Feb 2019) and the November 2019 Amendments (Ref: 11205-001-03, Nov 2019) provided a review of personal injury accident data on the local highway network for the 5 year period up to 31st December 2017.

3.7.2 The data identified a total of 31 incidents had occurred within the study area; of which 2 were 'serious' incidents and the remainder were all considered 'slight' in severity. No fatal incidents had been recorded. A review of the contributory factors found that there were no particular accident trends in terms of type or location.

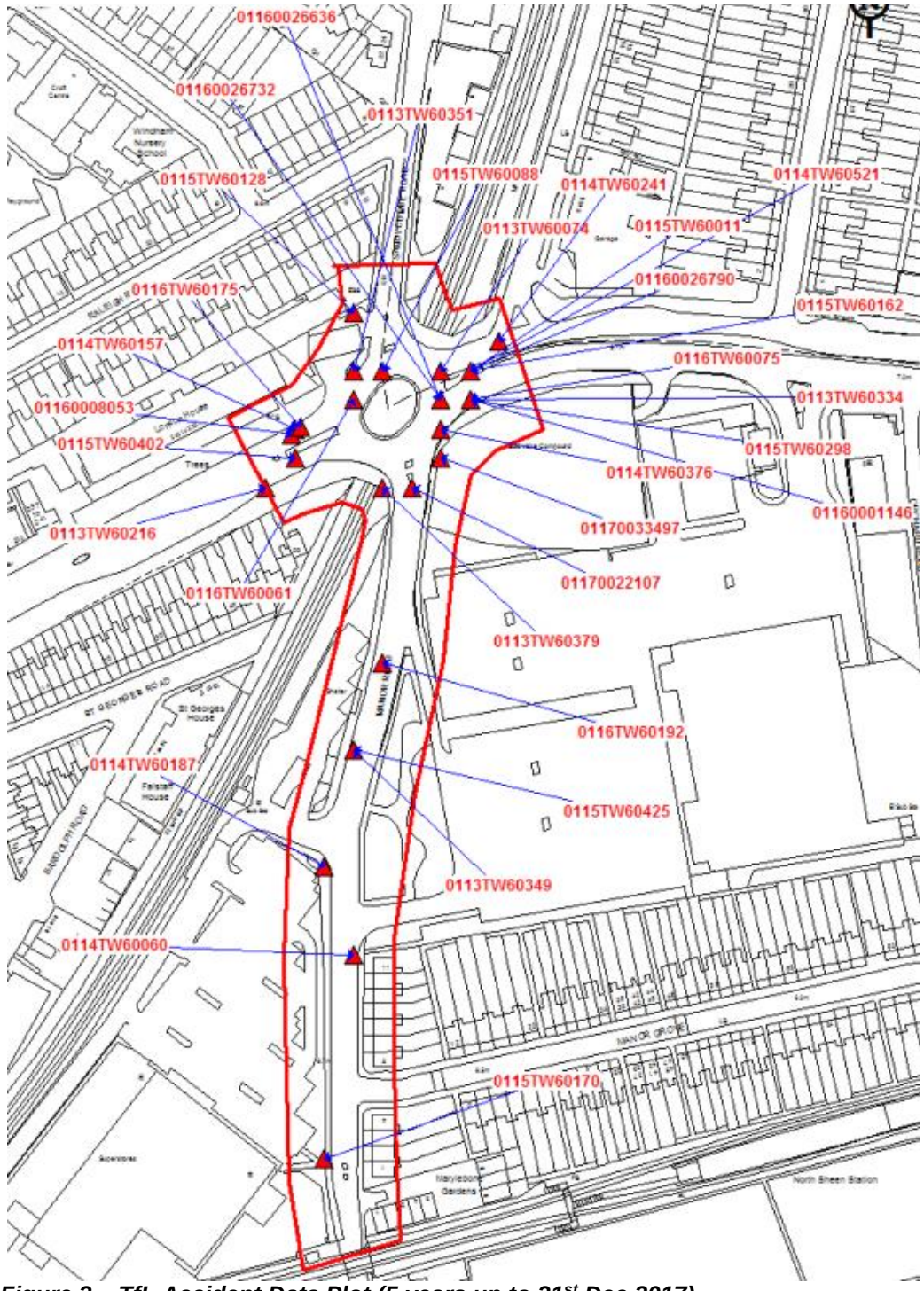


Figure 3 – TfL Accident Data Plot (5 years up to 31st Dec 2017)

3.7.3 In order to bring the assessment up to date, the Crashmap accident database has been reviewed to identify any additional incidents that have taken place since 1st January 2018. It should be noted that the latest available data includes up to 31st December 2019. The following extract from Crashmap shows the location and severity of each incident recorded during the aforementioned two year period.

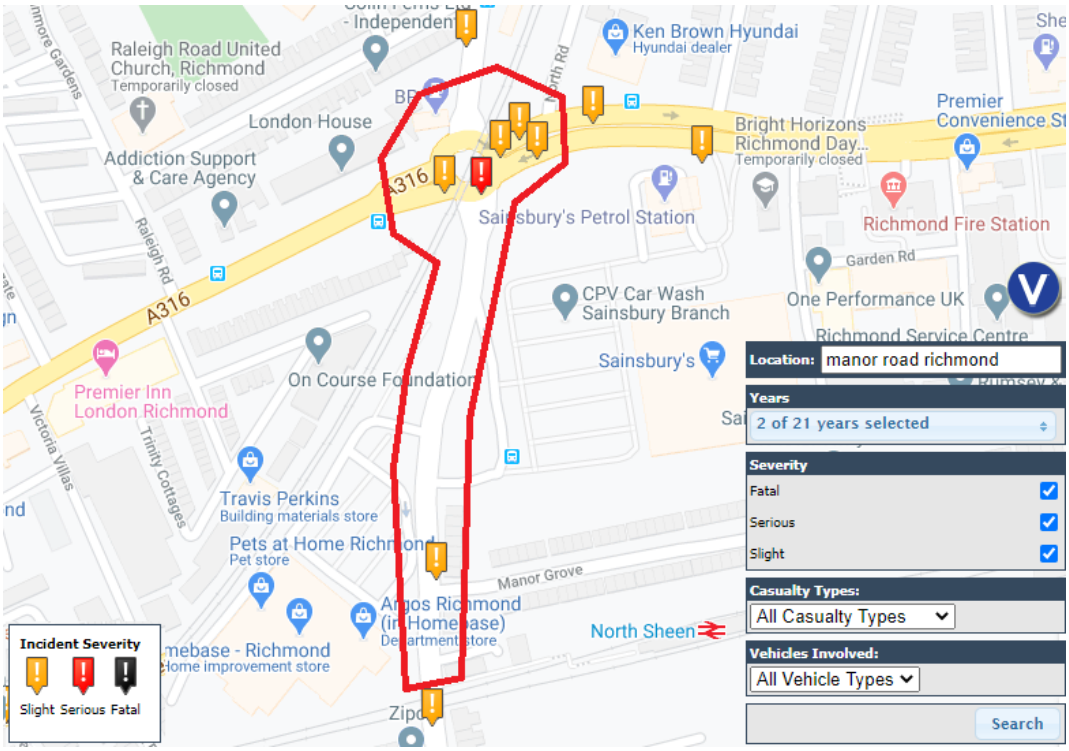


Figure 4 - Crashmap Accident Data Plot (2 years up to 31st Dec 2019)

3.7.4 The Crashmap database identifies that there have been a total of 6 incidents recorded within the latest two year period; of which 1 was a serious incident and 5 were slight in severity.

3.7.5 In terms of location, 1 (slight) incident took place along Manor Road in proximity to the junction with Manor Grove, whilst the remaining incidents (4 slight, 1 serious) all occurred at or in close proximity to the roundabout junction.

3.7.6 In terms of type, 2 incidents (both 'slight') involved pedestrian casualties, 2 incidents (1 'slight', 1 'serious') involved cyclists, and the remaining 2 incidents were collisions between two vehicles.

3.7.7 Due to the progression of time since the previous Transport Assessments were prepared, and the subsequent inclusion of the 2018 / 2019 accident data, it is considered appropriate to discount the previously assessed 2013 / 2014 accident data as this now falls outside the accepted 5 year study period.

3.7.8 In total, between 1st January 2013 and 31st December 2014, a total of 14 incidents were recorded within the study area, of which, 13 were 'slight' in severity and 1 was a 'serious' incident. 3 incidents (all 'slight') occurred at varying locations along Manor Road, whilst the remaining 11 incidents took place at the roundabout junction.

3.7.9 Based on the above, it is considered that the accident history on the local highway network has improved since the original assessments were undertaken, and that there have been no emergent accident trends that require further consideration.

4 Development Proposals

4.1 Development Overview

4.1.1 The development proposes the demolition of existing buildings and structures and comprehensive phased residential-led redevelopment to provide 453 residential units (of which 173 units will be affordable), flexible retail, community and office uses, provision of car and cycle parking, landscaping, public and private open spaces and all other necessary enabling works.

4.1.2 A total of 453 residential units are proposed, of which, 173 are to be affordable homes (40% by habitable rooms). Further details of the development mix are provided below:

Private Rent = 280 homes *(713 habitable rooms)*

Shared Ownership = 34 homes *(101 habitable rooms)*

London Living Rent = 36 homes *(83 habitable rooms)*

London Affordable Rent = 103 homes *(293 habitable rooms)*

Unit Type	Mix %	Units
Studio / 1 bed 1 person	6.6%	30
1 bed 2 person	31.6%	143
2 bed 3 person	27.2%	123
2 bed 4 person	27.2%	123
3 bed 5 person	0.4%	2
3 bed 6 person	7.1%	32
	Total =	453

Table 4 – Proposed Schedule of Accommodation

4.1.3 The two commercial units are located at ground floor level of Blocks A and D facing on to Manor Road. The Block D unit section extends towards the level crossing both areas flanking the main entrance to the site, opposite Manor Grove. The total proposed commercial floor space is 495m² GIA.

4.1.4 Each building is to have stairwells and lifts to provide access to the residential units on upper floors with access to highway network being available via a network of footpaths and communal areas. The proposed ground floor layout is included at **Appendix D**.

4.1.5 The primary pedestrian and cycle entrance to the site is to be off Manor Road opposite Manor Grove with vehicular access remaining from Manor Road in the place of the existing site access.

4.2 Parking Provision

4.2.1 The development is to be "car-free" with no standard car parking spaces provided. 14 Nº car parking spaces (3% provision) are proposed within the site and these are all designated as accessible spaces. The potential to increase to the full 10% provision has been assessed and full details of this are available in the Landscape Addendum (July 2020) prepared by Gillespies (see sections 1.7 and 1.8 of the Landscape Addendum report).

4.2.2 In addition to the above, two electric car club spaces are to be provided on site, located between blocks A and B, as shown in Figure 4A, overleaf. Car Clubs are widely accessible and provide users with access to a vehicle, without the need to own one themselves. They will be managed by the operators of the scheme who are to be confirmed in due course with the provision to be secured via a S106 obligation.

Figure 4A – Location of car club spaces (Assael, November 2021)

4.2.3 Policy T6 Car parking within the London Plan (2021) states that; *"Car-free development should be the starting point for all development proposals in places that are (or are planned to be) well-connected by public transport".* The maximum residential parking standards state that for all new developments in Outer London boroughs with a PTAL rating of 4 the maximum provision is 'up to 0.5-0.75 spaces per dwelling'. However, the notes state that *"When considering development proposals that are higher density or in more accessible locations, the lower standard shown here should be applied as a maximum"* therefore, in this case, 0.5 spaces per dwelling is the maximum provision. It is therefore considered that the car-free proposals remain in conformity with the London Plan.

4.2.4 In line with the policies of TfL and LBRuT, residents of the Amended Proposed Development will be restricted from applying for residents parking permits for those roads in the vicinity of the site subject to such restrictions. This will be secured by way of a planning condition/obligation.

4.2.5 However, in order to mitigate against residents of the proposed development parking on roads in the vicinity of the site which are subject to daytime only parking restrictions or no restriction at all, the results of the parking stress survey attached at Appendix B have been discussed in detail with LBRuT with a view to amending and extending the existing Traffic Regulation Orders covering the Controlled Parking Zones adjacent to the site.

4.2.6 During the LBRuT determination period it was agreed that a contribution of £50,000.00 would be made to support a Controlled Parking Zone study with a further £50,000.00 to be provided (conditionally) should amendments be deemed necessary. This is likely to be secured by way of a planning obligation.

4.3 Cycle Parking

4.3.1 With regards to cycle parking; Chapter 10 – 'Transport' of the London Plan sets out the applicable standards for the commercial and residential elements of the development. These are summarised in Table 5:

	Use class	Long stay	Short stay
Commercial	A1 Food retail	1 space per 175sqm GEA	1 space per 20sqm
	A1 Non-food retail	1 space per 250sqm	1 space per 60sqm
	A2	1 space per 175sqm GEA	1 space per 20sqm
	B1 Office	1 space per 75sqm	1 space per 500sqm
Residential	C3	1 space per studio/1b1p unit, 1.5 spaces per 1b2p unit 2 spaces all other dwellings	1 space per 40 units

Table 5 –London Plan - Table 10.2: Minimum Cycle Parking Standards

4.3.2 As the exact use of the commercial areas is not yet known, the most stringent standards have been applied resulting in the following requirements for the proposed development.

Land Use	Long Stay Provision Minimum Requirement	Short Stay Provision Minimum Requirement
Commercial Flexible A1/A2/A3/D2/B1 495m²	7	25
Residential (C3) 453 Units	805	12
Total	**812**	**37**

Table 6 – Amended Proposed Development cycle parking requirements

4.3.3 The development proposes to provide a total of 817 long stay cycle parking spaces which is above the standards required in order to promote the use of this transport mode.

4.3.4 The required short stay cycle parking provision is to be located throughout the open space of the site, incorporated into the landscaping.

4.3.5 An extract from the Assael Architecture Design and Access Statement Addendum (November 2019) which details the locations of the cycle parking/storage across the site is provided overleaf (Figure 5). Since the production of this plan the location of the refuse stores has been amended (see Section 4.5), however, the cycle parking remains as shown in Figure 5.

Figure 5 – Location of Cycle Parking/Storage (Assael, November 2019)

4.4 Highway Improvements

4.4.1 As part of the proposals, improvements are to be made to the footway along the site frontage, including widening and planting of trees and shrubs.

4.4.2 TfL have plans to make safety improvements to the roundabout junction to the north of the site. These works are expected to include signalising the junction, including the introduction of signalised pedestrian crossings, and providing an improved environment for both pedestrians and cyclists. During the LBRuT determination period a contribution of £330,000 was agreed with TfL towards this scheme which was 15% of the estimated final scheme costs. This was requested having regard to the predicted increase in users at Manor Circus generated by the proposed development.

4.4.3 However, during more recent pre-application discussions it has been established that the scheme design costs have risen. Therefore, TfL requested a revised financial contribution of £380,000 towards the implementation of the Manor Circus scheme. The developer has agreed to the revised contribution sum.

4.5 Servicing

4.5.1 All servicing of the buildings is to be undertaken within the site. All of the buildings will have a managed waste system whereby the refuse bins will be moved to a collection area in readiness for the refuse collection vehicle. The November 2021 amendments to the scheme have resulted in both internal and external refuse storage areas being relocated as per Figure 5A below:-

Figure 5A – Location of refuse stores (Assael, November 2021)

4.5.2 Swept path analysis of a refuse collection vehicle, rigid vehicle, hydraulic inspection platform and fire appliance has been carried out and is detailed on drawing **300025-001** attached at **Appendix E.**

4.5.3 The servicing of the development has been the subject of detailed consideration and assessment, particularly with regards to the proposed commercial units. During the on-going review of the development proposals by both the team and the planning authorities consideration has been given to the feasibility of frontage servicing direct from Manor Road.

4.5.4 However, given the close proximity of these frontage units to the level crossing it is considered that this would not be in the best interests of highway safety and especially that of pedestrians.

4.5.5 The whole length of the Manor Road frontage to the development site (both sides) is subject to a TRO restricting parking at all times. It is unclear whether there are specific restrictions to loading and unloading and it is possible that an amendment to the TRO may be required to enable enforcement of such scenarios.

4.5.6 The parking of a delivery vehicle of any kind or size would potentially give rise to situations where northbound vehicles would be unable to pass a parked delivery vehicle due to either the island within the carriageway or southbound traffic. Such a queue of traffic would quickly extend to the level crossing and the inherent dangers this would present.

4.5.7 The formation of a servicing lay-by along the Manor Road frontage has also been considered. However, the creation of such a facility, whilst maintaining a suitable footway width, would eat into the development site to a significant extent. In addition to this the potential for conflict between the prevalent pedestrian flow (north-south) and the desire line for servicing (east-west) would be significant particularly at peak commuter times.

4.5.8 Whilst it is accepted that the above situation already occurs on many of London's streets it is considered that a viable alternative is available in this particular case which avoids such conflicts.

4.5.9 The erection of pedestrian guard railing is an option which would prevent ad-hoc loading and unloading but this carries with it the possibility of pedestrian becoming trapped on the wrong side of the guardrails within the carriageway. A line of bollards would, therefore, appear to be a more viable option although this would still reduce the effective footway width as the bollards would have to set in 500mm from the kerb line.

4.5.10 It is, therefore, recommended that all occupiers of the commercial units are required to advise all their delivery providers that they must use the servicing area within the site which has been made available within the development design. It is suggested that such an operational requirement be included in any lease agreement or other similar legal document.

4.5.11 Further details regarding the servicing of the development are included within the site's Revised Servicing and Delivery Management Plan, which has been prepared under separate cover.

5 Sustainable Travel

5.1 Overview

5.1.1 This section of the report considers the accessibility of the development by sustainable modes of transport in order to review the opportunities that will exist for residents, staff and visitors.

5.1.2 In preparation of the June 2020 Revised Transport Assessment, TfL's WebCAT Planning Tool was used to identify the site's Public Transport Accessibility Level (PTAL) rating. The site previously had a PTAL rating of 5 however, due to alterations to the bus services in the vicinity, this has been changed to 4. Details of the bus service changes are included in section 5.4.

5.1.3 South Western Railway have undertaken a timetable consultation with changes proposed to take effect in December 2022. The proposed changes have been assessed to determine whether they will have a further impact on the PTAL rating of the site.

5.2 Accessibility on Foot

5.2.1 Walking is the most important mode of transport in the local level and can replace short car trips in journeys under 2km, which contribute to congestion and pollution, and the need for car parking.

5.2.2 Further guidance on walking accessibility is provided in the Department for Transport's document 'Building Sustainable Transport into New Developments' (2008) which gives the following advice:

"Walkable neighbourhoods are typically characterised as having a range of facilities within 10 minutes walking distance (around 800m). However, the propensity to walk or cycle is not only influenced by distance but also the quality of the experience; people may be willing to walk or cycle further where their surroundings are more attractive, safe and stimulating."

5.2.3 The IHT publication *"Providing for Journeys on Foot"* also identifies suggested acceptable walking distances for commuting, school and sight-seeing as follows with times based on a walking speed of 1.4m/s.

Desirable 500m	6 minutes
Acceptable 1000m	12 minutes
Preferred maximum 2000m	24 minutes

5.2.4 Figure 6 identifies 500m, 1km and 2km walking radii from the site. It is noted that walking routes will not follow the simple radius of this plan and the plan is provided as an indication of where destinations lie and the general extent to which the local area can be accessed on foot.

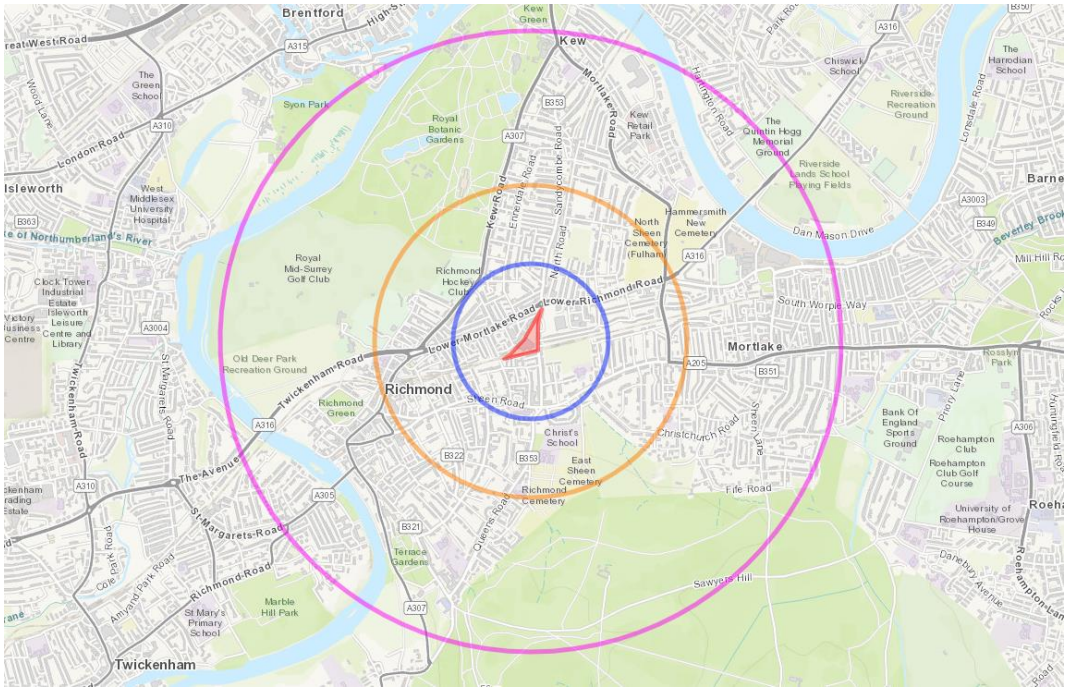


Figure 6 – Walking Radii ***[NatGeo]***

5.2.5 The following amenities and facilities are all located within walking distance of the site:

- Within a 500m walking distance of the site there are bus stops on Manor Road, Lower Richmond Road, Sandycombe Road and Lower Mortlake Road, North Sheen Train Station, Sainsbury's supermarket, Lloyd's Pharmacy, Starbucks coffee shop, Bright Horizons Day Nursery and Preschool.

- Within a 1km walking distance of the site there is Darel Primary School, Windham Nursery School, The Kings Road Nursery, Marshgate Primary School, Christ's School and Sixth Form Centre, Holy Trinity Primary School, North Sheen recreation ground, North Sheen Bowling Club, Skinners Newsagent and Post Office, Seymour House Surgery, Kew Road Dental, Dental Care London, Specsavers and Vision Express.
- Within 2km there is Kings House School, North Road Surgery, Pensford Tennis Club, Richmond Town Centre with various amenities and facilities, Richmond Station, Kew Gardens Station and Royal Botanic Gardens at Kew.

5.2.6 It is therefore considered that local facilities are highly accessible by pedestrians with a wide range of key amenities within acceptable walking distance of the site.

5.2.7 CIHT's 'Buses in Urban Development' (Jan 2018) identifies 500m as the recommended maximum walking distances to a 'core bus corridor with two or more high-frequency services. Furthermore, the PTAL assessment takes into account bus stops within 640m. The bus stops on Manor Road are located approximately 170-180m from the site therefore within the desired walking distance. Bus stops on Lower Mortlake Road and Lower Richmond Road are located approximately 340-390m from the site therefore within acceptable walking distances.

5.3 Accessibility by Cycle

5.3.1 Like walking, cycling has an important part to play in reducing congestion, improving accessibility and reducing pollution. Cycling may also allow people without cars to reach destinations that they may otherwise be unable to reach. CIHT's Planning for Cycling (2014) states that 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. 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.

5.3.2 Figure 7 identifies an 8km (5 mile) radius from the site. Again, it is noted that cycling routes will not follow the simple radius of this plan and it is provided as an indication of where destinations lie and the general extent to which the local area can be accessed by cycle.

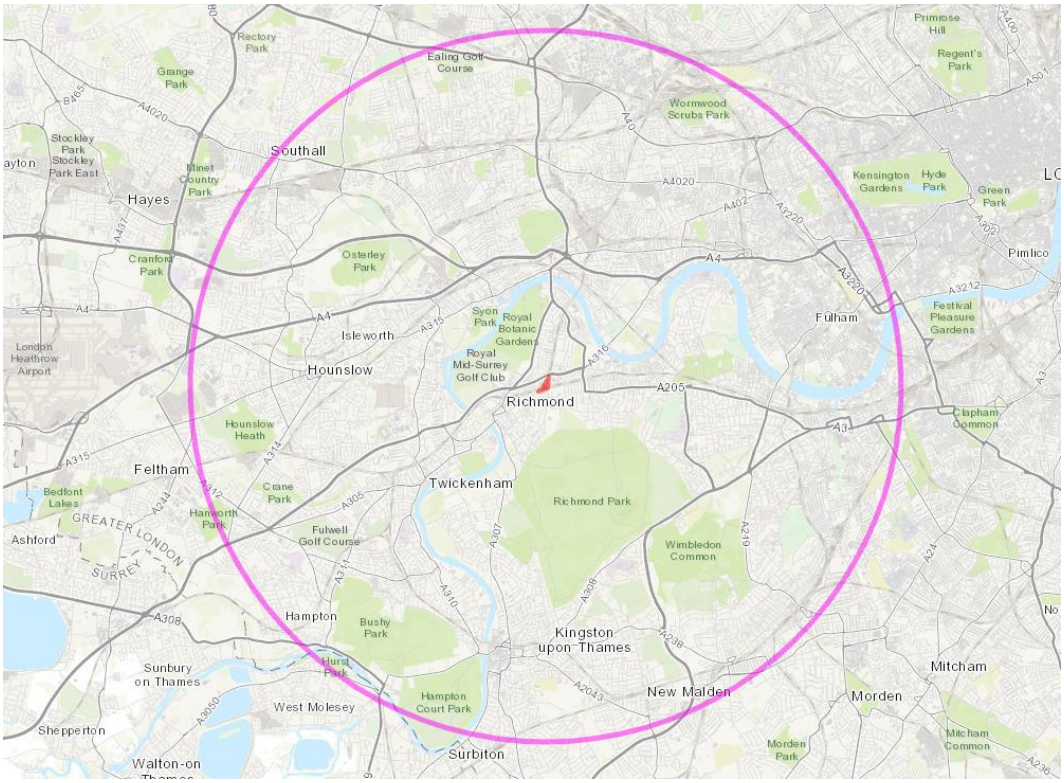


Figure 7 – 8km Cycling Radius

5.3.3 In the vicinity of the site, Manor Road, Manor Grove, Lower Richmond Road and Lower Mortlake Road are shown as off road/quiet cycle routes on the Transport for London Cycling Guides.

5.3.4 The site is accessible by cycle and plentiful cycle parking will be provided. It is therefore concluded that the site's location provides good cycling accessibility to the local area and the local infrastructure provides good opportunities for cycle use with ongoing connectivity to public transport.

5.4 Accessibility by Public Transport

5.4.1 The closest bus stops to the site are located on Manor Road approximately 170-180m from the site. In addition, bus stops are located on Lower Mortlake Road, Lower Richmond Road and Sandycombe Road slightly further from the site. Meanwhile, the closest train station to the site is North Sheen Station located approximately 180m to the east of the site and Richmond Station (which provides both rail and underground services) is located approximately 1.5km from the site which equates to a 30 minute walk or 7½ minute cycle journey. Figure 8 is an extract from TfL's Public Transport Map and identifies the location of .the aforementioned facilities.

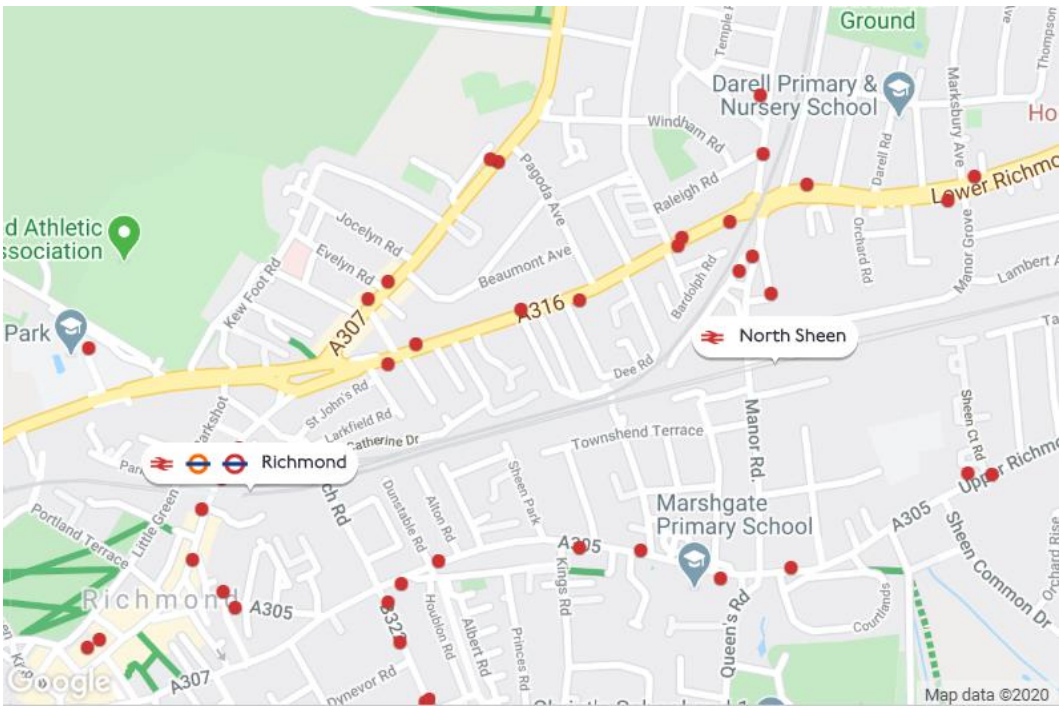


Figure 8 – TfL Public Transport Map extract

5.4.2 A summary of the services that were available from the bus stops within recommended walking distance of the site prior to the disruption caused by Covid-19 is provided overleaf.

		Approximate Peak Frequency		
Service	**Route**	**Mon - Sat Daytime**	**Mon - Sat Evening**	**Sunday**
190	George Street – Empress State Building/West Brompton Station	15 mins	20 mins	20 mins
371	Manor Road/Sainsbury's – Kingston Hall Road	8-12 mins	15 mins	11-12 mins
391	George Street – Sands End/Sainsbury's	9-14 mins	15 mins	11-14 mins
419	George Street – Hammersmith Bus Station	15 mins	20-30 mins	30 mins
493	St George's/University of London – Richmond/Manor Road	9-14 mins	20 mins	20 mins
H22	The Bell – Manor Road	11-14 mins	20 mins	20 mins
H37	Hounslow/Blenheim Centre – Manor Road	5-10 mins	6-15 mins	7-10 mins
N22	South Road/Fulwell – Margaret Street/Oxford Circus (Night Bus)	No Service	30 mins	30 mins
R68	Kew Retail Park – Hampton Court Station	15 mins	20 mins	15 mins
R70	Nurserylands Shopping Centre – Richmond/Manor Road	6-12 mins	15-20 mins	15 mins

Table 7 – Summary of bus services

5.4.3 As can be seen from the above, there are a wide range of frequent bus services available seven days a week. The above services stop at various rail and tube stations which provide frequent and varied services to a wider range of destinations for onward travel.

5.4.4 However, TfL advised that a number of alterations to the bus services in the vicinity of the site came into effect on 12th December 2020. The changes were made in order to address areas of surplus capacity and to reallocate resources where additional capacity is needed in Richmond, Twickenham and Whitton. The alterations are summarised below:

- Route H37 frequency reduced from 10bph to 8bph.
- Route 493 terminates at Richmond Bus Station rather than at Richmond Manor Circus. However, whilst route 493 will no longer serve Manor Circus, it will continue to service the south side of the site from East Sheen (albeit a longer walk time).

- Route H22 will no longer operate between Richmond and Twickenham
- Route 391 will be renumbered to 110.

5.4.5 The following bus routes still serve (within 640m) the application site: 371 and R70 (Manor Road), 110, 190, 419, H37, R68 and N22 Manor Circus and 33, 337, 493 and N33 (at East Sheen).

5.4.6 It is noted that, with the revised services, TfL remain satisfied that there is sufficient spare capacity on the bus network to accommodate the uplift in bus demand generated by the development.

5.4.7 North Sheen Railway Station is a two platform station that is under the management of South Western Railway. It provides the following facilities; information services, ticket counter, ticket machines and help points. No car or cycle parking facilities are available at this station. This station provides services to Chiswick, London Waterloo, Wimbledon, Putney and other local destinations.

5.4.8 As detailed in Section 3.6 a survey of pedestrian activity at the station has been undertaken. This has revealed that on a typical neutral weekday the morning "peak" occurs between 07:30 and 08:30 when an average of 262 passengers enter the station.

5.4.9 As there is only a single point of entry linking to a central platform it is not known for certain which direction passengers are intending to travel in. However, it is noted that trains from North Sheen towards central London (Waterloo) are available on both west and east bound lines with varying journey times and number of stops.

5.4.10 In this "peak" period 8 trains are scheduled to stop at North Sheen which provide access to London Waterloo and varying station en-route. Some trains provide an option to change at Richmond to catch a faster onward train.

5.4.11 It is, therefore, considered that typically these 8 services would need to be able to accommodate, on average 33 passengers each. Bearing in mind that the South Western Rail trains on this line usually operate between 8 and 10 carriages during peak times this is not considered to be unreasonable.

5.4.12 Richmond Station provides access to both rail and underground services. The station provides the following facilities: CCTV monitored cycle stands for 212 cycles, 55 space car park, taxi/drop off area, fully staffed ticket office, ticket machines, help points, ATM, pay phones, post box, toilets, waiting rooms, shops, step free access and ramps for train access with staff available to help.

5.4.13 This station provides rail services to Chiswick, London Waterloo, Reading, Wokingham and other local destinations. Richmond Station also provides Overground line services on the Richmond and Clapham Junction to Stratford route with approximately 12-18 minute frequency.

5.4.14 There have been recent rail improvements including the introduction of new trains which has increased the available capacity of the trains on key routes in south-west London. In addition, Network Rail has also improved/realigned the platforms at Waterloo Station which now means that all 24 platforms are able to be used for South Western train services thus increasing the available services and reliability.

5.4.15 District line underground services are also available at approximately 10 minute intervals.

5.5 South Western Railway Timetable Consultation

5.5.1 South Western Railway (SWR) have undertaken a timetable consultation with the changes proposed to take effect in December 2022. The proposals have been assessed to determine whether they will have an impact on the PTAL rating of the site.

5.5.2 SWR, divide their lines into four areas; Main Suburban, Windsor, Mainline and West of England. North Sheen is served by the Windsor routes, specifically the London Waterloo to Kingston via Richmond, Shepperton via Twickenham and Hounslow via Richmond lines. **Figure 9**, overleaf, is an extract from the Timetable Consultation document with the lines that serve North Sheen highlighted. The tables detail the number of services per hour in the direction of London however trains also run on these lines in the opposite direction.

Outline specification – Windsor peak			
	AM high peak trains per hour to London		
	May 2019	May 2021	December 2022
Reading	4	2	3
Windsor	2	2	2
Weybridge via Brentford	2	2	2
Kingston via Richmond	2	2	2
Shepperton via Twickenham	2	2	2
Hounslow via Richmond	0	0	1
Hounslow via Brentford	3	2	2
Aldershot via Ascot	2	1	2
Total	**17**	**13**	**16**

Outline specification – Windsor off peak			
	Off peak trains per hour to London		
	May 2019	May 2021	December 2022
Reading	2	2	2
Windsor	2	2	2
Weybridge via Brentford	2	2	2
Kingston via Richmond	2	2	2
Hounslow via Richmond	2	0	0
Hounslow via Brentford	2	0	2
Total	**12**	**8**	**10**

Figure 9 – Extract from SWR Timetable Consultation document

5.5.3 As can be seen, the number of trains in the direction of London during the AM high peak, which is defined as between 08:00 and 08:59, was four "pre-Covid" and is proposed to be five from December 2022. During off-peak hours there were previously four trains and this is proposed to reduce to two, in line with current provision due to the impacts of Covid.

5.5.4 Section 2.5 of Transport for London's *'Assessing transport connectivity in London'* document details how PTAL ratings are calculated. It is stated that "The standard PTAL calculation is based on service frequencies in the period between 08:15 and 09:15 on a weekday". Although this does not align exactly with the 'high peak' defined by SWR, it is considered that it is reasonable to compare the two periods for the purpose of this assessment.

5.5.5 As the PTAL rating is calculated based on AM peak period services, the proposed amendments to off-peak services will have no impact on the rating of the site.

5.5.6 In the AM peak the number of services calling at North Sheen is proposed to increase. As a result, the PTAL rating of the site will not be reduced and provision will, in fact, be improved.

5.6 Accessibility Summary

5.6.1 The site is considered to be highly accessible by both active and public transport, as reflected by the site's PTAL rating of 4. As such, residents, staff and visitors to the development will have a choice of sustainable travel options which will reduce the need to travel by car.

5.6.2 From analysis of the pedestrian survey which recorded activity at the entrance/exit at North Sheen Station it is considered that existing rail passengers can be accommodated on peak hour services. Further analysis of the predicted uplift also indicates that the station and attending trains will be able to accommodate future passenger levels during peak hours.

5.7 Healthy Streets Approach

5.7.1 The 'Healthy Streets Approach' has been introduced by the Mayor of London, Sadiq Khan, and "aims to reduce traffic, pollution and noise, create more attractive, accessible and people-friendly streets where everybody can enjoy spending time and being physically active, and ultimately to improve people's health". There are ten indicators as illustrated below:

Figure 10 – Ten Healthy Streets Indicators (TfL)

5.7.2 In relation to these indicators, the development will encourage travel by active and sustainable modes by being predominantly car-free, providing ample cycle parking and electric car club vehicles.

5.7.3 It will also provide public spaces with seating where people can relax, rest and seek shade and shelter in a safe environment. The improvements to the footway on the site frontage will ensure the space is suitable for all sections of the community and will be able to accommodate a range of activities. A dropped crossing with tactile paving will be provided across the site access road to assist with pedestrian movements along Manor Road.

5.7.4 In addition, Manor Road is street-lit and the addition of trees and shrubs will add to the varied appearance of the frontage. The courtyard within the site will be used for various events potentially including markets, art installations and outdoor cinema which will bring life and interest to the area.

5.7.5 In line with the strategies incorporated into the London Plan 2021 and additional guidance published by TfL, a detailed Active Travel Zone assessment has been undertaken. This is attached at **Appendix G**.

5.7.6 The scope of this assessment was agreed in advance with TfL and was limited to Manor Circus to the north of the site and then extended to include the nearest primary school and GP surgery both of were identified as being located on Sheen Road to the south of the site.

5.7.7 The routes assessed generally perform well in relation to the Healthy Streets indicators by providing safe places to cross, being well-maintained, not having an accident history of concern and having public and private areas of vegetation that provide interest and variety. In addition, the development will enhance the routes along the site frontage by providing improved footways, landscaping, places to rest and overlooking buildings.

5.7.8 Within the London Plan the Mayor, through TfL and the boroughs, proposes to set out a programme to achieve the Vision Zero aim of reducing the number of people killed or seriously injured on London's streets to zero. The key aims of this strategy are shown in the diagram overleaf which is extracted from the "Vision Zero Action Plan".

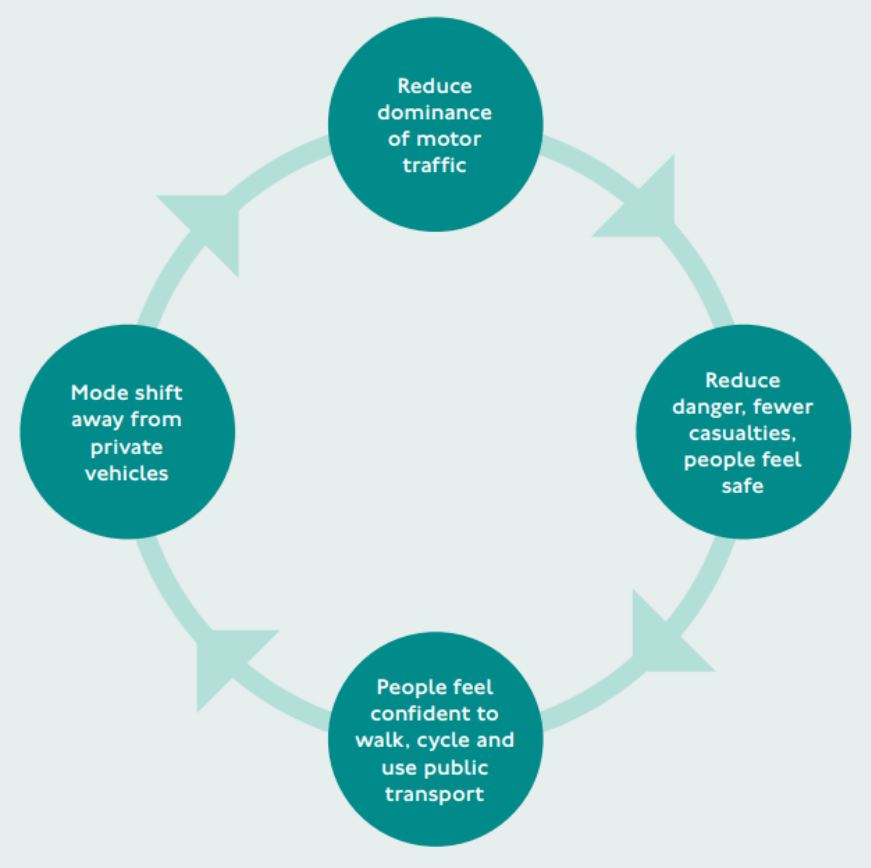


Figure 11 – Road danger reduction (TfL)

5.7.9 In order to tie into this strategy the following initiatives have been integrated within the Amended Proposed Development:-

- Virtually car-free development, providing only disabled parking
- Contribution to improvements to Manor Circus which will benefit pedestrians and cyclists
- Permeable links to all parts of the site
- Improved facilities for public transport

6 Multimodal Traffic Generations

6.1 As part of the Environmental Assessment screening process associated with the Original Proposed Development a Technical Note was prepared by Sanderson's (10596-TN1) which considered, in detail, the potential traffic impact resulting from the development proposals. The Technical Note looked at trip generation information from the TRICS database for each proposed land use and highlighted how influencing factors such as accessibility by sustainable travel modes (PTAL ratings) and parking availability within and in proximity to the site have a significant impact on how people travel to and from the site. Consequentially, a considered approach was taken to obtain multimodal trip rates which were as representative of the development proposals as practicable. The resulting trip rates and forecast trip generations were presented in the previously submitted Transport Assessment dated February 2019.

6.2 However, during the LBRuT determination period of the Original Proposed Development, TfL advised that it did not agree with the methodology applied to predict the multi modal generation potential of the proposed development. It was advised that the residential trip rate assessment must be based on total person trip rates which had not been adjusted to remove sites from the TRICs Database with higher parking ratios. Instead, TfL advised that 2011 Census 'Method of Travel to Work' data to be used to establish mode share which should then be adjusted down to account for the limited car parking provision and the remaining trips reassigned pro-rata to the other modes.

6.3 This chapter of the Revised Transport Assessment identifies the multimodal trip generation potential of the Amended Proposed Development based on both TfL's desired assessment methodology and Sanderson's original approach.

6.4 TfL Methodology

6.4.1 Total person trip rates for each proposed land use have been derived from the TRICS database. The sites used to generate the trip rates have been filtered to remove any sites considered unrepresentative in terms of accessibility (PTAL <4 excluded), however, no further filtering in relation to parking has been undertaken as requested by TfL.

6.4.2 A summary of the total person trip rates and generations for each land use is provided below along with details of the TRICS filtering parameters applied.

Residential Multimodal Generations

Privately Owned Flats

Land Use: 03 – Residential

Category: C – Flats Privately Owned

Selected Regions and Areas: Greater London only (sites with PTAL rating less than 4 excluded)

Parameter: Number of Dwellings

Actual Range: 9-472 units

Date Range: 01/01/10 – 03/07/18

Selected Survey Days: Monday – Friday

Selected Locations: Town centre sites excluded

6.4.3 The following table provides details of the resulting weekday AM and PM peak hour total person two-way trip rates per unit along with the corresponding generated trips for the proposed private 280 units. The full TRICS outputs are contained in **Appendix H**.

Time	Trip Rate per Unit	Generations from 280 units
Weekday AM Peak (08:00-09:00)	0.542	152
Weekday PM Peak (17:00-18:00)	0.449	126
Weekday Daily	4.565	1278

Table 8 – Total person trip generations for private residential element (280 units)

Affordable Flats

Land Use: 03 – Residential

Category: D – Affordable/Local Authority Flats

Selected Regions and Areas: Greater London only (sites with PTAL rating less than 4 excluded)

Parameter: Number of Dwellings

Actual Range: 36-247 units

Date Range: 01/01/10 – 27/06/16

Selected Survey Days: Monday – Friday

Selected Locations: Town Centre sites excluded

6.4.4 The following tables provide details of the weekday AM and PM peak hour total person two-way trip rates per unit along with the corresponding generated trips for the proposed 173 affordable units. The full TRICS data is contained in **Appendix I**.

Time	Trip Rate per Unit	Generations from 173 units
Weekday AM Peak (08:00-09:00)	0.646	112
Weekday PM Peak (17:00-18:00)	0.450	78
Weekday Daily	6.702	1159

Table 9 – Total person trip generations - affordable residential (173 units)

6.4.5 In summary, the total person trip generations associated with the residential element of the development can be summarised as follows:

Time	Total generations
Weekday AM Peak (08:00-09:00)	264
Weekday PM Peak (17:00-18:00)	204
Weekday Daily	2,438

Table 10 – Total person trip generations

6.4.6 In order to determine the likely modal split of the person trips calculated above the 2011 Census Data – Method of Travel to Work dataset has been used. The Richmond upon Thames 004 MSOA (Middle Super Output Area), in which the site lies, has been compared to Richmond as a whole and England and the table below gives a summary of this data with a full copy included at **Appendix J**.

Method of Travel to Work	Richmond upon Thames 004	Richmond upon Thames	England
	% working	% working	% working
Work Mainly at or From Home	8.0%	8.9%	5.4%
Underground, Metro, Light Rail, Tram	21.6%	10.7%	4.1%
Train	17.9%	21.9%	5.3%
Bus, Minibus or Coach	7.5%	7.6%	7.5%
Taxi	0.2%	0.2%	0.5%
Motorcycle, Scooter or Moped	1.6%	1.7%	0.8%
Driving a Car or Van	26.8%	32.5%	57.0%
Passenger in a Car or Van	1.2%	1.4%	5.0%
Bicycle	5.9%	6.1%	3.0%
On Foot	8.6%	8.2%	10.7%
Other Method of Travel to Work	0.8%	0.7%	0.6%

Table 11 – Census Data – Method of Travel to Work

6.4.7 As acknowledged by TfL, given the absence of 'standard' car parking spaces within the site it is considered that the level of generation associated with car / van drivers is unlikely to be realised. Therefore, to provide a more representative assessment, the modal share proportions have been adjusted so that vehicle occupancy (drivers and passengers) is limited to 3%. This is consistent with the level of car parking provided for disabled occupants.

Method of Travel to Work	%
Underground, Metro, Light Rail, Tram	32.7%
Train	27.1%
Bus, Minibus or Coach	11.3%
Taxi	0.3%
Motorcycle, Scooter or Moped	2.5%
Driving a Car or Van	2.9%
Passenger in a Car or Van	0.1%
Bicycle	8.9%
On Foot	13.0%
Other Method of Travel to Work	1.2%

Table 12 – Adjusted modal splits

6.4.8 The modal splits identified above have been applied to the total person trip rates and generations set out in Table 10 in order to establish the number of people travelling by each mode during the AM and PM peak periods, as well as on a daily basis.

6.4.9 It is acknowledged that due to the distance of the site from Richmond Underground Station, those travelling to work via the Underground are likely to first travel by bus in order to reach the station. Therefore, in order to provide a robust assessment, the estimated modal share for Underground users has been added to the modal share for bus users.

6.4.10 The generations for each mode of travel are summarised below:

		8 - 9 AM			17 - 18 PM			Daily		
		Arr	Dep	Two-way	Arr	Dep	Two-way	Arr	Dep	Two-way
Method of Travel to Work	**%**	*38*	*226*	*264*	*127*	*77*	*204*	*1196*	*1242*	*2438*
Underground, Metro, Light Rail, Tram	32.7%	12	74	86	42	25	67	391	406	797
Train	27.1%	10	61	72	34	21	55	324	337	661
Bus, Minibus or Coach	11.3%	4	26	30	14	9	23	135	140	275
Taxi	0.3%	0	1	1	0	0	1	4	4	8
Motorcycle, Scooter or Moped	2.5%	1	6	7	3	2	5	30	31	61
Driving a Car or Van	2.9%	1	7	8	4	2	6	35	36	71
Passenger in a Car or Van	0.1%	0	0	0	0	0	0	2	2	3
Bicycle	8.9%	3	20	24	11	7	18	107	111	217
On Foot	13.0%	5	29	34	17	10	27	156	162	317
Other Method of Travel to Work	1.2%	0	3	3	1	1	2	14	14	28
Bus + Underground		17	99	116	56	34	90	526	546	1072

Table 13 – AM, PM and Daily Multimodal Trip Generations (TfL Methodology)

Commercial Multimodal Generations

6.4.11 During the analysis of the TRICS database in relation to the proposed commercial space within the development it was noted that there were no “Greater London” sites in the “Shopping Centre - Local Shops” category.

6.4.12 It is, however, considered that the commercial spaces in question are of such a size that the end use would be limited to those outlets serving the immediate community and thus would generate the majority of its traffic as pass-by movements on foot and cycle.

6.5 Sanderson's Methodology

6.5.1 Again, total person trip rates for each proposed land use have been derived from the TRICS database and the sites used to generate the trip rates have been filtered to remove any sites considered unrepresentative in terms of accessibility (PTAL <4 excluded). However, on this occasion, further filtering has been undertaken to remove sites with a parking ratio per dwelling of > 0.5. Copies of the TRICS outputs with advanced filtering are included at **Appendix K**.

6.5.2 The resulting trip rates and generations associated with the residential elements of the development are summarised below. With regards to the commercial element of the development, the same principle applies as described in paragraphs 6.4.11 and 6.4.12.

Time	Trip Rate per Unit	Generations from 280 Units
Weekday AM Peak (08:00-09:00)	0.334	94
Weekday PM Peak (17:00-18:00)	0.345	97
Weekday Daily	3.637	1,018

Table 14 – Total person trip generations for private residential (280 units)

Time	Trip Rate per Unit	Generations from 173 Units
Weekday AM Peak (08:00-09:00)	0.632	109
Weekday PM Peak (17:00-18:00)	0.463	80
Weekday Daily	6.565	1,136

Table 15 – Total person trip generations - affordable residential (173 units)

Time	Total generations
Weekday AM Peak (08:00-09:00)	203
Weekday PM Peak (17:00-18:00)	177
Weekday Daily	2,154

Table 16 – Total person trip generations

6.5.3 It is considered that given the deliberated approach taken to derive trip rates from the TRICS database, the results of the TRICS assessment are representative of how a car-free development is likely to operate in an area of high accessibility such as the proposed development site (PTAL rating = 4).

6.5.4 It should also be noted that the TRICS data (based on surveys of similar sites) accounts for the movements associated with all journey purposes. As such it is considered appropriate to use the multimodal TRICS data to estimate the likely modal split with all journey purposes accounted for.

6.5.5 It is this point where Sanderson's methodology is inherently different to that requested by TfL which is entirely based upon 'Method of Travel to Work' data.

6.5.6 The 2018 National Travel Survey (Table NTS0409) identifies that commuting (i.e. Travel to Work journeys) accounts for just 15% of all journey purposes by all modes of travel. It is considered that the mode of travel associated with other common journey purposes such as education / escort education (13%), shopping (19%), personal business (9%) and leisure (26%) is likely to be different to how people choose to travel to work; especially given the proximity of the site to the adjacent supermarket and various primary schools.

6.5.7 Given the above, it is considered that the use of TRICS to establish a modal split is a valid approach and that the results of the assessment are representative of how people will travel to and from the development as a whole, not just to and from work.

6.5.8 Using the multimodal TRICS data for the 'Privately Owned Flats' element of the development, the predicted modal split is detailed in Table 17. It should be noted that the available TRICS data for the 'Affordable Flats' element of the development does not provide enough detail to determine a split between the various public transport modes. Nevertheless, the split identified by the 'Privately Owned Flats' data is considered representative.

	Mode of Travel	Modal Share			Two-way Trip Generation		
		AM	PM	Total	AM	PM	Total
Active Transport	Pedestrians	34%	33%	43%	69	58	926
	Cyclists	1%	2%	1%	2	4	18
Private Transport	Taxis	4%	1%	3%	7	2	62
	Cars	3%	9%	5%	7	16	103
	LGV	1%	1%	1%	2	1	30
	OGV	0%	0%	0%	0	0	2
	Motorcycles	0%	0%	0%	0	0	6
	Vehicle Passengers	0%	2%	1%	0	3	25
Public Transport	Underground	28%	23%	21%	57	41	443
	Overground	5%	4%	3%	11	7	71
	Bus	24%	26%	21%	49*	45*	458*
	Total People	100%	100%	100%	203	177	2154

Table 17 – Predicted modal split based on multimodal TRICS data

6.5.9 As noted by TfL, those travelling on the Underground will likely travel to / from the station by bus. Therefore, the total number of people travelling by bus is estimated to be in the order of 106 people in the AM peak period, 86 people in the PM peak period and 901 people daily.

6.6 Comparison of results

6.6.1 The following tables provide a comparison between the modal split predictions associated with each assessment methodology as well as the resulting trip generations:

Method of Travel	2011 Census 'Method of Travel to Work' modal split %	TRICS data 'Daily' modal split %
Underground, Metro, Light Rail, Tram	32.7%	21%
Train	27.1%	3%
Bus, Minibus or Coach	11.3%	21%
Taxi	0.3%	3%
Motorcycle, Scooter or Moped	2.5%	0%
Driving a Car or Van	2.9%	5%
Passenger in a Car or Van	0.1%	1%
Bicycle	8.9%	1%
On Foot	13.0%	43%
Other Method of Travel to Work	1.2%	0%

Table 18 – Modal Split % Comparison

6.6.2 With regards to the impact on trip generations, a comparison is provided below:

Method of Travel	2011 Census 'Method of Travel to Work' trip generations	TRICS data 'Daily' trip generations
Underground, Metro, Light Rail, Tram	797	443
Train	661	70
Bus, Minibus or Coach	275	458
Taxi	8	62
Motorcycle, Scooter or Moped	61	6
Driving a Car or Van	71	134
Passenger in a Car or Van	3	25
Bicycle	217	18
On Foot	317	926
Other Method of Travel to Work	28	0
Bus and Underground	1072	901

Table 19 – Trip Generation Comparison

6.6.3 From the above it can be seen that there are material differences in predicted modal splits for almost all modes of travel. It is considered that this appropriately reflects how travel modes vary depending upon journey purpose.

6.6.4 The 'Travel to Work' estimations rely more heavily on public transportation, in particular the rail and underground network, which makes sense because most people do not live within a reasonable walking distance from their workplace. In comparison, the TRICS data, which account of all journey purposes, predicts a much greater proportion of people travelling on foot. Given the range of education, leisure and retail opportunities available within reasonable walking distance of the site it is understandable that people are likely to be less reliant upon public transportation.

6.6.5 For the purpose of providing a robust assessment of the impact of the Amended Proposed Development on pedestrian infrastructure as well as on public transport services, it is proposed to use the generations resulting from TfL's assessment methodology. Further details are provided within Chapters 9 – 11 of this report.

7 Vehicle Traffic Generations

7.1 Trip Generations

7.1.1 Notwithstanding the different methodologies described in the previous Chapter of this report, the original Transport Assessment identified no material junction capacity issues surrounding the development proposals. Therefore, for the purpose of this Revised Transport Assessment, the vehicle trips associated with the proposed development have been assessed using vehicle trip rates from the TRICS database which have not been filtered to exclude sites based on parking ratios, as per TfL's request. These trip rates are presented within the multimodal outputs in Appendix H & I and are summarised below:

	Trip Rate Per Dwelling		Traffic Generations from 280 Units		
	Arrivals	Departures	Arrivals	Departures	Total
AM Peak (08:00-09:00)	0.032	0.081	9	23	32
PM Peak (17:00-18:00)	0.054	0.031	15	9	24

Table 20 – Traffic generations for private residential element (280 units)

	Trip Rate Per Dwelling		Traffic Generations from 173 Units		
	Arrivals	Departures	Arrivals	Departures	Total
AM Peak (08:00-09:00)	0.027	0.078	5	13	18
PM Peak (17:00-18:00)	0.054	0.038	9	7	16

Table 21 – Traffic generations for affordable residential element (173 units)

7.1.2 The predicted residential vehicle trips are 50 vehicle movements two-way in the AM and 40 in the PM peak hours. This equates to approximately one vehicle every 1½ to 2 minutes in the AM and PM peak hours.

7.1.3 Providing complementary amenities within the site will reduce the need for residents to travel off site for the same facilities and traffic flows could be expected to be lower than at comparative residential development sites without convenience facilities on site.

7.1.4 At this stage, the exact uses of the commercial space within the development have not yet been confirmed. However, it is understood that this could be a mix of A1/A2 retail outlets and B1 office.

7.1.5 To provide an initial assessment the TRICS land use category '01 Retail – I Shopping Centre Local Shops' has been utilised. It is considered that whilst this category may not necessarily be exactly representative of the development proposals, it is the most appropriate land use category available within the TRICS database.

7.1.6 The table below shows the trip rates and associated traffic generations based on the available sites with the full report included at **Appendix L**;

	Time Period	Trip Rates (per 100m² GFA)		Traffic Generations		
		Arrivals	Departures	Arrivals	Departures	Two-way
Commercial Space (495m²)	AM (08:00-09:00)	5.180	4.773	26	24	50
	PM (17:00-18:00)	6.369	6.933	32	34	66

Table 22 - Trip rates and generations for proposed commercial use

7.1.7 It is considered that the generations identified in the table above are wholly unrealistic and in reality are unlikely to be realised at the proposed development site. This is due to no on-site parking provision associated with the commercial element of the development combined with TRO's along Manor Road which prohibit on-street car parking. In addition, the modest size of the proposed commercial areas means it is unlikely that trips would be drawn from further-a-field and use of the retail space is likely to be by pass-by trips.

7.1.8 Taking this into account the trip generations are envisaged to be as detailed in the table below:-

	Time Period	Traffic Generations		
		Arrivals	Departures	Two-way
Commercial Space (495m²)	AM (08:00-09:00)	6	6	12
	PM (17:00-18:00)	8	8	16

Table 23 - Trip generations for proposed commercial use with reductions applied

7.1.9 This equates to approximately one vehicle every 4 - 5 minutes in the AM and PM peak hours.

7.2 Total Traffic Generations

7.2.1 Following the above assessments, the total vehicle trip generations associated with the development proposals can be summarised as follows:-

Time Period	Land Use	Traffic Generations		
		Arrivals	Departures	Two-way
AM	Private Flats	9	23	32
	Affordable Flats	5	13	18
	Commercial	6	6	15
	Total	**20**	**42**	**62**
PM	Private Flats	15	9	24
	Affordable Flats	9	7	16
	Commercial	8	8	18
	Total	**32**	**24**	**56**

Table 24 - Total proposed development vehicle trip generations

7.2.2 Taking into consideration the existing use of the development site, described in Table 2, the proposed development could be expected to result in a reduction of 17 traffic movements in the AM peak and 51 in the PM peak.

7.3 Development Traffic Distribution

7.3.1 The distribution of the traffic generated by the residential element of the site has been predicted using the 'WU03EW - Location of usual residence and place of work by method of travel to work (MSOA level)' dataset from the 2011 Census. The site falls within Richmond upon Thames 004 MSOA which is illustrated overleaf.

Figure 12 – Richmond upon Thames 004 MSOA (MapItUK)

7.3.2 The traffic generated by the commercial element of the site has been distributed by the existing turning proportions of light vehicles at the site access.

7.3.3 The residential and commercial traffic distributions and resulting traffic flows, along with the total development traffic flows are included at **Appendix M**.

8 Traffic Impact Assessment

8.1 This section of the report seeks to quantify the impact of the Amended Proposed Development upon the operation of the local highway network.

8.2 Base Traffic Flows

8.2.1 Fully classified traffic counts of the site access and Sainsbury's supermarket access opposite were undertaken by Nationwide Data Collection Ltd on 2 October 2018.

8.2.2 A diagram showing the base traffic flows is included at **Appendix N**.

8.3 Committed Development

8.3.1 During the pre-application discussions on the November 2019 Amendments no committed development sites were identified.

8.4 Traffic Growth

8.4.1 The traffic impact of the development has been assessed at the initial year of 2018, an opening year of 2024 and a design year of 2029.

8.4.2 Traffic growth factors have been generated utilising the latest version of TEMPRO (v7.2b), adjusted against Department for Transport's Road Traffic Forecasts 2018 Scenario 1 (RTF18) and updated National Trip End Model (NTEM). The growth factors used are shown below:

2018 to 2024	AM	1.0526	**2018 to 2029**	AM	1.0898
	PM	1.0519		PM	1.0900

8.4.3 Diagrams showing the base traffic flows growthed to 2024 and 2029 are included at **Appendix N**.

8.5 Junction Modelling

8.5.1 Detailed junction capacity modelling has been undertaken using Junctions software. Both the site access and the access to Sainsbury's supermarket opposite have been modelled in the 2024 and 2029 future years.

Site Access priority junction

8.5.2 The results of this assessment are summarised as follows;

Arm A = Manor Road (S)

Arm B = Site Access

Arm C = Manor Road (N)

	2018 Base AM		2018 Base PM	
	Max RFC	Max Queue (veh)	Max RFC	Max Queue (veh)
B-AC	0.10	0.1	0.15	0.2
C-B	0.08	0.1	0.08	0.1

	2024 Base + Dev AM		2024 Base + Dev PM	
	Max RFC	Max Queue (veh)	Max RFC	Max Queue (veh)
B-AC	0.26	0.4	0.24	0.3
C-B	0.17	0.2	0.20	0.2

	2029 Base + Dev AM		2029 Base + Dev PM	
	Max RFC	Max Queue (veh)	Max RFC	Max Queue (veh)
B-AC	0.27	0.4	0.35	0.5
C-B	0.18	0.2	0.20	0.3

Table 25 – Junctions results

8.5.3 The output results can be found at **Appendix O**.

8.5.4 This shows that, even in the worst case situation of 2029 with development traffic, the junction would operate comfortably within its practical capacity, which is generally accepted as being represented by a ratio of flow to capacity (RFC) of 0.850.

Sainsbury's supermarket access priority junction

8.5.5 The results of this assessment are summarised as follows;

Arm A = Manor Road (N)

Arm B = Site Access

Arm C = Manor Road (S)

	2018 Base AM		2018 Base PM	
	Max RFC	Max Queue (veh)	Max RFC	Max Queue (veh)
B-C	0.07	0.1	0.18	0.2
B-A	0.14	0.2	0.18	0.2
C-AB	0.10	0.1	0.17	0.2

	2024 Base + Dev AM		2024 Base + Dev PM	
	Max RFC	Max Queue (veh)	Max RFC	Max Queue (veh)
B-C	0.07	0.1	0.19	0.2
B-A	0.15	0.2	0.19	0.2
B-C	0.11	0.1	0.18	0.2

	2029 Base + Dev AM		2029 Base + Dev PM	
	Max RFC	Max Queue (veh)	Max RFC	Max Queue (veh)
B-C	0.08	0.1	0.20	0.2
B-A	0.16	0.2	0.20	0.2
C-AB	0.11	0.1	0.19	0.2

Table 26 – Junctions results

8.5.6 The output results can be found at **Appendix P**.

8.5.7 This shows that, even in the worst case situation of 2029 with development traffic, the junction would operate comfortably within its practical capacity, which is generally accepted as being represented by a ratio of flow to capacity (RFC) of 0.850.

Southbound queues

8.5.8 As the total proposed traffic generations during the peak AM and PM hours are predicted to result in reductions when compared to the existing use of the site, it is considered that queues at the level crossing to the south would not be adversely affected by the proposals.

9 Impact of the Development on the Pedestrian Network

9.1 TfL's multimodal assessment methodology, detailed in Chapter 6 of this report used '2011 Census: Method of Travel to Work data' to form a modal split. However, as previously noted, there are other journey purposes to consider as well as Travel to Work (e.g. education and shopping). Furthermore, those using public transport modes are likely to require a short journey on foot in order to be able to access those services.

9.2 The multimodal trip generations set out within Table 13 of this report estimates that the development is likely to generate in the order of 34 pedestrian trips (two-way) in AM peak, 27 pedestrian trips (two-way) in the PM peak hour and 317 trips (two-way) daily.

9.3 Further to the above, those utilising public transport modes are expected to generate an additional pedestrian demand in the order of 188 trips (two-way) in the AM, 145 trips in the PM and 1,733 trips (two-way) daily. These journeys on foot would be limited to between the site and local bus stops / North Sheen Station.

9.4 The following assessment is based on data from the National Travel Survey and seeks to provide a realistic estimate of the distribution of pedestrian movement about the site and evaluate the suitability of existing crossing facilities.

- **Commuting:-** Trips to / from home to usual place of work
- **Business:-** Personal trips in course of work.
- **Education / Escort:-** Trips to school or college / Accompanying someone else (e.g. taking a child to school)
- **Shopping:-** Trips to the shops or from the shops to home.
- **Personal Business:-**Visits to services, medical consultations etc.
- **Visit friends:-** Trips to visit friends
- **Other leisure:-** Mostly entertainment, sport, holidays and day trips.

9.5 Just Walking (23%)

9.5.1 This journey purpose would account for around 73 trips (two-way) daily. This would include activities such as dog walking, walking / running for exercise etc. It is considered that these activities would predominantly occur outside of typical network peak periods.

9.5.2 With regards to distribution it is difficult to determine in what direction people would travel. As such a 50/50 split is to be assumed northbound / southbound along Manor Road (without the need to cross-over). The northbound proportion will then be evenly split between westbound and northbound movements at Manor Circus.

9.6 Education / Escort Education (21%)

9.6.1 This journey purpose would account for 67 trips (two-way) daily. The outbound journeys would likely occur on a morning during the typical AM peak period of 8am – 9am (with parents / guardians returning home after 9am), and in the afternoon between 3pm – 4pm, prior to the typical PM peak period 5pm – 6pm.

9.6.2 As part of the Health Impact Assessment undertaken for this scheme, the GLA's SPG Play Space Requirement Calculator was used to determine the child yield (aged up to and including 17) from the proposed development. The child yield from the proposed development is as detailed in the table below:-

Age of children	Number of children
Under 5	73
5-11 years	51
12 -17 years	24
Total	**148**

Table 26 – Proposed Development Child Yield

9.6.3 It is considered that those children walking (including being escorted) to / from school will be mostly primary school children (51 total). Those at secondary level and above are likely to have to travel further and are therefore included within the public transport user element of trips; the impact of which is still to be considered. On this basis, the estimation of 67 trips (two-way) associated with education appears to be reasonable.

9.6.4 With regards to distribution, schools within walking distance of the site include;

- Holy Trinity Primary School and Nursery (550m to the south)
- Marshgate Primary School (550m to the south)
- Darell Primary & Nursery School (550m to the north)
- Christ's School and Sixth Form (800m to the south)

9.6.5 It is estimated that 75% of journeys to / from school would be to the south of the site; of which 25% would cross Manor Road via the 0.8m wide pedestrian crossing refuge. The remaining 50% could continue along the western flank of Manor Road before utilising the controlled crossing facility at the junction with Sheen Rd (A305).

9.6.6 The 25% travelling northbound would utilise the zebra crossing facilities around the Manor Circus roundabout junction.

9.7 Shopping (19%)

9.7.1 This journey purpose would account for 60 trips (two-way) daily. It is considered that these activities would predominantly occur outside of typical network peak periods, with a small proportion coinciding with journeys home from work in the PM peak. Given the proximity a size of the adjacent supermarket, it is considered that most 'shopping' trips would be generated from there.

9.7.2 People travelling between the site and the supermarket would utilise the existing 2.0m wide pedestrian crossing refuge which is located immediately adjacent the access to the store.

9.8 Leisure (17%)

9.8.1 This journey purpose would account for 54 trips (two-way) daily. Again, it is considered that these trips would predominantly occur outside of typical network peak periods.

9.8.2 Local 'leisure' destinations are considered to include:

- Allotments to the south of North Sheen Station (200m south)
- North Sheen Recreation Ground (550m north)
- Old Deer Park / Kew Gardens (900m – 1.2km north/west)
- Richmond Park (within 1km)

9.8.3 With regards to distribution it is difficult to determine how popular each of the above locations will be. As such a 50 / 50 split is to be assumed northbound / southbound along Manor Road, with 10% crossing via the 0.8m wide pedestrian crossing refuge on Manor Road to access the allotments.

9.9 Personal Business (9%)

9.9.1 This journey purpose would account for 29 trips (two-way) daily. Again, it is considered that these trips would predominantly occur outside of typical network peak periods.

9.9.2 A number of things associated with 'Personal Business' are provided within the adjacent supermarket, including a pharmacy and banking facilities. The nearest Post Office is located approximately 800m to the south-west of the site along Sheen Road.

9.9.3 For the purpose of distribution for this assessment, and to be robust, all personal business trips are to be assigned to / from the supermarket via the 2.0m wide pedestrian crossing refuge adjacent the supermarket access.

9.10 Commuting (7%)

9.10.1 This journey purpose would account for 22 trips (two-way) daily; a material proportion of which would likely occur during network peak periods.

9.10.2 With regards to distribution, the surrounding area is predominantly residential, with the exception of the supermarket and various schools. The main employment areas are likely to be Richmond (west), Kew (north) and North Sheen (east). For the purpose of this assessment a split of 50/25/25 is to be applied, respectively.

9.11 Other including Business and Other Escort (4%)

9.11.1 These journey purposes would account for 13 trips (two-way) daily. There is unlikely to be a fixed or likely destination associated with these journeys as such the assignment of a distribution is difficult. However, it is considered that these trips would likely occur throughout the day (non-peak) or could be linked with a journey home in the PM peak.

9.12 Accessing Public Transport

9.12.1 As previously noted, those utilising public transport modes are expected to generate an additional pedestrian demand in the order of 188 trips (two-way) in the AM, 145 trips (two-way) in the PM and 1,733 trips (two-way) daily.

9.12.2 Pedestrian movements to / from North Sheen Station are expected to be in the order to 72 trips (two-way) in the AM, 55 trips (two-way) in the PM and 661 trips (two-way) daily. These movements would be required to cross Manor Road using the 0.8m wide pedestrian crossing refuge.

9.12.3 Pedestrian movements to / from Richmond Underground Station (via bus services along Lower Mortlake Road) are expected to be in the order of 86 trips (two-way) in the AM, 67 trips (two-way) in the PM and 797 trips (two-way) daily. Given the location of bus stop ‘SB’, outbound journeys (to Richmond Underground) would not require anybody to cross a road. Inbound journeys (arriving at bus stop ‘SA’) would require people to cross Lower Mortlake Road using the zebra crossing facilities at the manor Circus roundabout junction.

9.12.4 With regards to pedestrian movements to / from bus stops (specifically for bus journeys) are expected to be in the order of 30 trips (two-way) in the AM, 23 trips (two-way) in the PM and 275 trips (two-way) daily.

9.12.5 The majority of bus services operate along Lower Mortlake Road via the aforementioned bus stops 'SA' and 'SB', with a relatively even split between north-eastbound and south-westbound journeys. It is also acknowledged that a frequent service (371) is provided via stop 'SU' located within the adjacent supermarket car park. For the purpose of this assessment, 10% of bus journeys are to be assigned via bus stop 'SU' with the remaining 90% via stops 'SA' and 'SB'.

9.13 Pedestrian Impact Summary

9.13.1 The total number and distribution of daily pedestrian movements are illustrated within **Appendix Q**, and summarised in the following table:

Links

A = Southbound on Manor Road

B = Crossing Manor Road at 0.8m pedestrian crossing refuge

C = Crossing Manor Road at 2.0m pedestrian crossing refuge

D = Westbound on Lower Mortlake Road

E = Crossing Manor Road via Manor Circus zebra crossing facility

F = Crossing Lower Mortlake Road via Manor Circus zebra crossing facility

LINK ID	A	B	C	D	E	F
Daily	102	683	117	558	24	567

Table 27 – Summary of pedestrian movements

9.14 Review of Crossing Facilities

9.14.1 To determine the suitability of the existing crossing facilities, in particular those provided along Manor Road, guidance set out within Local Transport Note 1/95 'The Assessment of Pedestrian Crossings' has been reviewed.

9.14.2 The purpose of a crossing is to provide pedestrians with a passage across a carriageway. Each type of crossing has advantages and disadvantages; the type chosen should be appropriate to the circumstances of the site and the demand and behaviour of road users.

9.14.3 Details relating to the 'circumstances of the site' and 'behaviour of road users' are provided in the Site Assessment below;

9.15 Highway Description

9.15.1 The B353 Manor Road has one pedestrian crossing refuge approximately 20m south of the mid-point of the main pedestrian access to the site, which is approximately 1.6m wide and one 12m north of the secondary pedestrian access to the site which is 2m wide. There are chevrons to accommodate both of these established crossing points and maintain a carriageway width of 3m in both directions for vehicular traffic.

9.15.2 There is a carriageway length of 92m between the two crossing refuges and 24m between the smaller refuge and the railway level crossing, which can act as a pedestrian crossing facility when the barriers are down, and the pedestrian footbridge across the railway line on the eastern side of Manor Road.

9.15.3 LBRuT commented that "Current highway design standards state that there should be a carriageway length of at least 90m between signalised pedestrian crossing facilities, and that these should be considered when there is a gap in vehicular traffic to enable able-bodies pedestrians to cross two lanes of traffic of less than 5 seconds and a gap of less than 12 seconds for other groups of pedestrians." Firstly, it is noted that the pedestrian crossing facilities on Manor Road are not signal controlled. However, the distance between the two refuges is still greater than 90m.

9.15.4 The road is surfaced, providing adequate skid resistance for vehicles and street lighting is provided in accordance with standards for built-up areas.

9.15.5 Manor Road has a relatively straight alignment and Traffic Regulation Orders (TROs) in the form of double yellow lines are present on both sides of the carriageway preventing on-street parking. As such, adequate visibility is considered to be available between pedestrians and vehicles in relation to the 30mph speed limit of the road.

9.16 Existing Traffic Flows

9.16.1 Traffic surveys undertaken along Manor Road in October 2018 identified that two-way vehicle flows were in the order of 623 vehicles in the AM peak period and 741 vehicles in the PM. The recorded HGV percentages were 4.2% in the AM and 2.7% in the PM.

9.16.2 As the presence of the pedestrian crossing refuges allows pedestrians to cross the road in two stages, pedestrians must only give-way to one direction of vehicle traffic at a time. Assuming free-flow conditions, the northbound vehicles equate to (358) approximately 1 vehicle every 10 seconds in the AM peak and (442) approximately 1 vehicle every 8 seconds in the PM peak. Meanwhile, southbound vehicles equate to (265) approximately 1 vehicle every 14 seconds in the AM peak and (299) approximately 1 vehicle every 12 seconds in the PM peak.

9.16.3 However, consideration must also be given to the presence of the railway level crossing and its impact on the flow of vehicle traffic.

9.16.4 As set out in Section 3.3 of this report, surveys of the level crossing identified that in the AM peak hour, the level crossing was activated 9 times resulting in the barrier being down for 37m 28s. In the PM peak hour this was 30m 38s over 11 activations. The typical duration for which the barriers were down was observed to be in the order of 3 to 4 minutes per crossing.

9.16.5 Whilst the operation of the crossing often results in vehicles travelling in platoons (with minimal gaps to allow pedestrians to cross), it also creates extended periods of time whereby pedestrians can cross the road without having to give-way to moving vehicles.

9.16.6 As part of the original TA, pedestrian surveys were undertaken identifying crossing movements along Manor Road. The study area and zones are illustrated below:

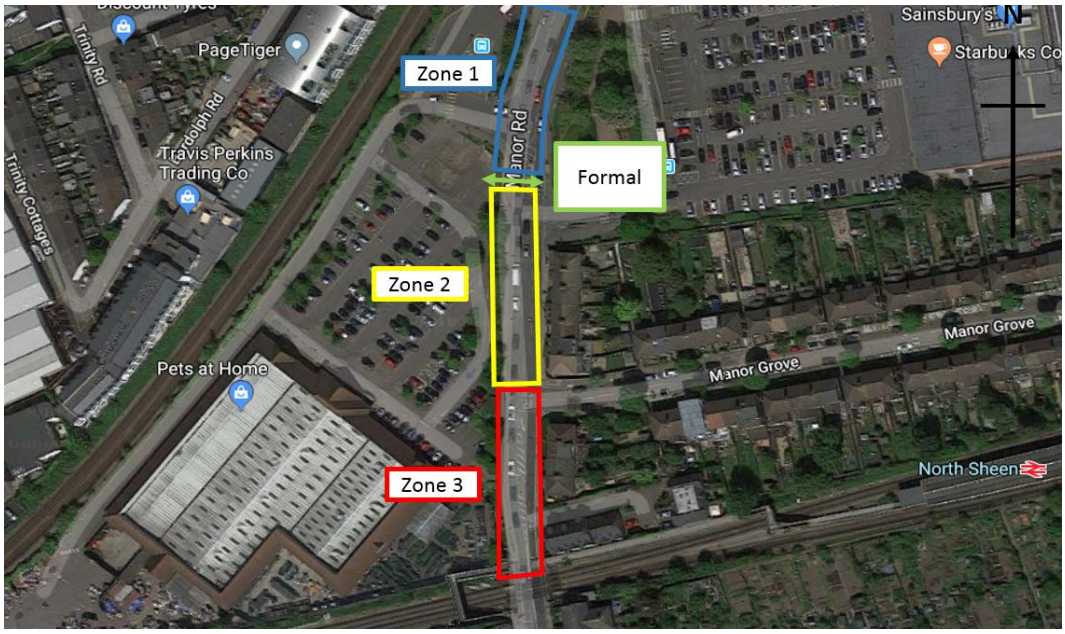


Figure 13 – Pedestrian survey study area

9.16.7 The results of the pedestrian survey are tabulated below:

TIME	Zone 1		Formal Crossing		Zone 2		Zone 3	
	EB	WB	EB	WB	EB	WB	EB	WB
07:30	5	1	1	5	0	4	16	9
07:45	5	1	3	2	1	5	29	30
08:00	0	1	1	2	1	14	17	34
08:15	0	2	0	6	3	1	19	27
08:30	3	2	4	4	2	8	14	61
08:45	2	1	3	1	4	3	20	19
09:00	2	2	3	3	3	3	39	6
09:15	3	3	2	0	2	5	10	1
P/TOT	**20**	**13**	**17**	**23**	**16**	**43**	**164**	**187**

Table 28 – AM Pedestrian survey results

TIME	Zone 1		Formal Crossing		Zone 2		Zone 3	
	EB	WB	EB	WB	EB	WB	EB	WB
15:00	5	4	1	4	5	4	17	17
15:15	3	4	17	6	1	3	22	9
15:30	2	2	9	4	5	6	25	2
15:45	1	0	5	2	4	9	21	11
16:00	6	6	5	1	6	2	11	12
16:15	2	3	8	6	1	2	19	9
16:30	6	3	15	5	1	1	16	10
16:45	2	4	5	1	4	4	19	13
17:00	3	1	3	0	4	2	9	5
17:15	2	1	4	3	1	2	12	7
17:30	1	5	1	3	1	3	7	16
17:45	8	2	2	2	5	8	15	10
P/TOT	**41**	**35**	**75**	**37**	**38**	**46**	**193**	**121**

Table 29 – PM Pedestrian survey results

9.16.8 The survey results identify that during both the AM and PM survey periods, there were significant levels of pedestrian activity. The pedestrian peak hours were 07:45 – 08:45 during which time a total of 302 crossings occurred, and 15:00 – 16:00 during which time a total of 230 crossings occurred. Over the course of the entire AM and PM survey periods, a total of 1,069 crossing movements were recorded.

9.16.9 What is also notable from the survey results is that more people were recorded crossing the road not at a crossing, than those recorded using a crossing. This would suggest that pedestrians typically have the opportunity to cross the full carriageway in one stage, rather than requiring refuge.

9.16.10 Based on the predicted level of pedestrian movements generated by the development set out earlier in this Chapter, the number of additional crossing movements along Manor Road equates to 800 movements daily.

9.17 Accident History

9.17.1 The Crashmap database has been reviewed to investigate the accident history along Manor Road in proximity to the site, specifically relating to incidents involving pedestrians. The following image shows all pedestrian related incidents that have been recorded in the 21 year period between 01/01/1999 and 31/12/2019.

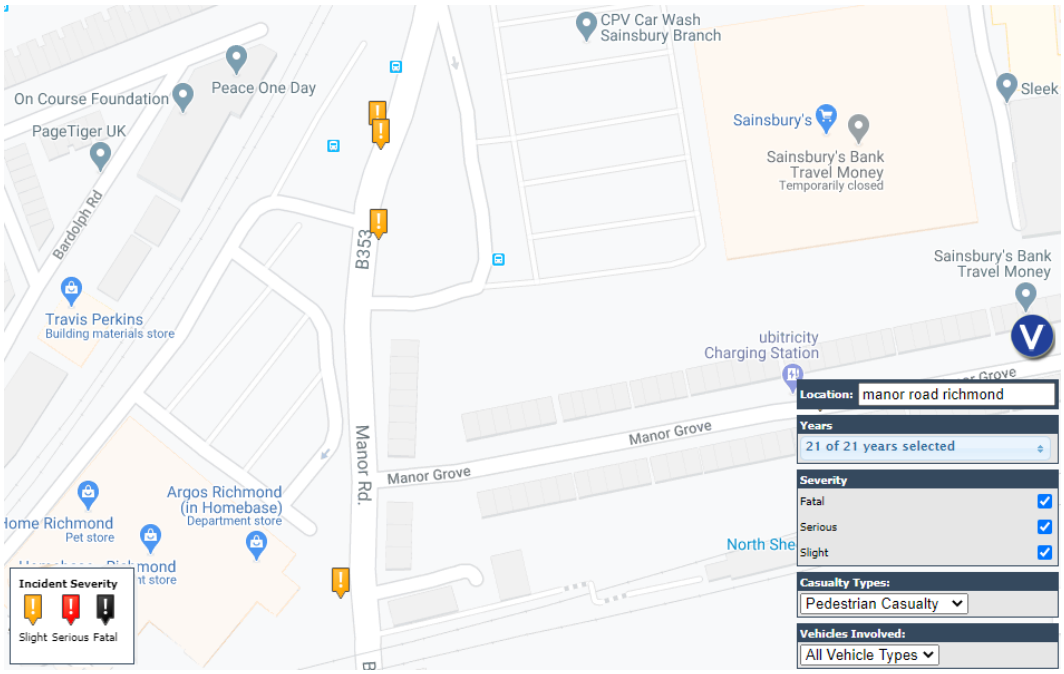


Figure 14 – Pedestrian Accident History ***[Crashmap]***

9.17.2 Crashmap indicates that just 4 pedestrian related incidents (all slight in severity) have been recorded in the last 20 years. Two events occurred approximately 30m north of the existing site entrance, one event occurred at the 2.0m wide pedestrian crossing refuge and one occurred between the 0.8m wide pedestrian crossing refuge and the level crossing.

9.17.3 It is considered that the number of recorded pedestrian related incidents (4) over a period of 20 years is particularly low, especially given the surveyed volume of pedestrian crossing movements. This would indicate that the existing relationship between pedestrian and vehicle movements is a manageable one and that the existing crossing facilities do not require upgrading. Furthermore, the forecast increase in pedestrian movements as a result of the proposed development is unlikely to have a material adverse effect on road safety.

9.17.4 The pedestrian refuge island widths provided on Manor Road (2.0m and 1.6m with hatching to either side) comply with current design standards and are considered satisfactory to accommodate the proposed level of pedestrian activity.

10 Impact of the Development on Local Bus Services

10.1 Based on TfL's assessment methodology, it is identified (in Table 13) that the additional demand for buses which could potentially be generated by the proposed development equates to around 116 people in the AM peak period, 90 people in the PM peak period and 1,072 people daily. These figures include all those using a bus to access Richmond Underground Station.

10.2 The above estimate is considered robust because (as noted by the Council) there are schools (primary and secondary) and higher education establishments within acceptable walking distance of the site. As such, pupils are unlikely to be dependent upon bus services to access education. Furthermore, the site is located immediately adjacent a supermarket (with Pharmacy); therefore journeys for the purposes of shopping are unlikely to require access to bus services.

10.3 TfL have advised that a number of alterations to the bus services in the vicinity of the site came into effect on 12th December 2020. The changes were made in order to address areas of surplus capacity and to reallocate resources where additional capacity is needed in Richmond, Twickenham and Whitton. The alterations are summarised below:

- Route H37 frequency reduced from 10bph to 8bph.
- Route 493 terminates at Richmond Bus Station rather than at Richmond Manor Circus. However, whilst route 493 will no longer serve Manor Circus, it will continue to service the south side of the site from East Sheen (albeit a longer walk time).
- Route H22 will no longer operate between Richmond and Twickenham
- Route 391 will be renumbered to 110.

10.4 The following bus routes still serve (within 640m) the application site: 371 and R70 (Manor Road), 110, 190, 419, H37, R68 and N22 Manor Circus and 33, 337, 493 and N33 (at East Sheen).

10.5 Given the anticipated increase in demand (116 people in the AM peak period, 90 people in the PM peak period and 1,072 people daily) and the number of available bus services per hour (41), the number of additional people using each service would likely be modest; in the order of 2 or 3 people. This is considered unlikely to have a material adverse effect on existing bus capacity.

10.6 It is noted that, with the revised services, TfL remain satisfied that there is sufficient spare capacity on the bus network to accommodate the uplift in bus demand generated by the development.

10.7 With regards to the peak hour direction of travel for bus trips, we have analysed 2011 Census: Origin / Destination statistics which identifies place of work by method of travel to work. Again, it is acknowledged that bus journeys will be undertaken for other journey purposes as well as 'travel to work'. However, for the purpose of distribution, this dataset is considered to be appropriate.

10.8 The figure overleaf depicts the Middle Super Output Area (MSOA) destination of journeys to work by bus from the MSOA of the site and the general direction of travel they would take based on Census data. As can be seen, there is a relatively even distribution between south-westbound and north-eastbound bus journeys to / from work. The split has been calculated as follows:

Direction of travel	Number of Travel to Work Journeys by Bus from 'Richmond 004'	% Split
South-westbound	124	53.7
North-eastbound	107	46.3

Table 30 - Direction of bus travel based on 2011 Census statistics

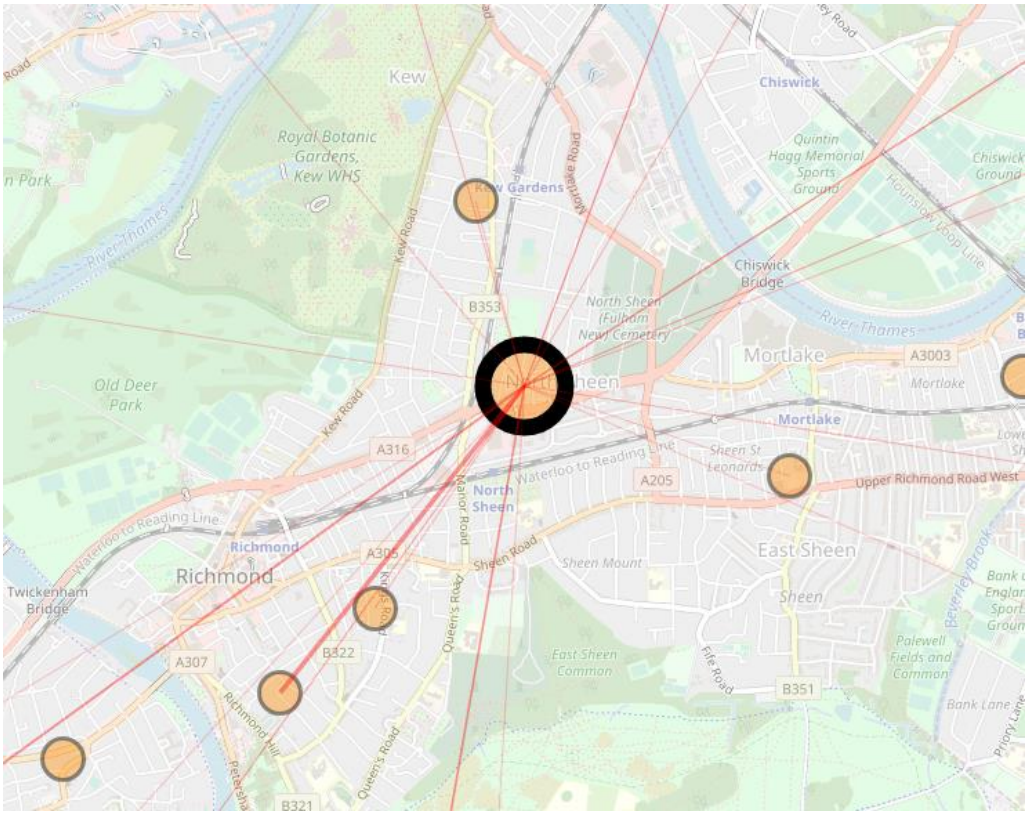


Figure 15 - Travel by bus ***(Source: http://commute.datashine.org.uk)***

10.9 It should be noted that for the purpose of this assessment; areas generating less than 6 bus trips have been omitted. This is considered to be appropriate as the impact of these low generating areas on distribution would be minimal. The dataset identifying the percentage draw to each area is included at **Appendix R**.

10.10 The relatively even distribution of bus journeys to / from work supports the assertion that an excessive demand on a particular bus service is unlikely to occur as a result of the development proposals.

11 Impact of the Development on Local Rail Services

11.1 Given its proximity to the site, it is considered the vast majority of rail users generated by the development will access the rail network via North Sheen Station.

11.2 During the consideration of application 19/0510/FUL, the 'Original Proposed Development', the matters of potential platform congestion and the availability of space on trains to London, particularly during the AM peak were raised.

11.3 In order to be able to consider this in greater detail and to enable a development impact assessment to be undertaken, surveys were undertaken at North Sheen Station on three neutral weekdays; Tuesday 8, Wednesday 9 and Thursday 10 October 2019 between the hours of 07:00-09:30 and 15:00-18:00. Due to camera failure during the 10 October survey Thursday 24 October was surveyed for comparison.

11.4 The results of the surveys (detailed in Section 3.6 and attached at Appendix C) revealed that on a typical neutral weekday the morning "peak" occurs between 07:30 and 08:30 when an average of 262 passengers enter the station.

11.5 As there is only a single point of entry linking to a central platform it is not known for certain which direction passengers are intending to travel in. However, it is noted that trains from North Sheen towards central London (Waterloo) are available on both west and east bound lines with varying journey times and number of stops.

11.6 In this "peak" period 8 trains are scheduled to stop at North Sheen which provide access to London Waterloo and varying station en-route. Some trains provide an option to change at Richmond to catch a faster onward train.

11.7 It is, therefore, considered that typically these 8 services would need to be able to accommodate, on average 33 passengers each. Bearing in mind that the South Western Rail trains on this line usually operate between 8 and 10 carriages during peak times this is not considered to be unreasonable.

11.8 It is identified (in Table 13) that the additional demand for rail services which could potentially be generated by the proposed development equates to around 72 people in the AM peak period, 55 people in the PM peak period and 661 people daily.

11.9 Based on the above, it is considered the development could result in an increase of circa 7 – 9 people per service, or an additional 1 person per carriage, during the peak periods.

11.10 It is considered that this level of increase would not have a material impact on the capacity of local rail services and in reality the additional demand would not be discernible amongst typical daily fluctuations.

11.11 From analysis of the pedestrian survey which recorded activity at the entrance/exit at North Sheen Station it is considered that existing rail passengers can be accommodated on peak hour services. Further analysis of the predicted uplift also indicates that the station and attending trains will be able to accommodate future passenger levels during peak hours.

11.12 There have been recent rail improvements including the introduction of new trains which has increased the available capacity of the trains on key routes in south-west London. In addition, Network Rail has also improved/realigned the platforms at Waterloo Station which now means that all 24 platforms are able to be used for South Western train services thus increasing the available services and reliability.

12 Comparison of Proposals

12.1 This chapter of the Transport Assessment Addendum provides a comparison of the Original Proposed Development (Feb 2019) and the Amended Proposed Development (July 2020), and their associated assessments.

12.2 The proposed changes are described in detail in the Design and Access Statement Addendum (July 2020), however, of particular note is the increase in residential units from 385 within the Original Proposed Development to 453 within the Amended Proposed Development. This increases the total number of affordable units by 39 to a total of 173 affordable homes (40% by habitable room taking account of grant funding, increased from 35% as originally submitted). This increase in units and the higher affordable housing provision has been principally achieved through amendments to the height and internal layout in appropriate locations across the Site.

12.3 From a Traffic and Transportation perspective, a comparison of the salient points is provided below;

	Original Proposed Development (Feb 2019)	Amended Proposed Development (July 2020)
Total Homes	385	453
Private	253	280
Affordable	132	173
Commercial	480.1m²	495m²
Accessible Car Parking	14	14
Long Stay Cycle Parking	840	817
Short Stay Cycle Parking	35	37

Table 31 – Summary of Changes

12.4 It should be noted that as part of the Original Proposed Development, 720 of the 840 long stay cycle parking spaces were proposed within a basement storage area. The Amended Proposed Development provides all cycle parking facilities at ground floor level.

12.5 With regards to the comparative impact of the proposals, this can be summarised as follows:

12.6 Accident history

12.6.1 The accident history on the local highway network has improved since the original Transport Assessment was undertaken. There have been no emergent accident trends that require further consideration, or that are likely to be exacerbated by the Amended Proposed Development.

12.7 Multimodal trip generations

Method of Travel	TfL Methodology		
	Original Proposed Development	Amended Proposed Development	+/-
Underground, Metro, Light Rail, Tram	667	797	+130
Train	553	661	+108
Bus, Minibus or Coach	230	275	+45
Taxi	6	8	+2
Motorcycle, Scooter or Moped	51	61	+10
Driving a Car or Van	59	71	+12
Passenger in a Car or Van	3	3	+0
Bicycle	182	217	+35
On Foot	265	317	+52
Other Method of Travel to Work	24	28	+4
Bus and Underground	897	1072	+175

Table 32 – Daily Trip Generation Comparison (TfL Methodology)

Method of Travel	SA Methodology		
	Original Proposed Development	Amended Proposed Development	+/-
Underground, Metro, Light Rail, Tram	368	443	+75
Train	58	70	+12
Bus, Minibus or Coach	380	458	+78
Taxi	51	62	+11
Motorcycle, Scooter or Moped	5	6	+1
Driving a Car or Van	112	134	+22
Passenger in a Car or Van	21	25	+4
Bicycle	15	18	+3
On Foot	768	926	+158
Other Method of Travel to Work	0	0	+0
Bus and Underground	748	901	+153

Table 33 – Daily Trip Generation Comparison (SA Methodology)

12.8 Impact on pedestrian network

12.8.1 The following table provides a comparison of the predicted daily pedestrian flows on various links on the local highway network.

Links

A = Southbound on Manor Road

B = Crossing Manor Road at 0.8m pedestrian crossing refuge

C = Crossing Manor Road at 2.0m pedestrian crossing refuge

D = Westbound on Lower Mortlake Road

E = Crossing Manor Road via Manor Circus zebra crossing facility

F = Crossing Lower Mortlake Road via Manor Circus zebra crossing facility

LINK ID	Original Proposed Development	Amended Proposed Development	+/-
A	85	102	+17
B	571	683	+112
C	98	117	+19
D	467	558	+91
E	20	24	+4
F	474	567	+93

Table 34 – Comparison of impact on pedestrian network

12.8.2 Despite the predicted increase in pedestrian movements on the local highway network, in particular the additional 131 daily pedestrian movements that are likely to utilise the pedestrian crossing refuges on Manor Road; given the absence of any existing pedestrian related accident trends, it is considered that no significant adverse impact on highway safety is likely to occur as a result of the increased demand.

12.9 Impact on local bus services

12.9.1 The following table identifies the predicted demand on local bus services generated by the Original Proposed Development and Amended Proposed Development, based on TfL assessment methodology. The predicted demands include those who are likely to use buses in order to access the Underground services.

	Original Proposed Development	Amended Proposed Development	+/-
AM Peak	98	116	+18
PM Peak	76	90	+14
Daily	897	1072	+175

Table 35 – Comparison of impact on local bus services

12.9.2 Following the changes to bus services, it is understood that there are now 41 bus services per hour provided via the stops in proximity to the site.

12.9.3 Based on TfL's recent review of bus services which identified that several local services were operating with spare capacity, and that the existing services were sufficient to meet demand, it is considered that the additional demand for bus services generated by the Amended Proposed Development would have no material adverse impact on the capacity of local services.

12.10 Impact on local rail services

12.10.1 The following table identifies the predicted demand on local rail services generated by the Original Proposed Development and Amended Proposed Development, based on TfL assessment methodology.

	Original Proposed Development	Amended Proposed Development	+/-
AM Peak	60	72	+12
PM Peak	47	55	+8
Daily	553	661	+108

Table 36 – Comparison of impact on local rail services

12.10.2 It is considered that the additional demand generated by the Amended Proposed Development would equate to an additional 1 – 2 passengers per service during peak periods. This modest increase is unlikely to have a significant adverse impact on the capacity of existing rail services.

12.11 Vehicle trip generations

12.11.1 The predicted peak hour vehicle trip generations associated with the residential element of the Original Proposed Development and Amended Proposed Development are summarised below. The predicted commercial vehicle trip generations have not been compared as there is no discernible difference in the proposed GIA's, as such no changes to the traffic flows would occur.

Time Period	Arrivals	Departures	Two-way
AM	12	31	42
PM	21	13	34

Table 37 – Original Proposed Development Peak Hour Vehicle Trips

Time Period	Arrivals	Departures	Two-way
AM	14	36	50
PM	25	15	40

Table 38 – Amended Proposed Development Peak Hour Vehicle Trips

12.11.2 Despite the comparative increase of 8 vehicle trips (two-way) in the AM peak period and 6 vehicle trips (two-way) in the PM peak period, the Amended Proposed Development is still expected to result in a reduction of 17 traffic movements in the AM peak and 51 in the PM peak when compared against the site's existing vehicle trip generation potential. As such, the proposal remains to result in a betterment on the operation of the local highway network.

13 Summary and Conclusions

13.1 This Transport Assessment Addendum has been prepared by Sanderson Associates (Consulting Engineers) Ltd on behalf of Avanton Richmond Development Ltd ('the Applicant') to reflect changes to the layout of the site (84 Manor Road, North Sheen) due to an amendment to the red line boundary.

13.2 The London Plan (2021) notes that; *"Car-free development should be the starting point for all development proposals in places that are (or are planned to be) well-connected by public transport".* The maximum residential parking standards state that for all higher density new developments that are in more accessible locations in areas within Outer London boroughs with a PTAL rating of 4 the maximum provision is 0.5 spaces per dwelling.

13.3 Therefore, on-site parking is limited to fourteen (3%) disabled spaces with the capability to increase this to 10% if required. 20% of these spaces will be provided with electric vehicle charging facilities in line with the London Plan requirements. Two Electric Car Club vehicles are to be provided within the development. These will be managed by the operators of the scheme who are to be confirmed in due course with the provision being secured via a S106 obligation.

13.4 Cycle parking is proposed in excess of the standards contained within the London Plan and in order to increase accessibility for residents and in response to comments from statutory consultees the cycle parking has been relocated from the basement to the ground floor of residential blocks.

13.5 As part of the proposals, improvements are to be made to the footway along the site frontage including widening and planting of trees and shrubs.

13.6 A detailed assessment of the surrounding highway network and public transport infrastructure has been undertaken and it is considered that the site is highly accessible by both active and public transport. As such, residents, staff and visitors to the development will have a choice of sustainable travel options which will reduce the need to travel by car.

13.7 From analysis of the pedestrian survey which recorded activity at the entrance/exit at North Sheen Station it is considered that existing rail passengers can be accommodated on peak hour services. Further analysis of the predicted uplift also indicates that the station and attending trains will be able to accommodate future passenger levels during peak hours.

13.8 In line with the strategies incorporated into the London Plan 2021 and additional guidance published by TfL a detailed Active Travel Zone assessment has been undertaken. The routes assessed, which had been previously agreed with TfL, generally performed well in relation to the Healthy Streets indicators by providing safe places to cross, being well-maintained, not having an accident history of concern and having public and private areas of vegetation that provide interest and variety. In addition, it is considered that the development will enhance the routes along the site frontage by providing improved footways, landscaping, places to rest and overlooking buildings.

13.9 It is therefore considered that, as the development site is situated in a highly accessible area, the virtually car-free proposals are in conformity with the current policies adopted by LBRuT, and also satisfy the future aspirations of the London Plan.

13.10 A number of financial contributions were previously agreed in relation to the Original Proposed Development and it is understood that these will be similarly applicable to the Amended Proposed Development. These are to be secured by a S106 Agreement and include:-

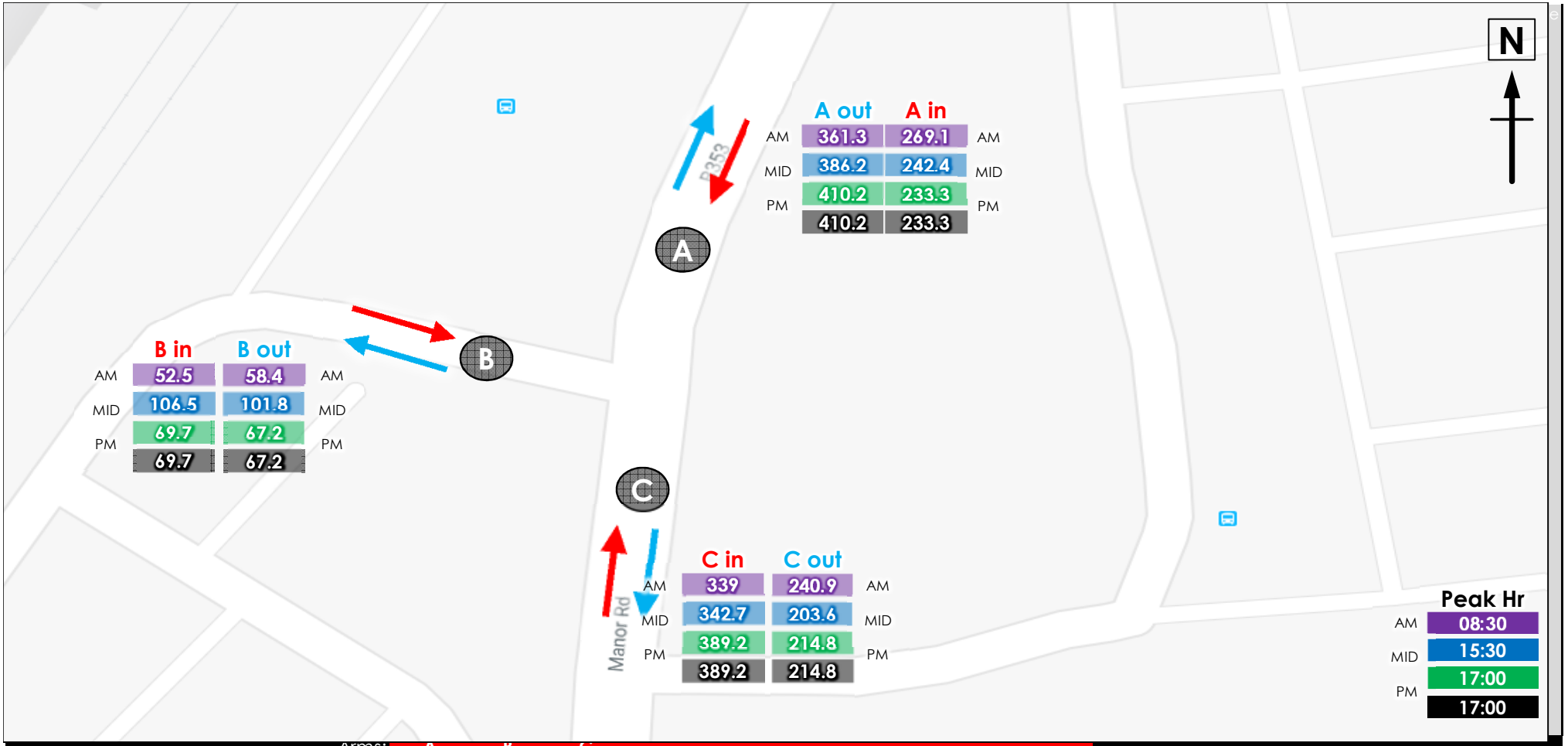
- Manor Circus Improvement Scheme £330,000
- Railway Safety £ 15,000
- Level Crossing Improvements £ 60,000
- Station Access Feasibility £ 30,000
- Controlled Parking Zone Study £ 50,000
- Controlled Parking Zone Amendments £ 50,000 (if deemed necessary)

13.11 During more recent pre-application discussions it has been established that the scheme design costs for Manor Circus have risen. Therefore, TfL have requested a revised financial contribution of £380,000 towards the implementation of the Manor Circus scheme. This revised contribution sum has been agreed by the developer. A further contribution of £40,000.00 has also been agreed towards improvements within North Sheen station.

13.12 It is therefore, considered that the Amended Proposed Development, complies the current policies adopted by LBRuT, and also satisfies the future aspirations of the London Plan. It is further considered that appropriate mitigation is proposed either within the parameters of the development itself or in the form of financial contributions and that there are no transportation related reasons why the development should not be allowed to proceed.

APPENDIX A

Traffic Count Data



Arms: A B C

Site / Location:	1	Manor Road / Retail Park Access	Project No:	9256	Drawing No:	9256 - 01	Drawn By:	MB
Survey Date:	02/10/2018		Project Name:	MANOR ROAD, RICHMOND				
Survey Times:	from: 07:30 15:00 to: 09:30 18:00		Drawing Title:	Junction Labels and Peak Hr PCU's				

SITE: **1**
LOCATION: Manor Road / Retail Park Access
TOTAL ARMS: A B C

from arm: **A**
to arm: **A**

period I period II
from: 07:30 15:00
to: 09:30 18:00

DATE: 02/10/2018
DAY: Tuesday

per quarter of an hour

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		00:15	00:15	00:15	00:15	00:15	00:15	00:15			00:15	00:15
07:30	**07:45**	0	0	0	0	0	0	0			**0**	0
07:45	08:00	0	0	0	0	0	0	0			**0**	0
08:00	08:15	0	0	0	0	0	0	0			**0**	0
08:15	08:30	0	0	0	0	0	0	0			**0**	0
08:30	**08:45**	0	0	0	0	0	0	0			**0**	0
08:45	09:00	0	0	0	0	0	0	0			**0**	0
09:00	09:15	0	0	0	0	0	0	0			**0**	0
09:15	09:30	0	0	0	0	0	0	0			**0**	0
15:00	15:15	0	0	0	0	0	0	0			**0**	0
15:15	15:30	0	0	0	0	0	0	0			**0**	0
15:30	**15:45**	0	0	0	0	0	0	0			**0**	0
15:45	16:00	0	0	0	0	0	0	0			**0**	0
16:00	16:15	0	0	0	0	0	0	0			**0**	0
16:15	16:30	0	0	0	0	0	0	0			**0**	0
16:30	**16:45**	0	0	0	0	0	0	0			**0**	0
16:45	17:00	0	0	0	0	0	0	0			**0**	0
17:00	17:15	0	0	0	0	0	0	0			**0**	0
17:15	17:30	0	0	0	0	0	0	0			**0**	0
17:30	**17:45**	0	0	0	0	0	0	0			**0**	0
17:45	18:00	0	0	0	0	0	0	0			**0**	0
	P/TOT	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Period I Total:		0	0	0	0	0	0	0	0	0	**0**	0
Period II Total:		0	0	0	0	0	0	0	0	0	**0**	0

per hour

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU.h
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		01:00	01:00	01:00	01:00	01:00	01:00	01:00			01:00	01:00
07:30	**08:30**	**0**	**0**	**0**	**0**	**0**	**0**	**0**			**0**	0
07:45	08:45	0	0	0	0	0	0	0			**0**	0
08:00	09:00	0	0	0	0	0	0	0			**0**	0
08:15	09:15	0	0	0	0	0	0	0			**0**	0
08:30	**09:30**	**0**	**0**	**0**	**0**	**0**	**0**	**0**			**0**	**0**
08:45	09:45	0	0	0	0	0	0	0			**0**	0
09:00	10:00	0	0	0	0	0	0	0			**0**	0
09:15	10:15	0	0	0	0	0	0	0			**0**	0
15:00	16:00	0	0	0	0	0	0	0			**0**	0
15:15	16:15	0	0	0	0	0	0	0			**0**	0
15:30	**16:30**	**0**	**0**	**0**	**0**	**0**	**0**	**0**			**0**	**0**
15:45	16:45	0	0	0	0	0	0	0			**0**	0
16:00	17:00	0	0	0	0	0	0	0			**0**	0
16:15	17:15	0	0	0	0	0	0	0			**0**	0
16:30	**17:30**	**0**	**0**	**0**	**0**	**0**	**0**	**0**			**0**	0
16:45	17:45	0	0	0	0	0	0	0			**0**	0
17:00	18:00	0	0	0	0	0	0	0			**0**	**0**
17:15	18:15	0	0	0	0	0	0	0			**0**	0
17:30	**18:30**	**0**	**0**	**0**	**0**	**0**	**0**	**0**			**0**	0
17:45	18:45	0	0	0	0	0	0	0			**0**	0
	P/TOT	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

SITE: **1**
LOCATION: Manor Road / Retail Park Access
TOTAL ARMS: A B C

from arm: **A**
to arm: **B**

period I period II
from: 07:30 15:00
to: 09:30 18:00

DATE: 02/10/2018
DAY: Tuesday

per quarter of an hour

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		00:15	00:15	00:15	00:15	00:15	00:15	00:15			00:15	00:15
07:30	**07:45**	1	0	1	0	1	0	0			**3**	4.5
07:45	08:00	3	1	0	0	3	0	0			**7**	10
08:00	08:15	2	1	0	0	2	0	0			**5**	7
08:15	08:30	8	1	0	0	3	0	0			**12**	15
08:30	**08:45**	4	0	0	0	2	0	0			**6**	8
08:45	09:00	4	1	0	0	0	0	1			**6**	5.2
09:00	09:15	6	0	0	0	2	0	0			**8**	10
09:15	09:30	6	5	0	0	2	0	1			**14**	15.2
15:00	15:15	10	0	0	0	2	0	0			**12**	14
15:15	15:30	12	0	0	0	3	1	0			**16**	18.4
15:30	**15:45**	15	1	0	0	3	1	1			**21**	22.6
15:45	16:00	9	0	0	0	3	0	1			**13**	15.2
16:00	16:15	16	0	0	0	1	0	0			**17**	18
16:15	16:30	2	2	0	0	4	0	0			**8**	12
16:30	**16:45**	9	2	1	0	3	0	0			**15**	18.5
16:45	17:00	5	1	0	0	0	0	0			**6**	6
17:00	17:15	7	0	0	0	3	0	0			**10**	13
17:15	17:30	6	0	0	0	2	0	0			**8**	10
17:30	**17:45**	6	0	0	0	1	0	0			**7**	8
17:45	18:00	8	0	0	0	2	0	0			**10**	12
	P/TOT	**139**	**15**	**2**	**0**	**42**	**2**	**4**	**0**	**0**	**204**	**242.6**
Period I Total:		34	9	1	0	15	0	2	0	0	**61**	74.9
Period II Total:		105	6	1	0	27	2	2	0	0	**143**	167.7

per hour

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU.h
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		01:00	01:00	01:00	01:00	01:00	01:00	01:00			01:00	01:00
07:30	**08:30**	**14**	**3**	**1**	**0**	**9**	**0**	**0**			**27**	36.5
07:45	08:45	17	3	0	0	10	0	0			**30**	40
08:00	09:00	18	3	0	0	7	0	1			**29**	35.2
08:15	09:15	22	2	0	0	7	0	1			**32**	38.2
08:30	**09:30**	**20**	**6**	**0**	**0**	**6**	**0**	**2**			**34**	**38.4**
08:45	09:45	16	6	0	0	4	0	2			**28**	30.4
09:00	10:00	12	5	0	0	4	0	1			**22**	25.2
09:15	10:15	6	5	0	0	2	0	1			**14**	15.2
15:00	16:00	46	1	0	0	11	2	2			**62**	70.2
15:15	16:15	52	1	0	0	10	2	2			**67**	74.2
15:30	**16:30**	**42**	**3**	**0**	**0**	**11**	**1**	**2**			**59**	**67.8**
15:45	16:45	36	4	1	0	11	0	1			**53**	63.7
16:00	17:00	32	5	1	0	8	0	0			**46**	54.5
16:15	17:15	23	5	1	0	10	0	0			**39**	49.5
16:30	**17:30**	**27**	**3**	**1**	**0**	**8**	**0**	**0**			**39**	47.5
16:45	17:45	24	1	0	0	6	0	0			**31**	37
17:00	18:00	27	0	0	0	8	0	0			**35**	**43**
17:15	18:15	20	0	0	0	5	0	0			**25**	30
17:30	**18:30**	**14**	**0**	**0**	**0**	**3**	**0**	**0**			**17**	20
17:45	18:45	8	0	0	0	2	0	0			**10**	12
	P/TOT	**139**	**15**	**2**	**0**	**42**	**2**	**4**	**0**	**0**	**204**	**242.6**

SITE: **1**
LOCATION: Manor Road / Retail Park Access
TOTAL ARMS: A B C

from arm: **A**
to arm: **C**

period I period II
from: 07:30 15:00
to: 09:30 18:00

DATE: 02/10/2018
DAY: Tuesday

per quarter of an hour

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		00:15	00:15	00:15	00:15	00:15	00:15	00:15			00:15	00:15
07:30	**07:45**	30	15	4	0	2	0	2			**53**	55.4
07:45	08:00	38	12	3	1	0	0	1			**55**	57
08:00	08:15	29	6	4	0	1	1	3			**44**	44
08:15	08:30	36	8	2	0	0	2	4			**52**	48.6
08:30	**08:45**	56	8	3	0	0	1	3			**71**	69.5
08:45	09:00	58	9	2	0	1	1	0			**71**	72.4
09:00	09:15	27	7	5	0	0	0	3			**42**	42.1
09:15	09:30	34	6	3	0	1	0	1			**45**	46.7
15:00	15:15	46	9	1	0	1	3	2			**62**	60.1
15:15	15:30	27	6	3	0	1	0	1			**38**	39.7
15:30	**15:45**	39	7	2	0	0	2	3			**53**	50.4
15:45	16:00	33	8	0	0	0	0	1			**42**	41.2
16:00	16:15	32	5	1	0	1	1	1			**41**	41.1
16:15	16:30	34	5	1	0	0	3	1			**44**	41.9
16:30	**16:45**	35	6	1	0	1	1	0			**44**	44.9
16:45	17:00	37	6	0	0	0	0	1			**44**	43.2
17:00	17:15	41	5	2	0	1	2	1			**52**	52
17:15	17:30	39	6	1	0	0	3	4			**53**	48.5
17:30	**17:45**	40	4	0	0	0	1	4			**49**	45.2
17:45	18:00	38	5	0	0	0	2	4			**49**	44.6
	P/TOT	**749**	**143**	**38**	**1**	**10**	**23**	**40**	**0**	**0**	**1004**	**988.5**
Period I Total:		308	71	26	1	5	5	17	0	0	**433**	435.7
Period II Total:		441	72	12	0	5	18	23	0	0	**571**	552.8

per hour

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU.h
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		01:00	01:00	01:00	01:00	01:00	01:00	01:00			01:00	01:00
07:30	**08:30**	**133**	**41**	**13**	**1**	**3**	**3**	**10**			**204**	205
07:45	08:45	159	34	12	1	1	4	11			**222**	219.1
08:00	09:00	179	31	11	0	2	5	10			**238**	234.5
08:15	09:15	177	32	12	0	1	4	10			**236**	232.6
08:30	**09:30**	**175**	**30**	**13**	**0**	**2**	**2**	**7**			**229**	**230.7**
08:45	09:45	119	22	10	0	2	1	4			**158**	161.2
09:00	10:00	61	13	8	0	1	0	4			**87**	88.8
09:15	10:15	34	6	3	0	1	0	1			**45**	46.7
15:00	16:00	145	30	6	0	2	5	7			**195**	191.4
15:15	16:15	131	26	6	0	2	3	6			**174**	172.4
15:30	**16:30**	**138**	**25**	**4**	**0**	**1**	**6**	**6**			**180**	**174.6**
15:45	16:45	134	24	3	0	2	5	3			**171**	169.1
16:00	17:00	138	22	3	0	2	5	3			**173**	171.1
16:15	17:15	147	22	4	0	2	6	3			**184**	182
16:30	**17:30**	**152**	**23**	**4**	**0**	**2**	**6**	**6**			**193**	188.6
16:45	17:45	157	21	3	0	1	6	10			**198**	188.9
17:00	18:00	158	20	3	0	1	8	13			**203**	**190.3**
17:15	18:15	117	15	1	0	0	6	12			**151**	138.3
17:30	**18:30**	**78**	**9**	**0**	**0**	**0**	**3**	**8**			**98**	89.8
17:45	18:45	38	5	0	0	0	2	4			**49**	44.6
	P/TOT	**749**	**143**	**38**	**1**	**10**	**23**	**40**	**0**	**0**	**1004**	**988.5**

SITE: **1**
LOCATION: Manor Road / Retail Park Access
TOTAL ARMS: A B C

from arm: **A**
to arm: **all**

period I period II
from: 07:30 15:00
to: 09:30 18:00

DATE: 02/10/2018
DAY: Tuesday

per quarter of an hour

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		00:15	00:15	00:15	00:15	00:15	00:15	00:15			00:15	00:15
07:30	**07:45**	31	15	5	0	3	0	2			**56**	59.9
07:45	08:00	41	13	3	1	3	0	1			**62**	67
08:00	08:15	31	7	4	0	3	1	3			**49**	51
08:15	08:30	44	9	2	0	3	2	4			**64**	63.6
08:30	**08:45**	60	8	3	0	2	1	3			**77**	77.5
08:45	09:00	62	10	2	0	1	1	1			**77**	77.6
09:00	09:15	33	7	5	0	2	0	3			**50**	52.1
09:15	09:30	40	11	3	0	3	0	2			**59**	61.9
15:00	15:15	56	9	1	0	3	3	2			**74**	74.1
15:15	15:30	39	6	3	0	4	1	1			**54**	58.1
15:30	**15:45**	54	8	2	0	3	3	4			**74**	73
15:45	16:00	42	8	0	0	3	0	2			**55**	56.4
16:00	16:15	48	5	1	0	2	1	1			**58**	59.1
16:15	16:30	36	7	1	0	4	3	1			**52**	53.9
16:30	**16:45**	44	8	2	0	4	1	0			**59**	63.4
16:45	17:00	42	7	0	0	0	0	1			**50**	49.2
17:00	17:15	48	5	2	0	4	2	1			**62**	65
17:15	17:30	45	6	1	0	2	3	4			**61**	58.5
17:30	**17:45**	46	4	0	0	1	1	4			**56**	53.2
17:45	18:00	46	5	0	0	2	2	4			**59**	56.6
	P/TOT	**888**	**158**	**40**	**1**	**52**	**25**	**44**	**0**	**0**	**1208**	**1231**
Period I Total:		342	80	27	1	20	5	19	0	0	**494**	510.6
Period II Total:		546	78	13	0	32	20	25	0	0	**714**	720.5

per hour

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU.h
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		01:00	01:00	01:00	01:00	01:00	01:00	01:00			01:00	01:00
07:30	**08:30**	**147**	**44**	**14**	**1**	**12**	**3**	**10**			**231**	241.5
07:45	08:45	176	37	12	1	11	4	11			**252**	259.1
08:00	09:00	197	34	11	0	9	5	11			**267**	269.7
08:15	09:15	199	34	12	0	8	4	11			**268**	270.8
08:30	**09:30**	**195**	**36**	**13**	**0**	**8**	**2**	**9**			**263**	**269.1**
08:45	09:45	135	28	10	0	6	1	6			**186**	191.6
09:00	10:00	73	18	8	0	5	0	5			**109**	114
09:15	10:15	40	11	3	0	3	0	2			**59**	61.9
15:00	16:00	191	31	6	0	13	7	9			**257**	261.6
15:15	16:15	183	27	6	0	12	5	8			**241**	246.6
15:30	**16:30**	**180**	**28**	**4**	**0**	**12**	**7**	**8**			**239**	**242.4**
15:45	16:45	170	28	4	0	13	5	4			**224**	232.8
16:00	17:00	170	27	4	0	10	5	3			**219**	225.6
16:15	17:15	170	27	5	0	12	6	3			**223**	231.5
16:30	**17:30**	**179**	**26**	**5**	**0**	**10**	**6**	**6**			**232**	236.1
16:45	17:45	181	22	3	0	7	6	10			**229**	225.9
17:00	18:00	185	20	3	0	9	8	13			**238**	**233.3**
17:15	18:15	137	15	1	0	5	6	12			**176**	168.3
17:30	**18:30**	**92**	**9**	**0**	**0**	**3**	**3**	**8**			**115**	109.8
17:45	18:45	46	5	0	0	2	2	4			**59**	56.6
	P/TOT	**888**	**158**	**40**	**1**	**52**	**25**	**44**	**0**	**0**	**1208**	**1231**

SITE: **1**
LOCATION: Manor Road / Retail Park Access
TOTAL ARMS: A B C

from arm: **all**
to arm: **A**

period I period II
from: 07:30 15:00
to: 09:30 18:00

DATE: 02/10/2018
DAY: Tuesday

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		00:15	00:15	00:15	00:15	00:15	00:15	00:15			00:15	00:15
07:30	**07:45**	79	13	4	0	7	4	2			**109**	114
07:45	08:00	48	8	1	0	8	1	2			**68**	74.3
08:00	08:15	63	11	1	1	3	5	5			**89**	86.8
08:15	08:30	63	13	2	1	4	1	4			**88**	90.5
08:30	**08:45**	64	11	1	0	3	4	3			**86**	84.7
08:45	09:00	80	13	1	1	1	1	3			**100**	99.8
09:00	09:15	65	6	2	0	2	1	1			**77**	78.6
09:15	09:30	74	12	1	1	4	1	0			**93**	98.2
15:00	15:15	64	8	3	0	3	1	4			**83**	83.7
15:15	15:30	47	13	5	1	6	1	1			**74**	82.4
15:30	**15:45**	87	11	1	2	4	3	2			**110**	113.7
15:45	16:00	53	12	3	0	5	1	0			**74**	79.9
16:00	16:15	70	12	3	1	4	1	1			**92**	97.4
16:15	16:30	70	13	1	1	4	0	2			**91**	95.2
16:30	**16:45**	69	10	3	0	5	1	4			**92**	94.7
16:45	17:00	61	14	1	0	3	1	1			**81**	83.1
17:00	17:15	62	19	0	0	6	1	3			**91**	94
17:15	17:30	88	16	1	0	3	1	4			**113**	112.7
17:30	**17:45**	81	9	5	0	3	4	2			**104**	105.5
17:45	18:00	81	12	0	0	2	2	1			**98**	98
	P/TOT	**1369**	**236**	**39**	**9**	**80**	**35**	**45**	**0**	**0**	**1813**	**1867**
Period I Total:		536	87	13	4	32	18	20	0	0	**710**	726.9
Period II Total:		833	149	26	5	48	17	25	0	0	**1103**	1140

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU.h
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		01:00	01:00	01:00	01:00	01:00	01:00	01:00			01:00	01:00
07:30	**08:30**	**253**	**45**	**8**	**2**	**22**	**11**	**13**			**354**	365.6
07:45	08:45	238	43	5	2	18	11	14			**331**	336.3
08:00	09:00	270	48	5	3	11	11	15			**363**	361.8
08:15	09:15	272	43	6	2	10	7	11			**351**	353.6
08:30	**09:30**	**283**	**42**	**5**	**2**	**10**	**7**	**7**			**356**	**361.3**
08:45	09:45	219	31	4	2	7	3	4			**270**	276.6
09:00	10:00	139	18	3	1	6	2	1			**170**	176.8
09:15	10:15	74	12	1	1	4	1	0			**93**	98.2
15:00	16:00	251	44	12	3	18	6	7			**341**	359.7
15:15	16:15	257	48	12	4	19	6	4			**350**	373.4
15:30	**16:30**	**280**	**48**	**8**	**4**	**17**	**5**	**5**			**367**	**386.2**
15:45	16:45	262	47	10	2	18	3	7			**349**	367.2
16:00	17:00	270	49	8	2	16	3	8			**356**	370.4
16:15	17:15	262	56	5	1	18	3	10			**355**	367
16:30	**17:30**	**280**	**59**	**5**	**0**	**17**	**4**	**12**			**377**	384.5
16:45	17:45	292	58	7	0	15	7	10			**389**	395.3
17:00	18:00	312	56	6	0	14	8	10			**406**	**410.2**
17:15	18:15	250	37	6	0	8	7	7			**315**	316.2
17:30	**18:30**	**162**	**21**	**5**	**0**	**5**	**6**	**3**			**202**	203.5
17:45	18:45	81	12	0	0	2	2	1			**98**	98
	P/TOT	**1369**	**236**	**39**	**9**	**80**	**35**	**45**	**0**	**0**	**1813**	**1867**

SITE: **1**
LOCATION: Manor Road / Retail Park Access
TOTAL ARMS:

from arm: **B**
to arm: **A**

period I period II
from: 07:30 15:00
to: 09:30 18:00

DATE: 02/10/2018
DAY: Tuesday

per quarter of an hour

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		00:15	00:15	00:15	00:15	00:15	00:15	00:15			00:15	00:15
07:30	**07:45**	2	0	1	0	2	0	0			**5**	7.5
07:45	08:00	1	0	0	0	3	0	0			**4**	7
08:00	08:15	2	1	0	0	2	0	0			**5**	7
08:15	08:30	5	3	0	0	2	0	0			**10**	12
08:30	**08:45**	3	0	0	0	3	0	0			**6**	9
08:45	09:00	2	0	0	0	1	0	0			**3**	4
09:00	09:15	4	2	0	0	2	0	0			**8**	10
09:15	09:30	11	2	0	1	2	0	0			**16**	19.3
15:00	15:15	9	0	0	0	2	0	0			**11**	13
15:15	15:30	8	2	0	0	3	0	0			**13**	16
15:30	**15:45**	15	0	0	0	3	2	1			**21**	22
15:45	16:00	7	1	0	0	2	0	0			**10**	12
16:00	16:15	17	1	1	0	3	0	0			**22**	25.5
16:15	16:30	13	1	0	0	2	0	0			**16**	18
16:30	**16:45**	16	0	0	0	4	0	1			**21**	24.2
16:45	17:00	7	1	0	0	1	0	0			**9**	10
17:00	17:15	6	1	0	0	3	0	1			**11**	13.2
17:15	17:30	8	1	0	0	2	0	0			**11**	13
17:30	**17:45**	6	1	0	0	2	0	0			**9**	11
17:45	18:00	8	0	0	0	0	0	0			**8**	8
	P/TOT	**150**	**17**	**2**	**1**	**44**	**2**	**3**	**0**	**0**	**219**	**261.7**
Period I Total:		30	8	1	1	17	0	0	0	0	**57**	75.8
Period II Total:		120	9	1	0	27	2	3	0	0	**162**	185.9

per hour

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU.h
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		01:00	01:00	01:00	01:00	01:00	01:00	01:00			01:00	01:00
07:30	**08:30**	**10**	**4**	**1**	**0**	**9**	**0**	**0**			**24**	33.5
07:45	08:45	11	4	0	0	10	0	0			**25**	35
08:00	09:00	12	4	0	0	8	0	0			**24**	32
08:15	09:15	14	5	0	0	8	0	0			**27**	35
08:30	**09:30**	**20**	**4**	**0**	**1**	**8**	**0**	**0**			**33**	**42.3**
08:45	09:45	17	4	0	1	5	0	0			**27**	33.3
09:00	10:00	15	4	0	1	4	0	0			**24**	29.3
09:15	10:15	11	2	0	1	2	0	0			**16**	19.3
15:00	16:00	39	3	0	0	10	2	1			**55**	63
15:15	16:15	47	4	1	0	11	2	1			**66**	75.5
15:30	**16:30**	**52**	**3**	**1**	**0**	**10**	**2**	**1**			**69**	**77.5**
15:45	16:45	53	3	1	0	11	0	1			**69**	79.7
16:00	17:00	53	3	1	0	10	0	1			**68**	77.7
16:15	17:15	42	3	0	0	10	0	2			**57**	65.4
16:30	**17:30**	**37**	**3**	**0**	**0**	**10**	**0**	**2**			**52**	60.4
16:45	17:45	27	4	0	0	8	0	1			**40**	47.2
17:00	18:00	28	3	0	0	7	0	1			**39**	**45.2**
17:15	18:15	22	2	0	0	4	0	0			**28**	32
17:30	**18:30**	**14**	**1**	**0**	**0**	**2**	**0**	**0**			**17**	19
17:45	18:45	8	0	0	0	0	0	0			**8**	8
	P/TOT	**150**	**17**	**2**	**1**	**44**	**2**	**3**	**0**	**0**	**219**	**261.7**

SITE: **1**
LOCATION: Manor Road / Retail Park Access
TOTAL ARMS: A B C

from arm: **B**
to arm: **B**

period I period II
from: 07:30 15:00
to: 09:30 18:00

DATE: 02/10/2018
DAY: Tuesday

per quarter of an hour

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		00:15	00:15	00:15	00:15	00:15	00:15	00:15			00:15	00:15
07:30	**07:45**	0	0	0	0	0	0	0			**0**	0
07:45	08:00	0	0	0	0	0	0	0			**0**	0
08:00	08:15	0	0	0	0	0	0	0			**0**	0
08:15	08:30	0	0	0	0	0	0	0			**0**	0
08:30	**08:45**	0	0	0	0	0	0	0			**0**	0
08:45	09:00	0	0	0	0	0	0	0			**0**	0
09:00	09:15	0	0	0	0	0	0	0			**0**	0
09:15	09:30	0	0	0	0	0	0	0			**0**	0
15:00	15:15	0	0	0	0	0	0	0			**0**	0
15:15	15:30	0	0	0	0	0	0	0			**0**	0
15:30	**15:45**	0	0	0	0	0	0	0			**0**	0
15:45	16:00	0	0	0	0	0	0	0			**0**	0
16:00	16:15	0	0	0	0	0	0	0			**0**	0
16:15	16:30	0	0	0	0	0	0	0			**0**	0
16:30	**16:45**	0	0	0	0	0	0	0			**0**	0
16:45	17:00	0	0	0	0	0	0	0			**0**	0
17:00	17:15	0	0	0	0	0	0	0			**0**	0
17:15	17:30	0	0	0	0	0	0	0			**0**	0
17:30	**17:45**	0	0	0	0	0	0	0			**0**	0
17:45	18:00	0	0	0	0	0	0	0			**0**	0
	P/TOT	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0	0	**0**	**0**
Period I Total:		0	0	0	0	0	0	0	0	0	**0**	0
Period II Total:		0	0	0	0	0	0	0	0	0	**0**	0

per hour

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU.h
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		01:00	01:00	01:00	01:00	01:00	01:00	01:00			01:00	01:00
07:30	**08:30**	**0**	**0**	**0**	**0**	**0**	**0**	**0**			**0**	0
07:45	08:45	0	0	0	0	0	0	0			**0**	0
08:00	09:00	0	0	0	0	0	0	0			**0**	0
08:15	09:15	0	0	0	0	0	0	0			**0**	0
08:30	**09:30**	**0**	**0**	**0**	**0**	**0**	**0**	**0**			**0**	**0**
08:45	09:45	0	0	0	0	0	0	0			**0**	0
09:00	10:00	0	0	0	0	0	0	0			**0**	0
09:15	10:15	0	0	0	0	0	0	0			**0**	0
15:00	16:00	0	0	0	0	0	0	0			**0**	0
15:15	16:15	0	0	0	0	0	0	0			**0**	0
15:30	**16:30**	**0**	**0**	**0**	**0**	**0**	**0**	**0**			**0**	**0**
15:45	16:45	0	0	0	0	0	0	0			**0**	0
16:00	17:00	0	0	0	0	0	0	0			**0**	0
16:15	17:15	0	0	0	0	0	0	0			**0**	0
16:30	**17:30**	**0**	**0**	**0**	**0**	**0**	**0**	**0**			**0**	0
16:45	17:45	0	0	0	0	0	0	0			**0**	0
17:00	18:00	0	0	0	0	0	0	0			**0**	**0**
17:15	18:15	0	0	0	0	0	0	0			**0**	0
17:30	**18:30**	**0**	**0**	**0**	**0**	**0**	**0**	**0**			**0**	0
17:45	18:45	0	0	0	0	0	0	0			**0**	0
	P/TOT	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0	0	**0**	**0**

SITE: **1**
LOCATION: Manor Road / Retail Park Access
TOTAL ARMS: A B C

from arm: **B**
to arm: **C**

period I period II
from: 07:30 15:00
to: 09:30 18:00

DATE: 02/10/2018
DAY: Tuesday

per quarter of an hour

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		00:15	00:15	00:15	00:15	00:15	00:15	00:15			00:15	00:15
07:30	**07:45**	0	0	0	0	0	0	0			**0**	0
07:45	08:00	1	0	0	0	0	0	0			**1**	1
08:00	08:15	0	0	0	0	0	0	0			**0**	0
08:15	08:30	2	0	0	0	0	0	0			**2**	2
08:30	**08:45**	0	0	0	0	0	0	0			**0**	0
08:45	09:00	1	0	0	0	0	0	1			**2**	1.2
09:00	09:15	3	0	0	0	0	0	0			**3**	3
09:15	09:30	4	0	0	0	1	0	0			**5**	6
15:00	15:15	6	1	0	0	0	0	0			**7**	7
15:15	15:30	9	1	0	0	0	0	0			**10**	10
15:30	**15:45**	7	1	0	0	0	0	0			**8**	8
15:45	16:00	8	0	0	0	0	0	0			**8**	8
16:00	16:15	6	0	0	0	0	0	0			**6**	6
16:15	16:30	6	1	0	0	0	0	0			**7**	7
16:30	**16:45**	7	2	0	0	0	0	0			**9**	9
16:45	17:00	6	1	0	0	0	0	0			**7**	7
17:00	17:15	7	1	0	0	0	0	0			**8**	8
17:15	17:30	6	0	1	0	0	0	0			**7**	7.5
17:30	**17:45**	4	0	0	0	0	0	0			**4**	4
17:45	18:00	5	0	0	0	0	0	0			**5**	5
	P/TOT	**88**	**8**	**1**	**0**	**1**	**0**	**1**	**0**	**0**	**99**	**99.7**
Period I Total:		11	0	0	0	1	0	1	0	0	**13**	13.2
Period II Total:		77	8	1	0	0	0	0	0	0	**86**	86.5

per hour

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU.h
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		01:00	01:00	01:00	01:00	01:00	01:00	01:00			01:00	01:00
07:30	**08:30**	**3**	**0**	**0**	**0**	**0**	**0**	**0**			**3**	3
07:45	08:45	3	0	0	0	0	0	0			**3**	3
08:00	09:00	3	0	0	0	0	0	1			**4**	3.2
08:15	09:15	6	0	0	0	0	0	1			**7**	6.2
08:30	**09:30**	**8**	**0**	**0**	**0**	**1**	**0**	**1**			**10**	**10.2**
08:45	09:45	8	0	0	0	1	0	1			**10**	10.2
09:00	10:00	7	0	0	0	1	0	0			**8**	9
09:15	10:15	4	0	0	0	1	0	0			**5**	6
15:00	16:00	30	3	0	0	0	0	0			**33**	33
15:15	16:15	30	2	0	0	0	0	0			**32**	32
15:30	**16:30**	**27**	**2**	**0**	**0**	**0**	**0**	**0**			**29**	**29**
15:45	16:45	27	3	0	0	0	0	0			**30**	30
16:00	17:00	25	4	0	0	0	0	0			**29**	29
16:15	17:15	26	5	0	0	0	0	0			**31**	31
16:30	**17:30**	**26**	**4**	**1**	**0**	**0**	**0**	**0**			**31**	31.5
16:45	17:45	23	2	1	0	0	0	0			**26**	26.5
17:00	18:00	22	1	1	0	0	0	0			**24**	**24.5**
17:15	18:15	15	0	1	0	0	0	0			**16**	16.5
17:30	**18:30**	**9**	**0**	**0**	**0**	**0**	**0**	**0**			**9**	9
17:45	18:45	5	0	0	0	0	0	0			**5**	5
	P/TOT	**88**	**8**	**1**	**0**	**1**	**0**	**1**	**0**	**0**	**99**	**99.7**

SITE: **1**
LOCATION: Manor Road / Retail Park Access
TOTAL ARMS: A B C

from arm: **B**
to arm: **all**

period I period II
from: 07:30 15:00
to: 09:30 18:00

DATE: 02/10/2018
DAY: Tuesday

per quarter of an hour

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		00:15	00:15	00:15	00:15	00:15	00:15	00:15			00:15	00:15
07:30	**07:45**	2	0	1	0	2	0	0			**5**	7.5
07:45	08:00	2	0	0	0	3	0	0			**5**	8
08:00	08:15	2	1	0	0	2	0	0			**5**	7
08:15	08:30	7	3	0	0	2	0	0			**12**	14
08:30	**08:45**	3	0	0	0	3	0	0			**6**	9
08:45	09:00	3	0	0	0	1	0	1			**5**	5.2
09:00	09:15	7	2	0	0	2	0	0			**11**	13
09:15	09:30	15	2	0	1	3	0	0			**21**	25.3
15:00	15:15	15	1	0	0	2	0	0			**18**	20
15:15	15:30	17	3	0	0	3	0	0			**23**	26
15:30	**15:45**	22	1	0	0	3	2	1			**29**	30
15:45	16:00	15	1	0	0	2	0	0			**18**	20
16:00	16:15	23	1	1	0	3	0	0			**28**	31.5
16:15	16:30	19	2	0	0	2	0	0			**23**	25
16:30	**16:45**	23	2	0	0	4	0	1			**30**	33.2
16:45	17:00	13	2	0	0	1	0	0			**16**	17
17:00	17:15	13	2	0	0	3	0	1			**19**	21.2
17:15	17:30	14	1	1	0	2	0	0			**18**	20.5
17:30	**17:45**	10	1	0	0	2	0	0			**13**	15
17:45	18:00	13	0	0	0	0	0	0			**13**	13
	P/TOT	**238**	**25**	**3**	**1**	**45**	**2**	**4**	**0**	**0**	**318**	**361.4**
Period I Total:		41	8	1	1	18	0	1	0	0	**70**	89
Period II Total:		197	17	2	0	27	2	3	0	0	**248**	272.4

per hour

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU.h
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		01:00	01:00	01:00	01:00	01:00	01:00	01:00			01:00	01:00
07:30	**08:30**	**13**	**4**	**1**	**0**	**9**	**0**	**0**			**27**	36.5
07:45	08:45	14	4	0	0	10	0	0			**28**	38
08:00	09:00	15	4	0	0	8	0	1			**28**	35.2
08:15	09:15	20	5	0	0	8	0	1			**34**	41.2
08:30	**09:30**	**28**	**4**	**0**	**1**	**9**	**0**	**1**			**43**	**52.5**
08:45	09:45	25	4	0	1	6	0	1			**37**	43.5
09:00	10:00	22	4	0	1	5	0	0			**32**	38.3
09:15	10:15	15	2	0	1	3	0	0			**21**	25.3
15:00	16:00	69	6	0	0	10	2	1			**88**	96
15:15	16:15	77	6	1	0	11	2	1			**98**	107.5
15:30	**16:30**	**79**	**5**	**1**	**0**	**10**	**2**	**1**			**98**	**106.5**
15:45	16:45	80	6	1	0	11	0	1			**99**	109.7
16:00	17:00	78	7	1	0	10	0	1			**97**	106.7
16:15	17:15	68	8	0	0	10	0	2			**88**	96.4
16:30	**17:30**	**63**	**7**	**1**	**0**	**10**	**0**	**2**			**83**	91.9
16:45	17:45	50	6	1	0	8	0	1			**66**	73.7
17:00	18:00	50	4	1	0	7	0	1			**63**	**69.7**
17:15	18:15	37	2	1	0	4	0	0			**44**	48.5
17:30	**18:30**	**23**	**1**	**0**	**0**	**2**	**0**	**0**			**26**	28
17:45	18:45	13	0	0	0	0	0	0			**13**	13
	P/TOT	**238**	**25**	**3**	**1**	**45**	**2**	**4**	**0**	**0**	**318**	**361.4**

SITE: **1**
LOCATION: Manor Road / Retail Park Access
TOTAL ARMS: A B C

from arm: **all**
to arm: **B**

period I period II
from: 07:30 15:00
to: 09:30 18:00

DATE: 02/10/2018
DAY: Tuesday

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		00:15	00:15	00:15	00:15	00:15	00:15	00:15			00:15	00:15
07:30	**07:45**	1	0	1	0	1	0	0			**3**	4.5
07:45	08:00	4	1	0	0	3	0	0			**8**	11
08:00	08:15	2	1	0	0	2	0	0			**5**	7
08:15	08:30	9	1	0	0	3	0	0			**13**	16
08:30	**08:45**	5	0	0	0	2	0	0			**7**	9
08:45	09:00	8	2	0	0	0	0	1			**11**	10.2
09:00	09:15	13	0	0	0	2	0	0			**15**	17
09:15	09:30	11	5	0	0	3	0	1			**20**	22.2
15:00	15:15	19	0	0	0	2	0	0			**21**	23
15:15	15:30	18	1	0	0	3	1	0			**23**	25.4
15:30	**15:45**	17	2	0	0	3	1	1			**24**	25.6
15:45	16:00	16	0	0	0	3	0	1			**20**	22.2
16:00	16:15	29	1	0	0	1	0	0			**31**	32
16:15	16:30	11	3	0	0	4	0	0			**18**	22
16:30	**16:45**	15	2	1	0	3	0	1			**22**	24.7
16:45	17:00	13	2	0	0	0	0	0			**15**	15
17:00	17:15	11	0	0	0	3	0	0			**14**	17
17:15	17:30	15	1	0	0	2	0	0			**18**	20
17:30	**17:45**	12	0	0	0	1	0	0			**13**	14
17:45	18:00	12	0	0	0	2	0	1			**15**	16.2
	P/TOT	**241**	**22**	**2**	**0**	**43**	**2**	**6**	**0**	**0**	**316**	**354**
Period I Total:		53	10	1	0	16	0	2	0	0	**82**	96.9
Period II Total:		188	12	1	0	27	2	4	0	0	**234**	257.1

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU.h
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		01:00	01:00	01:00	01:00	01:00	01:00	01:00			01:00	01:00
07:30	**08:30**	**16**	**3**	**1**	**0**	**9**	**0**	**0**			**29**	38.5
07:45	08:45	20	3	0	0	10	0	0			**33**	43
08:00	09:00	24	4	0	0	7	0	1			**36**	42.2
08:15	09:15	35	3	0	0	7	0	1			**46**	52.2
08:30	**09:30**	**37**	**7**	**0**	**0**	**7**	**0**	**2**			**53**	**58.4**
08:45	09:45	32	7	0	0	5	0	2			**46**	49.4
09:00	10:00	24	5	0	0	5	0	1			**35**	39.2
09:15	10:15	11	5	0	0	3	0	1			**20**	22.2
15:00	16:00	70	3	0	0	11	2	2			**88**	96.2
15:15	16:15	80	4	0	0	10	2	2			**98**	105.2
15:30	**16:30**	**73**	**6**	**0**	**0**	**11**	**1**	**2**			**93**	**101.8**
15:45	16:45	71	6	1	0	11	0	2			**91**	100.9
16:00	17:00	68	8	1	0	8	0	1			**86**	93.7
16:15	17:15	50	7	1	0	10	0	1			**69**	78.7
16:30	**17:30**	**54**	**5**	**1**	**0**	**8**	**0**	**1**			**69**	76.7
16:45	17:45	51	3	0	0	6	0	0			**60**	66
17:00	18:00	50	1	0	0	8	0	1			**60**	**67.2**
17:15	18:15	39	1	0	0	5	0	1			**46**	50.2
17:30	**18:30**	**24**	**0**	**0**	**0**	**3**	**0**	**1**			**28**	30.2
17:45	18:45	12	0	0	0	2	0	1			**15**	16.2
	P/TOT	**241**	**22**	**2**	**0**	**43**	**2**	**6**	**0**	**0**	**316**	**354**

SITE: **1**
LOCATION: Manor Road / Retail Park Access
TOTAL ARMS:

from arm: **C**
to arm: **A**

period I period II
from: 07:30 15:00
to: 09:30 18:00

DATE: 02/10/2018
DAY: Tuesday

per quarter of an hour

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		00:15	00:15	00:15	00:15	00:15	00:15	00:15			00:15	00:15
07:30	**07:45**	77	13	3	0	5	4	2			**104**	106.5
07:45	08:00	47	8	1	0	5	1	2			**64**	67.3
08:00	08:15	61	10	1	1	1	5	5			**84**	79.8
08:15	08:30	58	10	2	1	2	1	4			**78**	78.5
08:30	**08:45**	61	11	1	0	0	4	3			**80**	75.7
08:45	09:00	78	13	1	1	0	1	3			**97**	95.8
09:00	09:15	61	4	2	0	0	1	1			**69**	68.6
09:15	09:30	63	10	1	0	2	1	0			**77**	78.9
15:00	15:15	55	8	3	0	1	1	4			**72**	70.7
15:15	15:30	39	11	5	1	3	1	1			**61**	66.4
15:30	**15:45**	72	11	1	2	1	1	1			**89**	91.7
15:45	16:00	46	11	3	0	3	1	0			**64**	67.9
16:00	16:15	53	11	2	1	1	1	1			**70**	71.9
16:15	16:30	57	12	1	1	2	0	2			**75**	77.2
16:30	**16:45**	53	10	3	0	1	1	3			**71**	70.5
16:45	17:00	54	13	1	0	2	1	1			**72**	73.1
17:00	17:15	56	18	0	0	3	1	2			**80**	80.8
17:15	17:30	80	15	1	0	1	1	4			**102**	99.7
17:30	**17:45**	75	8	5	0	1	4	2			**95**	94.5
17:45	18:00	73	12	0	0	2	2	1			**90**	90
	P/TOT	**1219**	**219**	**37**	**8**	**36**	**33**	**42**	**0**	**0**	**1594**	**1606**
Period I Total:		506	79	12	3	15	18	20	0	0	**653**	651.1
Period II Total:		713	140	25	5	21	15	22	0	0	**941**	954.4

per hour

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU.h
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		01:00	01:00	01:00	01:00	01:00	01:00	01:00			01:00	01:00
07:30	**08:30**	**243**	**41**	**7**	**2**	**13**	**11**	**13**			**330**	332.1
07:45	08:45	227	39	5	2	8	11	14			**306**	301.3
08:00	09:00	258	44	5	3	3	11	15			**339**	329.8
08:15	09:15	258	38	6	2	2	7	11			**324**	318.6
08:30	**09:30**	**263**	**38**	**5**	**1**	**2**	**7**	**7**			**323**	**319**
08:45	09:45	202	27	4	1	2	3	4			**243**	243.3
09:00	10:00	124	14	3	0	2	2	1			**146**	147.5
09:15	10:15	63	10	1	0	2	1	0			**77**	78.9
15:00	16:00	212	41	12	3	8	4	6			**286**	296.7
15:15	16:15	210	44	11	4	8	4	3			**284**	297.9
15:30	**16:30**	**228**	**45**	**7**	**4**	**7**	**3**	**4**			**298**	**308.7**
15:45	16:45	209	44	9	2	7	3	6			**280**	287.5
16:00	17:00	217	46	7	2	6	3	7			**288**	292.7
16:15	17:15	220	53	5	1	8	3	8			**298**	301.6
16:30	**17:30**	**243**	**56**	**5**	**0**	**7**	**4**	**10**			**325**	324.1
16:45	17:45	265	54	7	0	7	7	9			**349**	348.1
17:00	18:00	284	53	6	0	7	8	9			**367**	**365**
17:15	18:15	228	35	6	0	4	7	7			**287**	284.2
17:30	**18:30**	**148**	**20**	**5**	**0**	**3**	**6**	**3**			**185**	184.5
17:45	18:45	73	12	0	0	2	2	1			**90**	90
	P/TOT	**1219**	**219**	**37**	**8**	**36**	**33**	**42**	**0**	**0**	**1594**	**1606**

SITE: **1**
LOCATION: Manor Road / Retail Park Access
TOTAL ARMS: A B C

from arm: **C**
to arm: **B**

period I period II
from: 07:30 15:00
to: 09:30 18:00

DATE: 02/10/2018
DAY: Tuesday

per quarter of an hour

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		00:15	00:15	00:15	00:15	00:15	00:15	00:15			00:15	00:15
07:30	**07:45**	0	0	0	0	0	0	0			**0**	0
07:45	08:00	1	0	0	0	0	0	0			**1**	1
08:00	08:15	0	0	0	0	0	0	0			**0**	0
08:15	08:30	1	0	0	0	0	0	0			**1**	1
08:30	**08:45**	1	0	0	0	0	0	0			**1**	1
08:45	09:00	4	1	0	0	0	0	0			**5**	5
09:00	09:15	7	0	0	0	0	0	0			**7**	7
09:15	09:30	5	0	0	0	1	0	0			**6**	7
15:00	15:15	9	0	0	0	0	0	0			**9**	9
15:15	15:30	6	1	0	0	0	0	0			**7**	7
15:30	**15:45**	2	1	0	0	0	0	0			**3**	3
15:45	16:00	7	0	0	0	0	0	0			**7**	7
16:00	16:15	13	1	0	0	0	0	0			**14**	14
16:15	16:30	9	1	0	0	0	0	0			**10**	10
16:30	**16:45**	6	0	0	0	0	0	1			**7**	6.2
16:45	17:00	8	1	0	0	0	0	0			**9**	9
17:00	17:15	4	0	0	0	0	0	0			**4**	4
17:15	17:30	9	1	0	0	0	0	0			**10**	10
17:30	**17:45**	6	0	0	0	0	0	0			**6**	6
17:45	18:00	4	0	0	0	0	0	1			**5**	4.2
	P/TOT	**102**	**7**	**0**	**0**	**1**	**0**	**2**	**0**	**0**	**112**	**111.4**
Period I Total:		19	1	0	0	1	0	0	0	0	**21**	22
Period II Total:		83	6	0	0	0	0	2	0	0	**91**	89.4

per hour

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU.h
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		01:00	01:00	01:00	01:00	01:00	01:00	01:00			01:00	01:00
07:30	**08:30**	**2**	**0**	**0**	**0**	**0**	**0**	**0**			**2**	2
07:45	08:45	3	0	0	0	0	0	0			**3**	3
08:00	09:00	6	1	0	0	0	0	0			**7**	7
08:15	09:15	13	1	0	0	0	0	0			**14**	14
08:30	**09:30**	**17**	**1**	**0**	**0**	**1**	**0**	**0**			**19**	**20**
08:45	09:45	16	1	0	0	1	0	0			**18**	19
09:00	10:00	12	0	0	0	1	0	0			**13**	14
09:15	10:15	5	0	0	0	1	0	0			**6**	7
15:00	16:00	24	2	0	0	0	0	0			**26**	26
15:15	16:15	28	3	0	0	0	0	0			**31**	31
15:30	**16:30**	**31**	**3**	**0**	**0**	**0**	**0**	**0**			**34**	**34**
15:45	16:45	35	2	0	0	0	0	1			**38**	37.2
16:00	17:00	36	3	0	0	0	0	1			**40**	39.2
16:15	17:15	27	2	0	0	0	0	1			**30**	29.2
16:30	**17:30**	**27**	**2**	**0**	**0**	**0**	**0**	**1**			**30**	29.2
16:45	17:45	27	2	0	0	0	0	0			**29**	29
17:00	18:00	23	1	0	0	0	0	1			**25**	**24.2**
17:15	18:15	19	1	0	0	0	0	1			**21**	20.2
17:30	**18:30**	**10**	**0**	**0**	**0**	**0**	**0**	**1**			**11**	10.2
17:45	18:45	4	0	0	0	0	0	1			**5**	4.2
	P/TOT	**102**	**7**	**0**	**0**	**1**	**0**	**2**	**0**	**0**	**112**	**111.4**

SITE: **1**
LOCATION: Manor Road / Retail Park Access
TOTAL ARMS: A B C

from arm: **C**
to arm: **C**

period I period II
from: 07:30 15:00
to: 09:30 18:00

DATE: 02/10/2018
DAY: Tuesday

per quarter of an hour

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		00:15	00:15	00:15	00:15	00:15	00:15	00:15			00:15	00:15
07:30	**07:45**	0	0	0	0	0	0	0			**0**	0
07:45	08:00	0	0	0	0	0	0	0			**0**	0
08:00	08:15	0	0	0	0	0	0	0			**0**	0
08:15	08:30	0	0	0	0	0	0	0			**0**	0
08:30	**08:45**	0	0	0	0	0	0	0			**0**	0
08:45	09:00	0	0	0	0	0	0	0			**0**	0
09:00	09:15	0	0	0	0	0	0	0			**0**	0
09:15	09:30	0	0	0	0	0	0	0			**0**	0
15:00	15:15	0	0	0	0	0	0	0			**0**	0
15:15	15:30	0	0	0	0	0	0	0			**0**	0
15:30	**15:45**	0	0	0	0	0	0	0			**0**	0
15:45	16:00	0	0	0	0	0	0	0			**0**	0
16:00	16:15	0	0	0	0	0	0	0			**0**	0
16:15	16:30	0	0	0	0	0	0	0			**0**	0
16:30	**16:45**	0	0	0	0	0	0	0			**0**	0
16:45	17:00	0	0	0	0	0	0	0			**0**	0
17:00	17:15	0	0	0	0	0	0	0			**0**	0
17:15	17:30	0	0	0	0	0	0	0			**0**	0
17:30	**17:45**	0	0	0	0	0	0	0			**0**	0
17:45	18:00	0	0	0	0	0	0	0			**0**	0
	P/TOT	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Period I Total:		0	0	0	0	0	0	0	0	0	**0**	0
Period II Total:		0	0	0	0	0	0	0	0	0	**0**	0

per hour

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU.h
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		01:00	01:00	01:00	01:00	01:00	01:00	01:00			01:00	01:00
07:30	**08:30**	**0**	**0**	**0**	**0**	**0**	**0**	**0**			**0**	0
07:45	08:45	0	0	0	0	0	0	0			**0**	0
08:00	09:00	0	0	0	0	0	0	0			**0**	0
08:15	09:15	0	0	0	0	0	0	0			**0**	0
08:30	**09:30**	**0**	**0**	**0**	**0**	**0**	**0**	**0**			**0**	**0**
08:45	09:45	0	0	0	0	0	0	0			**0**	0
09:00	10:00	0	0	0	0	0	0	0			**0**	0
09:15	10:15	0	0	0	0	0	0	0			**0**	0
15:00	16:00	0	0	0	0	0	0	0			**0**	0
15:15	16:15	0	0	0	0	0	0	0			**0**	0
15:30	**16:30**	**0**	**0**	**0**	**0**	**0**	**0**	**0**			**0**	**0**
15:45	16:45	0	0	0	0	0	0	0			**0**	0
16:00	17:00	0	0	0	0	0	0	0			**0**	0
16:15	17:15	0	0	0	0	0	0	0			**0**	0
16:30	**17:30**	**0**	**0**	**0**	**0**	**0**	**0**	**0**			**0**	0
16:45	17:45	0	0	0	0	0	0	0			**0**	0
17:00	18:00	0	0	0	0	0	0	0			**0**	**0**
17:15	18:15	0	0	0	0	0	0	0			**0**	0
17:30	**18:30**	**0**	**0**	**0**	**0**	**0**	**0**	**0**			**0**	0
17:45	18:45	0	0	0	0	0	0	0			**0**	0
	P/TOT	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

SITE: **1**
LOCATION: Manor Road / Retail Park Access
TOTAL ARMS: A B C

from arm: **C**
to arm: **all**

period I period II
from: 07:30 15:00
to: 09:30 18:00

DATE: 02/10/2018
DAY: Tuesday

per quarter of an hour

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		00:15	00:15	00:15	00:15	00:15	00:15	00:15			00:15	00:15
07:30	**07:45**	77	13	3	0	5	4	2			**104**	106.5
07:45	08:00	48	8	1	0	5	1	2			**65**	68.3
08:00	08:15	61	10	1	1	1	5	5			**84**	79.8
08:15	08:30	59	10	2	1	2	1	4			**79**	79.5
08:30	**08:45**	62	11	1	0	0	4	3			**81**	76.7
08:45	09:00	82	14	1	1	0	1	3			**102**	100.8
09:00	09:15	68	4	2	0	0	1	1			**76**	75.6
09:15	09:30	68	10	1	0	3	1	0			**83**	85.9
15:00	15:15	64	8	3	0	1	1	4			**81**	79.7
15:15	15:30	45	12	5	1	3	1	1			**68**	73.4
15:30	**15:45**	74	12	1	2	1	1	1			**92**	94.7
15:45	16:00	53	11	3	0	3	1	0			**71**	74.9
16:00	16:15	66	12	2	1	1	1	1			**84**	85.9
16:15	16:30	66	13	1	1	2	0	2			**85**	87.2
16:30	**16:45**	59	10	3	0	1	1	4			**78**	76.7
16:45	17:00	62	14	1	0	2	1	1			**81**	82.1
17:00	17:15	60	18	0	0	3	1	2			**84**	84.8
17:15	17:30	89	16	1	0	1	1	4			**112**	109.7
17:30	**17:45**	81	8	5	0	1	4	2			**101**	100.5
17:45	18:00	77	12	0	0	2	2	2			**95**	94.2
	P/TOT	**1321**	**226**	**37**	**8**	**37**	**33**	**44**	**0**	**0**	**1706**	**1717**
Period I Total:		525	80	12	3	16	18	20	0	0	**674**	673.1
Period II Total:		796	146	25	5	21	15	24	0	0	**1032**	1044

per hour

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU.h
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		01:00	01:00	01:00	01:00	01:00	01:00	01:00			01:00	01:00
07:30	**08:30**	**245**	**41**	**7**	**2**	**13**	**11**	**13**			**332**	334.1
07:45	08:45	230	39	5	2	8	11	14			**309**	304.3
08:00	09:00	264	45	5	3	3	11	15			**346**	336.8
08:15	09:15	271	39	6	2	2	7	11			**338**	332.6
08:30	**09:30**	**280**	**39**	**5**	**1**	**3**	**7**	**7**			**342**	**339**
08:45	09:45	218	28	4	1	3	3	4			**261**	262.3
09:00	10:00	136	14	3	0	3	2	1			**159**	161.5
09:15	10:15	68	10	1	0	3	1	0			**83**	85.9
15:00	16:00	236	43	12	3	8	4	6			**312**	322.7
15:15	16:15	238	47	11	4	8	4	3			**315**	328.9
15:30	**16:30**	**259**	**48**	**7**	**4**	**7**	**3**	**4**			**332**	**342.7**
15:45	16:45	244	46	9	2	7	3	7			**318**	324.7
16:00	17:00	253	49	7	2	6	3	8			**328**	331.9
16:15	17:15	247	55	5	1	8	3	9			**328**	330.8
16:30	**17:30**	**270**	**58**	**5**	**0**	**7**	**4**	**11**			**355**	353.3
16:45	17:45	292	56	7	0	7	7	9			**378**	377.1
17:00	18:00	307	54	6	0	7	8	10			**392**	**389.2**
17:15	18:15	247	36	6	0	4	7	8			**308**	304.4
17:30	**18:30**	**158**	**20**	**5**	**0**	**3**	**6**	**4**			**196**	194.7
17:45	18:45	77	12	0	0	2	2	2			**95**	94.2
	P/TOT	**1321**	**226**	**37**	**8**	**37**	**33**	**44**	**0**	**0**	**1706**	**1717**

SITE: **1**
LOCATION: Manor Road / Retail Park Access
TOTAL ARMS: A B C

from arm: **all**
to arm: **C**

period I period II
from: 07:30 15:00
to: 09:30 18:00

DATE: 02/10/2018
DAY: Tuesday

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		00:15	00:15	00:15	00:15	00:15	00:15	00:15			00:15	00:15
07:30	**07:45**	30	15	4	0	2	0	2			**53**	55.4
07:45	08:00	39	12	3	1	0	0	1			**56**	58
08:00	08:15	29	6	4	0	1	1	3			**44**	44
08:15	08:30	38	8	2	0	0	2	4			**54**	50.6
08:30	**08:45**	56	8	3	0	0	1	3			**71**	69.5
08:45	09:00	59	9	2	0	1	1	1			**73**	73.6
09:00	09:15	30	7	5	0	0	0	3			**45**	45.1
09:15	09:30	38	6	3	0	2	0	1			**50**	52.7
15:00	15:15	52	10	1	0	1	3	2			**69**	67.1
15:15	15:30	36	7	3	0	1	0	1			**48**	49.7
15:30	**15:45**	46	8	2	0	0	2	3			**61**	58.4
15:45	16:00	41	8	0	0	0	0	1			**50**	49.2
16:00	16:15	38	5	1	0	1	1	1			**47**	47.1
16:15	16:30	40	6	1	0	0	3	1			**51**	48.9
16:30	**16:45**	42	8	1	0	1	1	0			**53**	53.9
16:45	17:00	43	7	0	0	0	0	1			**51**	50.2
17:00	17:15	48	6	2	0	1	2	1			**60**	60
17:15	17:30	45	6	2	0	0	3	4			**60**	56
17:30	**17:45**	44	4	0	0	0	1	4			**53**	49.2
17:45	18:00	43	5	0	0	0	2	4			**54**	49.6
	P/TOT	**837**	**151**	**39**	**1**	**11**	**23**	**41**	**0**	**0**	**1103**	**1088**
Period I Total:		319	71	26	1	6	5	18	0	0	**446**	448.9
Period II Total:		518	80	13	0	5	18	23	0	0	**657**	639.3

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU.h
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		01:00	01:00	01:00	01:00	01:00	01:00	01:00			01:00	01:00
07:30	**08:30**	**136**	**41**	**13**	**1**	**3**	**3**	**10**			**207**	208
07:45	08:45	162	34	12	1	1	4	11			**225**	222.1
08:00	09:00	182	31	11	0	2	5	11			**242**	237.7
08:15	09:15	183	32	12	0	1	4	11			**243**	238.8
08:30	**09:30**	**183**	**30**	**13**	**0**	**3**	**2**	**8**			**239**	**240.9**
08:45	09:45	127	22	10	0	3	1	5			**168**	171.4
09:00	10:00	68	13	8	0	2	0	4			**95**	97.8
09:15	10:15	38	6	3	0	2	0	1			**50**	52.7
15:00	16:00	175	33	6	0	2	5	7			**228**	224.4
15:15	16:15	161	28	6	0	2	3	6			**206**	204.4
15:30	**16:30**	**165**	**27**	**4**	**0**	**1**	**6**	**6**			**209**	**203.6**
15:45	16:45	161	27	3	0	2	5	3			**201**	199.1
16:00	17:00	163	26	3	0	2	5	3			**202**	200.1
16:15	17:15	173	27	4	0	2	6	3			**215**	213
16:30	**17:30**	**178**	**27**	**5**	**0**	**2**	**6**	**6**			**224**	220.1
16:45	17:45	180	23	4	0	1	6	10			**224**	215.4
17:00	18:00	180	21	4	0	1	8	13			**227**	**214.8**
17:15	18:15	132	15	2	0	0	6	12			**167**	154.8
17:30	**18:30**	**87**	**9**	**0**	**0**	**0**	**3**	**8**			**107**	98.8
17:45	18:45	43	5	0	0	0	2	4			**54**	49.6
	P/TOT	**837**	**151**	**39**	**1**	**11**	**23**	**41**	**0**	**0**	**1103**	**1088**

9256 / MANOR ROAD, RICHMOND
October 2018
Classified Turning Count

SITE: **1**
LOCATION: Manor Road / Retail Park Access
TOTAL ARMS: A B C

from arm: **all**
to arm: **all**

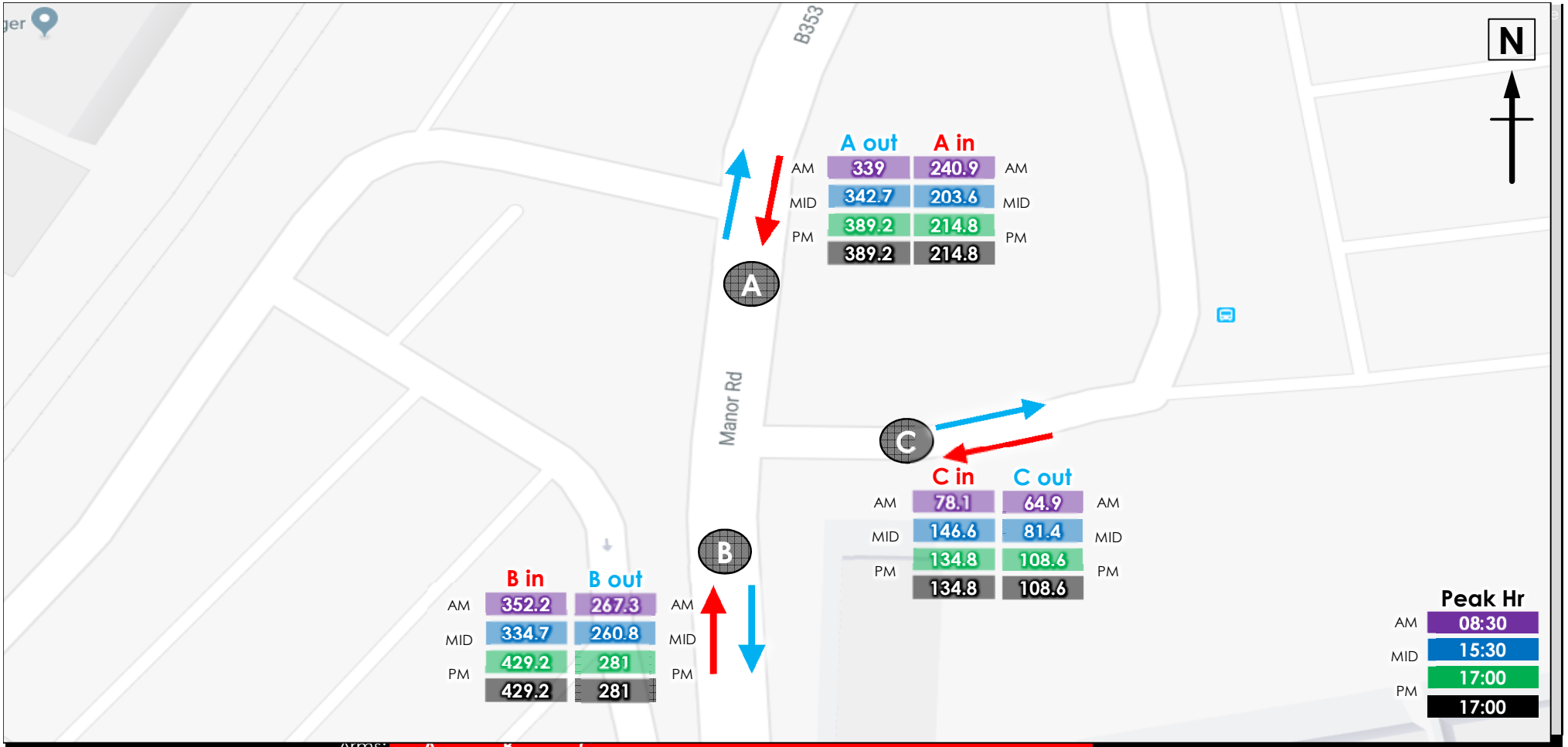
period I period II
from: 07:30 15:00
to: 09:30 18:00

DATE: 02/10/2018
DAY: Tuesday

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU	
PCU factor		1	1	1.5	2.3	2	0.4	0.2					
INTERVAL		00:15	00:15	00:15	00:15	00:15	00:15	00:15			00:15	00:15	
07:30	**07:45**	110	28	9	0	10	4	4			**165**	173.9	AM
07:45	08:00	91	21	4	1	11	1	3			**132**	143.3	AM
08:00	08:15	94	18	5	1	6	6	8			**138**	137.8	AM
08:15	08:30	110	22	4	1	7	3	8			**155**	157.1	AM
08:30	**08:45**	125	19	4	0	5	5	6			**164**	163.2	AM
08:45	09:00	147	24	3	1	2	2	5			**184**	183.6	AM
09:00	09:15	108	13	7	0	4	1	4			**137**	140.7	AM
09:15	09:30	123	23	4	1	9	1	2			**163**	173.1	AM
15:00	15:15	135	18	4	0	6	4	6			**173**	173.8	MID
15:15	15:30	101	21	8	1	10	2	2			**145**	157.5	MID
15:30	**15:45**	150	21	3	2	7	6	6			**195**	197.7	MID
15:45	16:00	110	20	3	0	8	1	2			**144**	151.3	MID
16:00	16:15	137	18	4	1	6	2	2			**170**	176.5	PM
16:15	16:30	121	22	2	1	8	3	3			**160**	166.1	PM
16:30	**16:45**	126	20	5	0	9	2	5			**167**	173.3	PM
16:45	17:00	117	23	1	0	3	1	2			**147**	148.3	PM
17:00	17:15	121	25	2	0	10	3	4			**165**	171	PM
17:15	17:30	148	23	3	0	5	4	8			**191**	188.7	PM
17:30	**17:45**	137	13	5	0	4	5	6			**170**	168.7	PM
17:45	18:00	136	17	0	0	4	4	6			**167**	163.8	PM
	P/TOT	**2447**	**409**	**80**	**10**	**134**	**60**	**92**	**0**	**0**	**3232**	**3309**	
Period I Total:		908	168	40	5	54	23	40	0	0	**1238**	1273	
Period II Total:		1539	241	40	5	80	37	52	0	0	**1994**	2037	

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU.h
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		01:00	01:00	01:00	01:00	01:00	01:00	01:00			01:00	01:00
07:30	**08:30**	**405**	**89**	**22**	**3**	**34**	**14**	**23**			**590**	612.1
07:45	08:45	420	80	17	3	29	15	25			**589**	601.4
08:00	09:00	476	83	16	3	20	16	27			**641**	641.7
08:15	09:15	490	78	18	2	18	11	23			**640**	644.6
08:30	**09:30**	**503**	**79**	**18**	**2**	**20**	**9**	**17**			**648**	**660.6**
08:45	09:45	378	60	14	2	15	4	11			**484**	497.4
09:00	10:00	231	36	11	1	13	2	6			**300**	313.8
09:15	10:15	123	23	4	1	9	1	2			**163**	173.1
15:00	16:00	496	80	18	3	31	13	16			**657**	680.3
15:15	16:15	498	80	18	4	31	11	12			**654**	683
15:30	**16:30**	**518**	**81**	**12**	**4**	**29**	**12**	**13**			**669**	**691.6**
15:45	16:45	494	80	14	2	31	8	12			**641**	667.2
16:00	17:00	501	83	12	2	26	8	12			**644**	664.2
16:15	17:15	485	90	10	1	30	9	14			**639**	658.7
16:30	**17:30**	**512**	**91**	**11**	**0**	**27**	**10**	**19**			**670**	681.3
16:45	17:45	523	84	11	0	22	13	20			**673**	676.7
17:00	18:00	542	78	10	0	23	16	24			**693**	**692.2**
17:15	18:15	421	53	8	0	13	13	20			**528**	521.2
17:30	**18:30**	**273**	**30**	**5**	**0**	**8**	**9**	**12**			**337**	332.5
17:45	18:45	136	17	0	0	4	4	6			**167**	163.8
	P/TOT	**2447**	**409**	**80**	**10**	**134**	**60**	**92**	**0**	**0**	**3232**	**3309**

				from:	to:		
08:30	**09:30**	AM Peak Hour	AM	07:00	10:00	AM Peak PCU	**660.6**
15:30	**16:30**	MID Peak Hour	MID	10:00	16:00	MID Peak PCU	**691.6**
17:00	**18:00**	PM Peak Hour	PM	16:00	19:00	PM Peak PCU	**692.2**
17:00	**18:00**	TOT Peak Hour				TOT Peak PCU	**692.2**



Arms:	A	B	C

NDC NATIONWIDE DATA COLLECTION	**Site / Location:**	2	Manor Road / Sainsbury's Access	**Project No:**	9256	**Drawing No:**	9256 - 02	**Drawn By:**	MB
	Survey Date:	02/10/2018		**Project Name:**	MANOR ROAD, RICHMOND				
	Survey Times:	from: 07:30 15:00 to: 09:30 18:00		**Drawing Title:**	Junction Labels and Peak Hr PCU's				

SITE: **2**
LOCATION: Manor Road / Sainsbury's Access
TOTAL ARMS: A B C

from arm: **A**
to arm: **A**

period I period II
from: 07:30 15:00
to: 09:30 18:00

DATE: 02/10/2018
DAY: Tuesday

per quarter of an hour

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		00:15	00:15	00:15	00:15	00:15	00:15	00:15			00:15	00:15
07:30	**07:45**	0	0	0	0	0	0	0			**0**	0
07:45	08:00	0	0	0	0	0	0	0			**0**	0
08:00	08:15	0	0	0	0	0	0	0			**0**	0
08:15	08:30	0	0	0	0	0	0	0			**0**	0
08:30	**08:45**	0	0	0	0	0	0	0			**0**	0
08:45	09:00	0	0	0	0	0	0	0			**0**	0
09:00	09:15	0	0	0	0	0	0	0			**0**	0
09:15	09:30	0	0	0	0	0	0	0			**0**	0
15:00	15:15	0	0	0	0	0	0	0			**0**	0
15:15	15:30	0	0	0	0	0	0	0			**0**	0
15:30	**15:45**	0	0	0	0	0	0	0			**0**	0
15:45	16:00	0	0	0	0	0	0	0			**0**	0
16:00	16:15	0	0	0	0	0	0	0			**0**	0
16:15	16:30	0	0	0	0	0	0	0			**0**	0
16:30	**16:45**	0	0	0	0	0	0	0			**0**	0
16:45	17:00	0	0	0	0	0	0	0			**0**	0
17:00	17:15	0	0	0	0	0	0	0			**0**	0
17:15	17:30	0	0	0	0	0	0	0			**0**	0
17:30	**17:45**	0	0	0	0	0	0	0			**0**	0
17:45	18:00	0	0	0	0	0	0	0			**0**	0
	P/TOT	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Period I Total:		0	0	0	0	0	0	0	0	0	**0**	0
Period II Total:		0	0	0	0	0	0	0	0	0	**0**	0

per hour

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU.h
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		01:00	01:00	01:00	01:00	01:00	01:00	01:00			01:00	01:00
07:30	**08:30**	**0**	**0**	**0**	**0**	**0**	**0**	**0**			**0**	0
07:45	08:45	0	0	0	0	0	0	0			**0**	0
08:00	09:00	0	0	0	0	0	0	0			**0**	0
08:15	09:15	0	0	0	0	0	0	0			**0**	0
08:30	**09:30**	**0**	**0**	**0**	**0**	**0**	**0**	**0**			**0**	**0**
08:45	09:45	0	0	0	0	0	0	0			**0**	0
09:00	10:00	0	0	0	0	0	0	0			**0**	0
09:15	10:15	0	0	0	0	0	0	0			**0**	0
15:00	16:00	0	0	0	0	0	0	0			**0**	0
15:15	16:15	0	0	0	0	0	0	0			**0**	0
15:30	**16:30**	**0**	**0**	**0**	**0**	**0**	**0**	**0**			**0**	**0**
15:45	16:45	0	0	0	0	0	0	0			**0**	0
16:00	17:00	0	0	0	0	0	0	0			**0**	0
16:15	17:15	0	0	0	0	0	0	0			**0**	0
16:30	**17:30**	**0**	**0**	**0**	**0**	**0**	**0**	**0**			**0**	0
16:45	17:45	0	0	0	0	0	0	0			**0**	0
17:00	18:00	0	0	0	0	0	0	0			**0**	**0**
17:15	18:15	0	0	0	0	0	0	0			**0**	0
17:30	**18:30**	**0**	**0**	**0**	**0**	**0**	**0**	**0**			**0**	0
17:45	18:45	0	0	0	0	0	0	0			**0**	0
	P/TOT	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

SITE: **2**
LOCATION: Manor Road / Sainsbury's Access
TOTAL ARMS: A B C

from arm: **A**
to arm: **B**

period I period II
from: 07:30 15:00
to: 09:30 18:00

DATE: 02/10/2018
DAY: Tuesday

per quarter of an hour

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		00:15	00:15	00:15	00:15	00:15	00:15	00:15			00:15	00:15
07:30	**07:45**	28	15	4	0	2	0	2			**51**	53.4
07:45	08:00	39	12	3	1	0	0	1			**56**	58
08:00	08:15	28	6	4	0	1	1	3			**43**	43
08:15	08:30	37	8	2	0	0	2	4			**53**	49.6
08:30	**08:45**	54	8	3	0	0	1	3			**69**	67.5
08:45	09:00	59	8	2	0	1	1	0			**71**	72.4
09:00	09:15	30	7	5	0	0	0	3			**45**	45.1
09:15	09:30	36	6	3	0	2	0	1			**48**	50.7
15:00	15:15	50	10	1	0	1	3	2			**67**	65.1
15:15	15:30	29	7	3	0	1	0	1			**41**	42.7
15:30	**15:45**	44	7	2	0	0	2	3			**58**	55.4
15:45	16:00	34	8	0	0	0	0	0			**42**	42
16:00	16:15	36	5	1	0	1	1	1			**45**	45.1
16:15	16:30	34	6	1	0	0	3	1			**45**	42.9
16:30	**16:45**	37	8	1	0	1	1	0			**48**	48.9
16:45	17:00	40	7	0	0	0	0	1			**48**	47.2
17:00	17:15	44	5	2	0	1	2	1			**55**	55
17:15	17:30	42	6	1	0	0	3	4			**56**	51.5
17:30	**17:45**	40	4	0	0	0	1	4			**49**	45.2
17:45	18:00	43	5	0	0	0	2	4			**54**	49.6
	P/TOT	**784**	**148**	**38**	**1**	**11**	**23**	**39**	**0**	**0**	**1044**	**1030**
Period I Total:		311	70	26	1	6	5	17	0	0	**436**	439.7
Period II Total:		473	78	12	0	5	18	22	0	0	**608**	590.6

per hour

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU.h
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		01:00	01:00	01:00	01:00	01:00	01:00	01:00			01:00	01:00
07:30	**08:30**	**132**	**41**	**13**	**1**	**3**	**3**	**10**			**203**	204
07:45	08:45	158	34	12	1	1	4	11			**221**	218.1
08:00	09:00	178	30	11	0	2	5	10			**236**	232.5
08:15	09:15	180	31	12	0	1	4	10			**238**	234.6
08:30	**09:30**	**179**	**29**	**13**	**0**	**3**	**2**	**7**			**233**	**235.7**
08:45	09:45	125	21	10	0	3	1	4			**164**	168.2
09:00	10:00	66	13	8	0	2	0	4			**93**	95.8
09:15	10:15	36	6	3	0	2	0	1			**48**	50.7
15:00	16:00	157	32	6	0	2	5	6			**208**	205.2
15:15	16:15	143	27	6	0	2	3	5			**186**	185.2
15:30	**16:30**	**148**	**26**	**4**	**0**	**1**	**6**	**5**			**190**	**185.4**
15:45	16:45	141	27	3	0	2	5	2			**180**	178.9
16:00	17:00	147	26	3	0	2	5	3			**186**	184.1
16:15	17:15	155	26	4	0	2	6	3			**196**	194
16:30	**17:30**	**163**	**26**	**4**	**0**	**2**	**6**	**6**			**207**	202.6
16:45	17:45	166	22	3	0	1	6	10			**208**	198.9
17:00	18:00	169	20	3	0	1	8	13			**214**	**201.3**
17:15	18:15	125	15	1	0	0	6	12			**159**	146.3
17:30	**18:30**	**83**	**9**	**0**	**0**	**0**	**3**	**8**			**103**	94.8
17:45	18:45	43	5	0	0	0	2	4			**54**	49.6
	P/TOT	**784**	**148**	**38**	**1**	**11**	**23**	**39**	**0**	**0**	**1044**	**1030**

SITE: **2**
LOCATION: Manor Road / Sainsbury's Access
TOTAL ARMS: A B C

from arm: **A**
to arm: **C**

period I period II
from: 07:30 15:00
to: 09:30 18:00

DATE: 02/10/2018
DAY: Tuesday

per quarter of an hour

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		00:15	00:15	00:15	00:15	00:15	00:15	00:15			00:15	00:15
07:30	**07:45**	2	0	0	0	0	0	0			**2**	2
07:45	08:00	0	0	0	0	0	0	0			**0**	0
08:00	08:15	1	0	0	0	0	0	0			**1**	1
08:15	08:30	1	0	0	0	0	0	0			**1**	1
08:30	**08:45**	2	0	0	0	0	0	0			**2**	2
08:45	09:00	0	1	0	0	0	0	1			**2**	1.2
09:00	09:15	0	0	0	0	0	0	0			**0**	0
09:15	09:30	2	0	0	0	0	0	0			**2**	2
15:00	15:15	2	0	0	0	0	0	0			**2**	2
15:15	15:30	7	0	0	0	0	0	0			**7**	7
15:30	**15:45**	2	1	0	0	0	0	0			**3**	3
15:45	16:00	7	0	0	0	0	0	1			**8**	7.2
16:00	16:15	2	0	0	0	0	0	0			**2**	2
16:15	16:30	6	0	0	0	0	0	0			**6**	6
16:30	**16:45**	5	0	0	0	0	0	0			**5**	5
16:45	17:00	3	0	0	0	0	0	0			**3**	3
17:00	17:15	4	1	0	0	0	0	0			**5**	5
17:15	17:30	3	0	1	0	0	0	0			**4**	4.5
17:30	**17:45**	4	0	0	0	0	0	0			**4**	4
17:45	18:00	0	0	0	0	0	0	0			**0**	0
	P/TOT	**53**	**3**	**1**	**0**	**0**	**0**	**2**	**0**	**0**	**59**	**57.9**
Period I Total:		8	1	0	0	0	0	1	0	0	**10**	9.2
Period II Total:		45	2	1	0	0	0	1	0	0	**49**	48.7

per hour

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU.h
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		01:00	01:00	01:00	01:00	01:00	01:00	01:00			01:00	01:00
07:30	**08:30**	**4**	**0**	**0**	**0**	**0**	**0**	**0**			**4**	4
07:45	08:45	4	0	0	0	0	0	0			**4**	4
08:00	09:00	4	1	0	0	0	0	1			**6**	5.2
08:15	09:15	3	1	0	0	0	0	1			**5**	4.2
08:30	**09:30**	**4**	**1**	**0**	**0**	**0**	**0**	**1**			**6**	**5.2**
08:45	09:45	2	1	0	0	0	0	1			**4**	3.2
09:00	10:00	2	0	0	0	0	0	0			**2**	2
09:15	10:15	2	0	0	0	0	0	0			**2**	2
15:00	16:00	18	1	0	0	0	0	1			**20**	19.2
15:15	16:15	18	1	0	0	0	0	1			**20**	19.2
15:30	**16:30**	**17**	**1**	**0**	**0**	**0**	**0**	**1**			**19**	**18.2**
15:45	16:45	20	0	0	0	0	0	1			**21**	20.2
16:00	17:00	16	0	0	0	0	0	0			**16**	16
16:15	17:15	18	1	0	0	0	0	0			**19**	19
16:30	**17:30**	**15**	**1**	**1**	**0**	**0**	**0**	**0**			**17**	17.5
16:45	17:45	14	1	1	0	0	0	0			**16**	16.5
17:00	18:00	11	1	1	0	0	0	0			**13**	**13.5**
17:15	18:15	7	0	1	0	0	0	0			**8**	8.5
17:30	**18:30**	**4**	**0**	**0**	**0**	**0**	**0**	**0**			**4**	4
17:45	18:45	0	0	0	0	0	0	0			**0**	0
	P/TOT	**53**	**3**	**1**	**0**	**0**	**0**	**2**	**0**	**0**	**59**	**57.9**

SITE: **2**
LOCATION: Manor Road / Sainsbury's Access
TOTAL ARMS: A B C

from arm: **A**
to arm: **all**

period I period II
from: 07:30 15:00
to: 09:30 18:00

DATE: 02/10/2018
DAY: Tuesday

per quarter of an hour

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		00:15	00:15	00:15	00:15	00:15	00:15	00:15			00:15	00:15
07:30	**07:45**	30	15	4	0	2	0	2			**53**	55.4
07:45	08:00	39	12	3	1	0	0	1			**56**	58
08:00	08:15	29	6	4	0	1	1	3			**44**	44
08:15	08:30	38	8	2	0	0	2	4			**54**	50.6
08:30	**08:45**	56	8	3	0	0	1	3			**71**	69.5
08:45	09:00	59	9	2	0	1	1	1			**73**	73.6
09:00	09:15	30	7	5	0	0	0	3			**45**	45.1
09:15	09:30	38	6	3	0	2	0	1			**50**	52.7
15:00	15:15	52	10	1	0	1	3	2			**69**	67.1
15:15	15:30	36	7	3	0	1	0	1			**48**	49.7
15:30	**15:45**	46	8	2	0	0	2	3			**61**	58.4
15:45	16:00	41	8	0	0	0	0	1			**50**	49.2
16:00	16:15	38	5	1	0	1	1	1			**47**	47.1
16:15	16:30	40	6	1	0	0	3	1			**51**	48.9
16:30	**16:45**	42	8	1	0	1	1	0			**53**	53.9
16:45	17:00	43	7	0	0	0	0	1			**51**	50.2
17:00	17:15	48	6	2	0	1	2	1			**60**	60
17:15	17:30	45	6	2	0	0	3	4			**60**	56
17:30	**17:45**	44	4	0	0	0	1	4			**53**	49.2
17:45	18:00	43	5	0	0	0	2	4			**54**	49.6
	P/TOT	**837**	**151**	**39**	**1**	**11**	**23**	**41**	**0**	**0**	**1103**	**1088**
Period I Total:		319	71	26	1	6	5	18	0	0	**446**	448.9
Period II Total:		518	80	13	0	5	18	23	0	0	**657**	639.3

per hour

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU.h
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		01:00	01:00	01:00	01:00	01:00	01:00	01:00			01:00	01:00
07:30	**08:30**	**136**	**41**	**13**	**1**	**3**	**3**	**10**			**207**	208
07:45	08:45	162	34	12	1	1	4	11			**225**	222.1
08:00	09:00	182	31	11	0	2	5	11			**242**	237.7
08:15	09:15	183	32	12	0	1	4	11			**243**	238.8
08:30	**09:30**	**183**	**30**	**13**	**0**	**3**	**2**	**8**			**239**	**240.9**
08:45	09:45	127	22	10	0	3	1	5			**168**	171.4
09:00	10:00	68	13	8	0	2	0	4			**95**	97.8
09:15	10:15	38	6	3	0	2	0	1			**50**	52.7
15:00	16:00	175	33	6	0	2	5	7			**228**	224.4
15:15	16:15	161	28	6	0	2	3	6			**206**	204.4
15:30	**16:30**	**165**	**27**	**4**	**0**	**1**	**6**	**6**			**209**	**203.6**
15:45	16:45	161	27	3	0	2	5	3			**201**	199.1
16:00	17:00	163	26	3	0	2	5	3			**202**	200.1
16:15	17:15	173	27	4	0	2	6	3			**215**	213
16:30	**17:30**	**178**	**27**	**5**	**0**	**2**	**6**	**6**			**224**	220.1
16:45	17:45	180	23	4	0	1	6	10			**224**	215.4
17:00	18:00	180	21	4	0	1	8	13			**227**	**214.8**
17:15	18:15	132	15	2	0	0	6	12			**167**	154.8
17:30	**18:30**	**87**	**9**	**0**	**0**	**0**	**3**	**8**			**107**	98.8
17:45	18:45	43	5	0	0	0	2	4			**54**	49.6
	P/TOT	**837**	**151**	**39**	**1**	**11**	**23**	**41**	**0**	**0**	**1103**	**1088**

9256 / MANOR ROAD, RICHMOND
October 2018
Classified Turning Count

SITE: **2**
LOCATION: Manor Road / Sainsbury's Access
TOTAL ARMS: A B C

from arm: **all**
to arm: **A**

period I period II
from: 07:30 15:00
to: 09:30 18:00

DATE: 02/10/2018
DAY: Tuesday

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		00:15	00:15	00:15	00:15	00:15	00:15	00:15			00:15	00:15
07:30	**07:45**	77	13	3	0	5	4	2			**104**	106.5
07:45	08:00	48	8	1	0	5	1	2			**65**	68.3
08:00	08:15	61	10	1	1	1	5	5			**84**	79.8
08:15	08:30	59	10	2	1	2	1	4			**79**	79.5
08:30	**08:45**	62	11	1	0	0	4	3			**81**	76.7
08:45	09:00	82	14	1	1	0	1	3			**102**	100.8
09:00	09:15	68	4	2	0	0	1	1			**76**	75.6
09:15	09:30	68	10	1	0	3	1	0			**83**	85.9
15:00	15:15	64	8	3	0	1	1	4			**81**	79.7
15:15	15:30	45	12	5	1	3	1	1			**68**	73.4
15:30	**15:45**	74	12	1	2	1	1	1			**92**	94.7
15:45	16:00	53	11	3	0	3	1	0			**71**	74.9
16:00	16:15	66	12	2	1	1	1	1			**84**	85.9
16:15	16:30	66	13	1	1	2	0	2			**85**	87.2
16:30	**16:45**	59	10	3	0	1	1	4			**78**	76.7
16:45	17:00	62	14	1	0	2	1	1			**81**	82.1
17:00	17:15	60	18	0	0	3	1	2			**84**	84.8
17:15	17:30	89	16	1	0	1	1	4			**112**	109.7
17:30	**17:45**	81	8	5	0	1	4	2			**101**	100.5
17:45	18:00	77	12	0	0	2	2	2			**95**	94.2
	P/TOT	**1321**	**226**	**37**	**8**	**37**	**33**	**44**	**0**	**0**	**1706**	**1717**
Period I Total:		525	80	12	3	16	18	20	0	0	**674**	673.1
Period II Total:		796	146	25	5	21	15	24	0	0	**1032**	1044

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU.h
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		01:00	01:00	01:00	01:00	01:00	01:00	01:00			01:00	01:00
07:30	**08:30**	**245**	**41**	**7**	**2**	**13**	**11**	**13**			**332**	334.1
07:45	08:45	230	39	5	2	8	11	14			**309**	304.3
08:00	09:00	264	45	5	3	3	11	15			**346**	336.8
08:15	09:15	271	39	6	2	2	7	11			**338**	332.6
08:30	**09:30**	**280**	**39**	**5**	**1**	**3**	**7**	**7**			**342**	**339**
08:45	09:45	218	28	4	1	3	3	4			**261**	262.3
09:00	10:00	136	14	3	0	3	2	1			**159**	161.5
09:15	10:15	68	10	1	0	3	1	0			**83**	85.9
15:00	16:00	236	43	12	3	8	4	6			**312**	322.7
15:15	16:15	238	47	11	4	8	4	3			**315**	328.9
15:30	**16:30**	**259**	**48**	**7**	**4**	**7**	**3**	**4**			**332**	**342.7**
15:45	16:45	244	46	9	2	7	3	7			**318**	324.7
16:00	17:00	253	49	7	2	6	3	8			**328**	331.9
16:15	17:15	247	55	5	1	8	3	9			**328**	330.8
16:30	**17:30**	**270**	**58**	**5**	**0**	**7**	**4**	**11**			**355**	353.3
16:45	17:45	292	56	7	0	7	7	9			**378**	377.1
17:00	18:00	307	54	6	0	7	8	10			**392**	**389.2**
17:15	18:15	247	36	6	0	4	7	8			**308**	304.4
17:30	**18:30**	**158**	**20**	**5**	**0**	**3**	**6**	**4**			**196**	194.7
17:45	18:45	77	12	0	0	2	2	2			**95**	94.2
	P/TOT	**1321**	**226**	**37**	**8**	**37**	**33**	**44**	**0**	**0**	**1706**	**1717**

SITE: **2**
LOCATION: Manor Road / Sainsbury's Access
TOTAL ARMS:

from arm: **B**
to arm: **A**

period I period II
from: 07:30 15:00
to: 09:30 18:00

DATE: 02/10/2018
DAY: Tuesday

per quarter of an hour

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		00:15	00:15	00:15	00:15	00:15	00:15	00:15			00:15	00:15
07:30	**07:45**	69	12	3	0	3	4	2			**93**	93.5
07:45	08:00	45	5	1	0	2	1	2			**56**	56.3
08:00	08:15	53	9	1	1	0	4	5			**73**	68.4
08:15	08:30	54	7	2	1	0	1	4			**69**	67.5
08:30	**08:45**	57	9	1	0	0	4	3			**74**	69.7
08:45	09:00	76	13	0	1	0	1	3			**94**	92.3
09:00	09:15	54	3	2	0	0	1	1			**61**	60.6
09:15	09:30	57	9	1	0	1	1	0			**69**	69.9
15:00	15:15	51	7	3	0	0	1	4			**66**	63.7
15:15	15:30	36	11	5	1	1	1	1			**56**	59.4
15:30	**15:45**	65	12	1	2	0	1	1			**82**	83.7
15:45	16:00	40	9	3	0	1	1	0			**54**	55.9
16:00	16:15	51	11	2	1	0	1	0			**66**	67.7
16:15	16:30	49	11	1	1	0	0	2			**64**	64.2
16:30	**16:45**	51	10	3	0	0	1	3			**68**	66.5
16:45	17:00	50	11	1	0	1	1	1			**65**	65.1
17:00	17:15	48	17	0	0	1	1	2			**69**	67.8
17:15	17:30	84	15	1	0	0	1	4			**105**	101.7
17:30	**17:45**	64	8	4	0	0	4	1			**81**	79.8
17:45	18:00	72	12	0	0	0	1	2			**87**	84.8
	P/TOT	**1126**	**201**	**35**	**8**	**10**	**31**	**41**	**0**	**0**	**1452**	**1439**
Period I Total:		465	67	11	3	6	17	20	0	0	**589**	578.2
Period II Total:		661	134	24	5	4	14	21	0	0	**863**	860.3

per hour

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU.h
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		01:00	01:00	01:00	01:00	01:00	01:00	01:00			01:00	01:00
07:30	**08:30**	**221**	**33**	**7**	**2**	**5**	**10**	**13**			**291**	285.7
07:45	08:45	209	30	5	2	2	10	14			**272**	261.9
08:00	09:00	240	38	4	3	0	10	15			**310**	297.9
08:15	09:15	241	32	5	2	0	7	11			**298**	290.1
08:30	**09:30**	**244**	**34**	**4**	**1**	**1**	**7**	**7**			**298**	**292.5**
08:45	09:45	187	25	3	1	1	3	4			**224**	222.8
09:00	10:00	111	12	3	0	1	2	1			**130**	130.5
09:15	10:15	57	9	1	0	1	1	0			**69**	69.9
15:00	16:00	192	39	12	3	2	4	6			**258**	262.7
15:15	16:15	192	43	11	4	2	4	2			**258**	266.7
15:30	**16:30**	**205**	**43**	**7**	**4**	**1**	**3**	**3**			**266**	**271.5**
15:45	16:45	191	41	9	2	1	3	5			**252**	254.3
16:00	17:00	201	43	7	2	1	3	6			**263**	263.5
16:15	17:15	198	49	5	1	2	3	8			**266**	263.6
16:30	**17:30**	**233**	**53**	**5**	**0**	**2**	**4**	**10**			**307**	301.1
16:45	17:45	246	51	6	0	2	7	8			**320**	314.4
17:00	18:00	268	52	5	0	1	7	9			**342**	**334.1**
17:15	18:15	220	35	5	0	0	6	7			**273**	266.3
17:30	**18:30**	**136**	**20**	**4**	**0**	**0**	**5**	**3**			**168**	164.6
17:45	18:45	72	12	0	0	0	1	2			**87**	84.8
	P/TOT	**1126**	**201**	**35**	**8**	**10**	**31**	**41**	**0**	**0**	**1452**	**1439**

SITE: **2**
LOCATION: Manor Road / Sainsbury's Access
TOTAL ARMS: A B C

from arm: **B**
to arm: **B**

period I period II
from: 07:30 15:00
to: 09:30 18:00

DATE: 02/10/2018
DAY: Tuesday

per quarter of an hour

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		00:15	00:15	00:15	00:15	00:15	00:15	00:15			00:15	00:15
07:30	**07:45**	0	0	0	0	0	0	0			**0**	0
07:45	08:00	0	0	0	0	0	0	0			**0**	0
08:00	08:15	0	0	0	0	0	0	0			**0**	0
08:15	08:30	0	0	0	0	0	0	0			**0**	0
08:30	**08:45**	0	0	0	0	0	0	0			**0**	0
08:45	09:00	0	0	0	0	0	0	0			**0**	0
09:00	09:15	0	0	0	0	0	0	0			**0**	0
09:15	09:30	0	0	0	0	0	0	0			**0**	0
15:00	15:15	0	0	0	0	0	0	0			**0**	0
15:15	15:30	0	0	0	0	0	0	0			**0**	0
15:30	**15:45**	0	0	0	0	0	0	0			**0**	0
15:45	16:00	0	0	0	0	0	0	0			**0**	0
16:00	16:15	0	0	0	0	0	0	0			**0**	0
16:15	16:30	0	0	0	0	0	0	0			**0**	0
16:30	**16:45**	0	0	0	0	0	0	0			**0**	0
16:45	17:00	0	0	0	0	0	0	0			**0**	0
17:00	17:15	0	0	0	0	0	0	0			**0**	0
17:15	17:30	0	0	0	0	0	0	0			**0**	0
17:30	**17:45**	0	0	0	0	0	0	0			**0**	0
17:45	18:00	0	0	0	0	0	0	0			**0**	0
	P/TOT	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Period I Total:		0	0	0	0	0	0	0	0	0	**0**	0
Period II Total:		0	0	0	0	0	0	0	0	0	**0**	0

per hour

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU.h
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		01:00	01:00	01:00	01:00	01:00	01:00	01:00			01:00	01:00
07:30	**08:30**	**0**	**0**	**0**	**0**	**0**	**0**	**0**			**0**	0
07:45	08:45	0	0	0	0	0	0	0			**0**	0
08:00	09:00	0	0	0	0	0	0	0			**0**	0
08:15	09:15	0	0	0	0	0	0	0			**0**	0
08:30	**09:30**	**0**	**0**	**0**	**0**	**0**	**0**	**0**			**0**	**0**
08:45	09:45	0	0	0	0	0	0	0			**0**	0
09:00	10:00	0	0	0	0	0	0	0			**0**	0
09:15	10:15	0	0	0	0	0	0	0			**0**	0
15:00	16:00	0	0	0	0	0	0	0			**0**	0
15:15	16:15	0	0	0	0	0	0	0			**0**	0
15:30	**16:30**	**0**	**0**	**0**	**0**	**0**	**0**	**0**			**0**	**0**
15:45	16:45	0	0	0	0	0	0	0			**0**	0
16:00	17:00	0	0	0	0	0	0	0			**0**	0
16:15	17:15	0	0	0	0	0	0	0			**0**	0
16:30	**17:30**	**0**	**0**	**0**	**0**	**0**	**0**	**0**			**0**	0
16:45	17:45	0	0	0	0	0	0	0			**0**	0
17:00	18:00	0	0	0	0	0	0	0			**0**	**0**
17:15	18:15	0	0	0	0	0	0	0			**0**	0
17:30	**18:30**	**0**	**0**	**0**	**0**	**0**	**0**	**0**			**0**	0
17:45	18:45	0	0	0	0	0	0	0			**0**	0
	P/TOT	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

SITE: **2**
LOCATION: Manor Road / Sainsbury's Access
TOTAL ARMS: A B C

from arm: **B**
to arm: **C**

period I period II
from: 07:30 15:00
to: 09:30 18:00

DATE: 02/10/2018
DAY: Tuesday

per quarter of an hour

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		00:15	00:15	00:15	00:15	00:15	00:15	00:15			00:15	00:15
07:30	**07:45**	11	2	1	0	0	1	0			**15**	14.9
07:45	08:00	4	1	0	0	0	1	0			**6**	5.4
08:00	08:15	10	1	0	0	0	0	0			**11**	11
08:15	08:30	5	1	0	0	0	0	1			**7**	6.2
08:30	**08:45**	11	1	0	0	0	0	0			**12**	12
08:45	09:00	9	1	0	0	0	0	0			**10**	10
09:00	09:15	16	3	0	0	0	0	1			**20**	19.2
09:15	09:30	17	0	1	0	0	0	0			**18**	18.5
15:00	15:15	9	1	0	0	0	0	1			**11**	10.2
15:15	15:30	11	1	0	0	0	0	0			**12**	12
15:30	**15:45**	17	1	0	0	0	0	0			**18**	18
15:45	16:00	15	1	0	0	0	0	1			**17**	16.2
16:00	16:15	21	0	0	0	0	2	1			**24**	22
16:15	16:30	7	0	0	0	0	0	0			**7**	7
16:30	**16:45**	22	1	0	0	0	0	0			**23**	23
16:45	17:00	9	0	0	0	0	0	2			**11**	9.4
17:00	17:15	17	0	0	0	0	0	2			**19**	17.4
17:15	17:30	31	3	0	0	0	0	1			**35**	34.2
17:30	**17:45**	23	1	0	0	0	1	2			**27**	24.8
17:45	18:00	15	2	1	0	0	0	1			**19**	18.7
	P/TOT	**280**	**21**	**3**	**0**	**0**	**5**	**13**	**0**	**0**	**322**	**310.1**
Period I Total:		83	10	2	0	0	2	2	0	0	**99**	97.2
Period II Total:		197	11	1	0	0	3	11	0	0	**223**	212.9

per hour

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU.h
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		01:00	01:00	01:00	01:00	01:00	01:00	01:00			01:00	01:00
07:30	**08:30**	**30**	**5**	**1**	**0**	**0**	**2**	**1**			**39**	37.5
07:45	08:45	30	4	0	0	0	1	1			**36**	34.6
08:00	09:00	35	4	0	0	0	0	1			**40**	39.2
08:15	09:15	41	6	0	0	0	0	2			**49**	47.4
08:30	**09:30**	**53**	**5**	**1**	**0**	**0**	**0**	**1**			**60**	**59.7**
08:45	09:45	42	4	1	0	0	0	1			**48**	47.7
09:00	10:00	33	3	1	0	0	0	1			**38**	37.7
09:15	10:15	17	0	1	0	0	0	0			**18**	18.5
15:00	16:00	52	4	0	0	0	0	2			**58**	56.4
15:15	16:15	64	3	0	0	0	2	2			**71**	68.2
15:30	**16:30**	**60**	**2**	**0**	**0**	**0**	**2**	**2**			**66**	**63.2**
15:45	16:45	65	2	0	0	0	2	2			**71**	68.2
16:00	17:00	59	1	0	0	0	2	3			**65**	61.4
16:15	17:15	55	1	0	0	0	0	4			**60**	56.8
16:30	**17:30**	**79**	**4**	**0**	**0**	**0**	**0**	**5**			**88**	84
16:45	17:45	80	4	0	0	0	1	7			**92**	85.8
17:00	18:00	86	6	1	0	0	1	6			**100**	**95.1**
17:15	18:15	69	6	1	0	0	1	4			**81**	77.7
17:30	**18:30**	**38**	**3**	**1**	**0**	**0**	**1**	**3**			**46**	43.5
17:45	18:45	15	2	1	0	0	0	1			**19**	18.7
	P/TOT	**280**	**21**	**3**	**0**	**0**	**5**	**13**	**0**	**0**	**322**	**310.1**

SITE: **2**
LOCATION: Manor Road / Sainsbury's Access
TOTAL ARMS: A B C

from arm: **B**
to arm: **all**

period I period II
from: 07:30 15:00
to: 09:30 18:00

DATE: 02/10/2018
DAY: Tuesday

per quarter of an hour

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		00:15	00:15	00:15	00:15	00:15	00:15	00:15			00:15	00:15
07:30	**07:45**	80	14	4	0	3	5	2			**108**	108.4
07:45	08:00	49	6	1	0	2	2	2			**62**	61.7
08:00	08:15	63	10	1	1	0	4	5			**84**	79.4
08:15	08:30	59	8	2	1	0	1	5			**76**	73.7
08:30	**08:45**	68	10	1	0	0	4	3			**86**	81.7
08:45	09:00	85	14	0	1	0	1	3			**104**	102.3
09:00	09:15	70	6	2	0	0	1	2			**81**	79.8
09:15	09:30	74	9	2	0	1	1	0			**87**	88.4
15:00	15:15	60	8	3	0	0	1	5			**77**	73.9
15:15	15:30	47	12	5	1	1	1	1			**68**	71.4
15:30	**15:45**	82	13	1	2	0	1	1			**100**	101.7
15:45	16:00	55	10	3	0	1	1	1			**71**	72.1
16:00	16:15	72	11	2	1	0	3	1			**90**	89.7
16:15	16:30	56	11	1	1	0	0	2			**71**	71.2
16:30	**16:45**	73	11	3	0	0	1	3			**91**	89.5
16:45	17:00	59	11	1	0	1	1	3			**76**	74.5
17:00	17:15	65	17	0	0	1	1	4			**88**	85.2
17:15	17:30	115	18	1	0	0	1	5			**140**	135.9
17:30	**17:45**	87	9	4	0	0	5	3			**108**	104.6
17:45	18:00	87	14	1	0	0	1	3			**106**	103.5
	P/TOT	**1406**	**222**	**38**	**8**	**10**	**36**	**54**	**0**	**0**	**1774**	**1749**
Period I Total:		548	77	13	3	6	19	22	0	0	**688**	675.4
Period II Total:		858	145	25	5	4	17	32	0	0	**1086**	1073

per hour

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU.h
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		01:00	01:00	01:00	01:00	01:00	01:00	01:00			01:00	01:00
07:30	**08:30**	**251**	**38**	**8**	**2**	**5**	**12**	**14**			**330**	323.2
07:45	08:45	239	34	5	2	2	11	15			**308**	296.5
08:00	09:00	275	42	4	3	0	10	16			**350**	337.1
08:15	09:15	282	38	5	2	0	7	13			**347**	337.5
08:30	**09:30**	**297**	**39**	**5**	**1**	**1**	**7**	**8**			**358**	**352.2**
08:45	09:45	229	29	4	1	1	3	5			**272**	270.5
09:00	10:00	144	15	4	0	1	2	2			**168**	168.2
09:15	10:15	74	9	2	0	1	1	0			**87**	88.4
15:00	16:00	244	43	12	3	2	4	8			**316**	319.1
15:15	16:15	256	46	11	4	2	6	4			**329**	334.9
15:30	**16:30**	**265**	**45**	**7**	**4**	**1**	**5**	**5**			**332**	**334.7**
15:45	16:45	256	43	9	2	1	5	7			**323**	322.5
16:00	17:00	260	44	7	2	1	5	9			**328**	324.9
16:15	17:15	253	50	5	1	2	3	12			**326**	320.4
16:30	**17:30**	**312**	**57**	**5**	**0**	**2**	**4**	**15**			**395**	385.1
16:45	17:45	326	55	6	0	2	8	15			**412**	400.2
17:00	18:00	354	58	6	0	1	8	15			**442**	**429.2**
17:15	18:15	289	41	6	0	0	7	11			**354**	344
17:30	**18:30**	**174**	**23**	**5**	**0**	**0**	**6**	**6**			**214**	208.1
17:45	18:45	87	14	1	0	0	1	3			**106**	103.5
	P/TOT	**1406**	**222**	**38**	**8**	**10**	**36**	**54**	**0**	**0**	**1774**	**1749**

SITE: **2**
LOCATION: Manor Road / Sainsbury's Access
TOTAL ARMS: A B C

from arm: **all**
to arm: **B**

period I period II
from: 07:30 15:00
to: 09:30 18:00

DATE: 02/10/2018
DAY: Tuesday

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		00:15	00:15	00:15	00:15	00:15	00:15	00:15			00:15	00:15
07:30	**07:45**	33	16	4	0	2	0	2			**57**	59.4
07:45	08:00	44	14	4	1	0	0	1			**64**	66.5
08:00	08:15	38	8	4	0	1	1	3			**55**	55
08:15	08:30	42	9	3	0	0	2	6			**62**	57.5
08:30	**08:45**	60	9	4	0	0	1	3			**77**	76
08:45	09:00	67	8	2	0	1	2	0			**80**	80.8
09:00	09:15	38	7	5	0	0	0	3			**53**	53.1
09:15	09:30	39	8	4	0	2	0	2			**55**	57.4
15:00	15:15	66	11	1	0	1	3	2			**84**	82.1
15:15	15:30	48	8	3	0	1	0	4			**64**	63.3
15:30	**15:45**	64	7	3	0	0	2	7			**83**	77.7
15:45	16:00	45	10	0	0	0	0	1			**56**	55.2
16:00	16:15	49	7	2	0	1	1	1			**61**	61.6
16:15	16:30	55	7	1	0	0	4	6			**73**	66.3
16:30	**16:45**	50	10	1	0	1	1	0			**63**	63.9
16:45	17:00	57	8	0	0	0	0	1			**66**	65.2
17:00	17:15	60	6	2	0	1	3	3			**75**	72.8
17:15	17:30	59	7	3	0	0	3	7			**79**	73.1
17:30	**17:45**	62	6	1	0	0	2	6			**77**	71.5
17:45	18:00	57	5	0	0	0	2	4			**68**	63.6
	P/TOT	**1033**	**171**	**47**	**1**	**11**	**27**	**62**	**0**	**0**	**1352**	**1322**
Period I Total:		361	79	30	1	6	6	20	0	0	**503**	505.7
Period II Total:		672	92	17	0	5	21	42	0	0	**849**	816.3

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU.h
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		01:00	01:00	01:00	01:00	01:00	01:00	01:00			01:00	01:00
07:30	**08:30**	**157**	**47**	**15**	**1**	**3**	**3**	**12**			**238**	238.4
07:45	08:45	184	40	15	1	1	4	13			**258**	255
08:00	09:00	207	34	13	0	2	6	12			**274**	269.3
08:15	09:15	207	33	14	0	1	5	12			**272**	267.4
08:30	**09:30**	**204**	**32**	**15**	**0**	**3**	**3**	**8**			**265**	**267.3**
08:45	09:45	144	23	11	0	3	2	5			**188**	191.3
09:00	10:00	77	15	9	0	2	0	5			**108**	110.5
09:15	10:15	39	8	4	0	2	0	2			**55**	57.4
15:00	16:00	223	36	7	0	2	5	14			**287**	278.3
15:15	16:15	206	32	8	0	2	3	13			**264**	257.8
15:30	**16:30**	**213**	**31**	**6**	**0**	**1**	**7**	**15**			**273**	**260.8**
15:45	16:45	199	34	4	0	2	6	8			**253**	247
16:00	17:00	211	32	4	0	2	6	8			**263**	257
16:15	17:15	222	31	4	0	2	8	10			**277**	268.2
16:30	**17:30**	**226**	**31**	**6**	**0**	**2**	**7**	**11**			**283**	275
16:45	17:45	238	27	6	0	1	8	17			**297**	282.6
17:00	18:00	238	24	6	0	1	10	20			**299**	**281**
17:15	18:15	178	18	4	0	0	7	17			**224**	208.2
17:30	**18:30**	**119**	**11**	**1**	**0**	**0**	**4**	**10**			**145**	135.1
17:45	18:45	57	5	0	0	0	2	4			**68**	63.6
	P/TOT	**1033**	**171**	**47**	**1**	**11**	**27**	**62**	**0**	**0**	**1352**	**1322**

SITE: **2**
LOCATION: Manor Road / Sainsbury's Access
TOTAL ARMS:

from arm: **C**
to arm: **A**

period I period II
from: 07:30 15:00
to: 09:30 18:00

DATE: 02/10/2018
DAY: Tuesday

per quarter of an hour

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		00:15	00:15	00:15	00:15	00:15	00:15	00:15			00:15	00:15
07:30	**07:45**	8	1	0	0	2	0	0			**11**	13
07:45	08:00	3	3	0	0	3	0	0			**9**	12
08:00	08:15	8	1	0	0	1	1	0			**11**	11.4
08:15	08:30	5	3	0	0	2	0	0			**10**	12
08:30	**08:45**	5	2	0	0	0	0	0			**7**	7
08:45	09:00	6	1	1	0	0	0	0			**8**	8.5
09:00	09:15	14	1	0	0	0	0	0			**15**	15
09:15	09:30	11	1	0	0	2	0	0			**14**	16
15:00	15:15	13	1	0	0	1	0	0			**15**	16
15:15	15:30	9	1	0	0	2	0	0			**12**	14
15:30	**15:45**	9	0	0	0	1	0	0			**10**	11
15:45	16:00	13	2	0	0	2	0	0			**17**	19
16:00	16:15	15	1	0	0	1	0	1			**18**	18.2
16:15	16:30	17	2	0	0	2	0	0			**21**	23
16:30	**16:45**	8	0	0	0	1	0	1			**10**	10.2
16:45	17:00	12	3	0	0	1	0	0			**16**	17
17:00	17:15	12	1	0	0	2	0	0			**15**	17
17:15	17:30	5	1	0	0	1	0	0			**7**	8
17:30	**17:45**	17	0	1	0	1	0	1			**20**	20.7
17:45	18:00	5	0	0	0	2	1	0			**8**	9.4
	P/TOT	**195**	**25**	**2**	**0**	**27**	**2**	**3**	**0**	**0**	**254**	**278.4**
Period I Total:		60	13	1	0	10	1	0	0	0	**85**	94.9
Period II Total:		135	12	1	0	17	1	3	0	0	**169**	183.5

per hour

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU.h
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		01:00	01:00	01:00	01:00	01:00	01:00	01:00			01:00	01:00
07:30	**08:30**	**24**	**8**	**0**	**0**	**8**	**1**	**0**			**41**	48.4
07:45	08:45	21	9	0	0	6	1	0			**37**	42.4
08:00	09:00	24	7	1	0	3	1	0			**36**	38.9
08:15	09:15	30	7	1	0	2	0	0			**40**	42.5
08:30	**09:30**	**36**	**5**	**1**	**0**	**2**	**0**	**0**			**44**	**46.5**
08:45	09:45	31	3	1	0	2	0	0			**37**	39.5
09:00	10:00	25	2	0	0	2	0	0			**29**	31
09:15	10:15	11	1	0	0	2	0	0			**14**	16
15:00	16:00	44	4	0	0	6	0	0			**54**	60
15:15	16:15	46	4	0	0	6	0	1			**57**	62.2
15:30	**16:30**	**54**	**5**	**0**	**0**	**6**	**0**	**1**			**66**	**71.2**
15:45	16:45	53	5	0	0	6	0	2			**66**	70.4
16:00	17:00	52	6	0	0	5	0	2			**65**	68.4
16:15	17:15	49	6	0	0	6	0	1			**62**	67.2
16:30	**17:30**	**37**	**5**	**0**	**0**	**5**	**0**	**1**			**48**	52.2
16:45	17:45	46	5	1	0	5	0	1			**58**	62.7
17:00	18:00	39	2	1	0	6	1	1			**50**	**55.1**
17:15	18:15	27	1	1	0	4	1	1			**35**	38.1
17:30	**18:30**	**22**	**0**	**1**	**0**	**3**	**1**	**1**			**28**	30.1
17:45	18:45	5	0	0	0	2	1	0			**8**	9.4
	P/TOT	**195**	**25**	**2**	**0**	**27**	**2**	**3**	**0**	**0**	**254**	**278.4**

SITE: **2**
LOCATION: Manor Road / Sainsbury's Access
TOTAL ARMS: A B C

from arm: **C**
to arm: **B**

period I period II
from: 07:30 15:00
to: 09:30 18:00

DATE: 02/10/2018
DAY: Tuesday

per quarter of an hour

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		00:15	00:15	00:15	00:15	00:15	00:15	00:15			00:15	00:15
07:30	**07:45**	5	1	0	0	0	0	0			**6**	6
07:45	08:00	5	2	1	0	0	0	0			**8**	8.5
08:00	08:15	10	2	0	0	0	0	0			**12**	12
08:15	08:30	5	1	1	0	0	0	2			**9**	7.9
08:30	**08:45**	6	1	1	0	0	0	0			**8**	8.5
08:45	09:00	8	0	0	0	0	1	0			**9**	8.4
09:00	09:15	8	0	0	0	0	0	0			**8**	8
09:15	09:30	3	2	1	0	0	0	1			**7**	6.7
15:00	15:15	16	1	0	0	0	0	0			**17**	17
15:15	15:30	19	1	0	0	0	0	3			**23**	20.6
15:30	**15:45**	20	0	1	0	0	0	4			**25**	22.3
15:45	16:00	11	2	0	0	0	0	1			**14**	13.2
16:00	16:15	13	2	1	0	0	0	0			**16**	16.5
16:15	16:30	21	1	0	0	0	1	5			**28**	23.4
16:30	**16:45**	13	2	0	0	0	0	0			**15**	15
16:45	17:00	17	1	0	0	0	0	0			**18**	18
17:00	17:15	16	1	0	0	0	1	2			**20**	17.8
17:15	17:30	17	1	2	0	0	0	3			**23**	21.6
17:30	**17:45**	22	2	1	0	0	1	2			**28**	26.3
17:45	18:00	14	0	0	0	0	0	0			**14**	14
	P/TOT	**249**	**23**	**9**	**0**	**0**	**4**	**23**	**0**	**0**	**308**	**291.7**
Period I Total:		50	9	4	0	0	1	3	0	0	**67**	66
Period II Total:		199	14	5	0	0	3	20	0	0	**241**	225.7

per hour

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU.h
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		01:00	01:00	01:00	01:00	01:00	01:00	01:00			01:00	01:00
07:30	**08:30**	**25**	**6**	**2**	**0**	**0**	**0**	**2**			**35**	34.4
07:45	08:45	26	6	3	0	0	0	2			**37**	36.9
08:00	09:00	29	4	2	0	0	1	2			**38**	36.8
08:15	09:15	27	2	2	0	0	1	2			**34**	32.8
08:30	**09:30**	**25**	**3**	**2**	**0**	**0**	**1**	**1**			**32**	**31.6**
08:45	09:45	19	2	1	0	0	1	1			**24**	23.1
09:00	10:00	11	2	1	0	0	0	1			**15**	14.7
09:15	10:15	3	2	1	0	0	0	1			**7**	6.7
15:00	16:00	66	4	1	0	0	0	8			**79**	73.1
15:15	16:15	63	5	2	0	0	0	8			**78**	72.6
15:30	**16:30**	**65**	**5**	**2**	**0**	**0**	**1**	**10**			**83**	**75.4**
15:45	16:45	58	7	1	0	0	1	6			**73**	68.1
16:00	17:00	64	6	1	0	0	1	5			**77**	72.9
16:15	17:15	67	5	0	0	0	2	7			**81**	74.2
16:30	**17:30**	**63**	**5**	**2**	**0**	**0**	**1**	**5**			**76**	72.4
16:45	17:45	72	5	3	0	0	2	7			**89**	83.7
17:00	18:00	69	4	3	0	0	2	7			**85**	**79.7**
17:15	18:15	53	3	3	0	0	1	5			**65**	61.9
17:30	**18:30**	**36**	**2**	**1**	**0**	**0**	**1**	**2**			**42**	40.3
17:45	18:45	14	0	0	0	0	0	0			**14**	14
	P/TOT	**249**	**23**	**9**	**0**	**0**	**4**	**23**	**0**	**0**	**308**	**291.7**

SITE: **2**
LOCATION: Manor Road / Sainsbury's Access
TOTAL ARMS: A B C

from arm: **C**
to arm: **C**

period I period II
from: 07:30 15:00
to: 09:30 18:00

DATE: 02/10/2018
DAY: Tuesday

per quarter of an hour

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		00:15	00:15	00:15	00:15	00:15	00:15	00:15			00:15	00:15
07:30	**07:45**	0	0	0	0	0	0	0			**0**	0
07:45	08:00	0	0	0	0	0	0	0			**0**	0
08:00	08:15	0	0	0	0	0	0	0			**0**	0
08:15	08:30	0	0	0	0	0	0	0			**0**	0
08:30	**08:45**	0	0	0	0	0	0	0			**0**	0
08:45	09:00	0	0	0	0	0	0	0			**0**	0
09:00	09:15	0	0	0	0	0	0	0			**0**	0
09:15	09:30	0	0	0	0	0	0	0			**0**	0
15:00	15:15	0	0	0	0	0	0	0			**0**	0
15:15	15:30	0	0	0	0	0	0	0			**0**	0
15:30	**15:45**	0	0	0	0	0	0	0			**0**	0
15:45	16:00	0	0	0	0	0	0	0			**0**	0
16:00	16:15	0	0	0	0	0	0	0			**0**	0
16:15	16:30	0	0	0	0	0	0	0			**0**	0
16:30	**16:45**	0	0	0	0	0	0	0			**0**	0
16:45	17:00	0	0	0	0	0	0	0			**0**	0
17:00	17:15	0	0	0	0	0	0	0			**0**	0
17:15	17:30	0	0	0	0	0	0	0			**0**	0
17:30	**17:45**	0	0	0	0	0	0	0			**0**	0
17:45	18:00	0	0	0	0	0	0	0			**0**	0
	P/TOT	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Period I Total:		0	0	0	0	0	0	0	0	0	**0**	0
Period II Total:		0	0	0	0	0	0	0	0	0	**0**	0

per hour

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU.h
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		01:00	01:00	01:00	01:00	01:00	01:00	01:00			01:00	01:00
07:30	**08:30**	**0**	**0**	**0**	**0**	**0**	**0**	**0**			**0**	0
07:45	08:45	0	0	0	0	0	0	0			**0**	0
08:00	09:00	0	0	0	0	0	0	0			**0**	0
08:15	09:15	0	0	0	0	0	0	0			**0**	0
08:30	**09:30**	**0**	**0**	**0**	**0**	**0**	**0**	**0**			**0**	**0**
08:45	09:45	0	0	0	0	0	0	0			**0**	0
09:00	10:00	0	0	0	0	0	0	0			**0**	0
09:15	10:15	0	0	0	0	0	0	0			**0**	0
15:00	16:00	0	0	0	0	0	0	0			**0**	0
15:15	16:15	0	0	0	0	0	0	0			**0**	0
15:30	**16:30**	**0**	**0**	**0**	**0**	**0**	**0**	**0**			**0**	**0**
15:45	16:45	0	0	0	0	0	0	0			**0**	0
16:00	17:00	0	0	0	0	0	0	0			**0**	0
16:15	17:15	0	0	0	0	0	0	0			**0**	0
16:30	**17:30**	**0**	**0**	**0**	**0**	**0**	**0**	**0**			**0**	0
16:45	17:45	0	0	0	0	0	0	0			**0**	0
17:00	18:00	0	0	0	0	0	0	0			**0**	**0**
17:15	18:15	0	0	0	0	0	0	0			**0**	0
17:30	**18:30**	**0**	**0**	**0**	**0**	**0**	**0**	**0**			**0**	0
17:45	18:45	0	0	0	0	0	0	0			**0**	0
	P/TOT	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

SITE: **2**
LOCATION: Manor Road / Sainsbury's Access
TOTAL ARMS: A B C

from arm: **C**
to arm: **all**

period I period II
from: 07:30 15:00
to: 09:30 18:00

DATE: 02/10/2018
DAY: Tuesday

per quarter of an hour

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		00:15	00:15	00:15	00:15	00:15	00:15	00:15			00:15	00:15
07:30	**07:45**	13	2	0	0	2	0	0			**17**	19
07:45	08:00	8	5	1	0	3	0	0			**17**	20.5
08:00	08:15	18	3	0	0	1	1	0			**23**	23.4
08:15	08:30	10	4	1	0	2	0	2			**19**	19.9
08:30	**08:45**	11	3	1	0	0	0	0			**15**	15.5
08:45	09:00	14	1	1	0	0	1	0			**17**	16.9
09:00	09:15	22	1	0	0	0	0	0			**23**	23
09:15	09:30	14	3	1	0	2	0	1			**21**	22.7
15:00	15:15	29	2	0	0	1	0	0			**32**	33
15:15	15:30	28	2	0	0	2	0	3			**35**	34.6
15:30	**15:45**	29	0	1	0	1	0	4			**35**	33.3
15:45	16:00	24	4	0	0	2	0	1			**31**	32.2
16:00	16:15	28	3	1	0	1	0	1			**34**	34.7
16:15	16:30	38	3	0	0	2	1	5			**49**	46.4
16:30	**16:45**	21	2	0	0	1	0	1			**25**	25.2
16:45	17:00	29	4	0	0	1	0	0			**34**	35
17:00	17:15	28	2	0	0	2	1	2			**35**	34.8
17:15	17:30	22	2	2	0	1	0	3			**30**	29.6
17:30	**17:45**	39	2	2	0	1	1	3			**48**	47
17:45	18:00	19	0	0	0	2	1	0			**22**	23.4
	P/TOT	**444**	**48**	**11**	**0**	**27**	**6**	**26**	**0**	**0**	**562**	**570.1**
Period I Total:		110	22	5	0	10	2	3	0	0	**152**	160.9
Period II Total:		334	26	6	0	17	4	23	0	0	**410**	409.2

per hour

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU.h
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		01:00	01:00	01:00	01:00	01:00	01:00	01:00			01:00	01:00
07:30	**08:30**	**49**	**14**	**2**	**0**	**8**	**1**	**2**			**76**	82.8
07:45	08:45	47	15	3	0	6	1	2			**74**	79.3
08:00	09:00	53	11	3	0	3	2	2			**74**	75.7
08:15	09:15	57	9	3	0	2	1	2			**74**	75.3
08:30	**09:30**	**61**	**8**	**3**	**0**	**2**	**1**	**1**			**76**	**78.1**
08:45	09:45	50	5	2	0	2	1	1			**61**	62.6
09:00	10:00	36	4	1	0	2	0	1			**44**	45.7
09:15	10:15	14	3	1	0	2	0	1			**21**	22.7
15:00	16:00	110	8	1	0	6	0	8			**133**	133.1
15:15	16:15	109	9	2	0	6	0	9			**135**	134.8
15:30	**16:30**	**119**	**10**	**2**	**0**	**6**	**1**	**11**			**149**	**146.6**
15:45	16:45	111	12	1	0	6	1	8			**139**	138.5
16:00	17:00	116	12	1	0	5	1	7			**142**	141.3
16:15	17:15	116	11	0	0	6	2	8			**143**	141.4
16:30	**17:30**	**100**	**10**	**2**	**0**	**5**	**1**	**6**			**124**	124.6
16:45	17:45	118	10	4	0	5	2	8			**147**	146.4
17:00	18:00	108	6	4	0	6	3	8			**135**	**134.8**
17:15	18:15	80	4	4	0	4	2	6			**100**	100
17:30	**18:30**	**58**	**2**	**2**	**0**	**3**	**2**	**3**			**70**	70.4
17:45	18:45	19	0	0	0	2	1	0			**22**	23.4
	P/TOT	**444**	**48**	**11**	**0**	**27**	**6**	**26**	**0**	**0**	**562**	**570.1**

SITE: **2**
LOCATION: Manor Road / Sainsbury's Access
TOTAL ARMS: A B C

from arm: **all**
to arm: **C**

period I period II
from: 07:30 15:00
to: 09:30 18:00

DATE: 02/10/2018
DAY: Tuesday

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		00:15	00:15	00:15	00:15	00:15	00:15	00:15			00:15	00:15
07:30	**07:45**	13	2	1	0	0	1	0			**17**	16.9
07:45	08:00	4	1	0	0	0	1	0			**6**	5.4
08:00	08:15	11	1	0	0	0	0	0			**12**	12
08:15	08:30	6	1	0	0	0	0	1			**8**	7.2
08:30	**08:45**	13	1	0	0	0	0	0			**14**	14
08:45	09:00	9	2	0	0	0	0	1			**12**	11.2
09:00	09:15	16	3	0	0	0	0	1			**20**	19.2
09:15	09:30	19	0	1	0	0	0	0			**20**	20.5
15:00	15:15	11	1	0	0	0	0	1			**13**	12.2
15:15	15:30	18	1	0	0	0	0	0			**19**	19
15:30	**15:45**	19	2	0	0	0	0	0			**21**	21
15:45	16:00	22	1	0	0	0	0	2			**25**	23.4
16:00	16:15	23	0	0	0	0	2	1			**26**	24
16:15	16:30	13	0	0	0	0	0	0			**13**	13
16:30	**16:45**	27	1	0	0	0	0	0			**28**	28
16:45	17:00	12	0	0	0	0	0	2			**14**	12.4
17:00	17:15	21	1	0	0	0	0	2			**24**	22.4
17:15	17:30	34	3	1	0	0	0	1			**39**	38.7
17:30	**17:45**	27	1	0	0	0	1	2			**31**	28.8
17:45	18:00	15	2	1	0	0	0	1			**19**	18.7
	P/TOT	**333**	**24**	**4**	**0**	**0**	**5**	**15**	**0**	**0**	**381**	**368**
Period I Total:		91	11	2	0	0	2	3	0	0	**109**	106.4
Period II Total:		242	13	2	0	0	3	12	0	0	**272**	261.6

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU.h
PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		01:00	01:00	01:00	01:00	01:00	01:00	01:00			01:00	01:00
07:30	**08:30**	**34**	**5**	**1**	**0**	**0**	**2**	**1**			**43**	41.5
07:45	08:45	34	4	0	0	0	1	1			**40**	38.6
08:00	09:00	39	5	0	0	0	0	2			**46**	44.4
08:15	09:15	44	7	0	0	0	0	3			**54**	51.6
08:30	**09:30**	**57**	**6**	**1**	**0**	**0**	**0**	**2**			**66**	**64.9**
08:45	09:45	44	5	1	0	0	0	2			**52**	50.9
09:00	10:00	35	3	1	0	0	0	1			**40**	39.7
09:15	10:15	19	0	1	0	0	0	0			**20**	20.5
15:00	16:00	70	5	0	0	0	0	3			**78**	75.6
15:15	16:15	82	4	0	0	0	2	3			**91**	87.4
15:30	**16:30**	**77**	**3**	**0**	**0**	**0**	**2**	**3**			**85**	**81.4**
15:45	16:45	85	2	0	0	0	2	3			**92**	88.4
16:00	17:00	75	1	0	0	0	2	3			**81**	77.4
16:15	17:15	73	2	0	0	0	0	4			**79**	75.8
16:30	**17:30**	**94**	**5**	**1**	**0**	**0**	**0**	**5**			**105**	101.5
16:45	17:45	94	5	1	0	0	1	7			**108**	102.3
17:00	18:00	97	7	2	0	0	1	6			**113**	**108.6**
17:15	18:15	76	6	2	0	0	1	4			**89**	86.2
17:30	**18:30**	**42**	**3**	**1**	**0**	**0**	**1**	**3**			**50**	47.5
17:45	18:45	15	2	1	0	0	0	1			**19**	18.7
	P/TOT	**333**	**24**	**4**	**0**	**0**	**5**	**15**	**0**	**0**	**381**	**368**

SITE: **2**
LOCATION: Manor Road / Sainsbury's Access
TOTAL ARMS: A B C

from arm: **all**
to arm: **all**

period I period II
from: 07:30 15:00
to: 09:30 18:00

DATE: 02/10/2018
DAY: Tuesday

from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU		from	to	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL			TOT	PCU.h
PCU factor		1	1	1.5	2.3	2	0.4	0.2						PCU factor		1	1	1.5	2.3	2	0.4	0.2				
INTERVAL		00:15	00:15	00:15	00:15	00:15	00:15	00:15			00:15	00:15		INTERVAL		01:00	01:00	01:00	01:00	01:00	01:00	01:00			01:00	01:00
07:30	**07:45**	123	31	8	0	7	5	4			**178**	182.8	AM	**07:30**	**08:30**	**436**	**93**	**23**	**3**	**16**	**16**	**26**			**613**	614
07:45	08:00	96	23	5	1	5	2	3			**135**	140.2	AM	07:45	08:45	448	83	20	3	9	16	28			**607**	597.9
08:00	08:15	110	19	5	1	2	6	8			**151**	146.8	AM	08:00	09:00	510	84	18	3	5	17	29			**666**	650.5
08:15	08:30	107	20	5	1	2	3	11			**149**	144.2	AM	08:15	09:15	522	79	20	2	3	12	26			**664**	651.6
08:30	**08:45**	135	21	5	0	0	5	6			**172**	166.7	AM	**08:30**	**09:30**	**541**	**77**	**21**	**1**	**6**	**10**	**17**			**673**	**671.2**
08:45	09:00	158	24	3	1	1	3	4			**194**	192.8	AM	08:45	09:45	406	56	16	1	6	5	11			**501**	504.5
09:00	09:15	122	14	7	0	0	1	5			**149**	147.9	AM	09:00	10:00	248	32	13	0	5	2	7			**307**	311.7
09:15	09:30	126	18	6	0	5	1	2			**158**	163.8	AM	09:15	10:15	126	18	6	0	5	1	2			**158**	163.8
15:00	15:15	141	20	4	0	2	4	7			**178**	174	MID	15:00	16:00	529	84	19	3	10	9	23			**677**	676.6
15:15	15:30	111	21	8	1	4	1	5			**151**	155.7	MID	15:15	16:15	526	83	19	4	10	9	19			**670**	674.1
15:30	**15:45**	157	21	4	2	1	3	8			**196**	193.4	MID	**15:30**	**16:30**	**549**	**82**	**13**	**4**	**8**	**12**	**22**			**690**	**684.9**
15:45	16:00	120	22	3	0	3	1	3			**152**	153.5	MID	15:45	16:45	528	82	13	2	9	11	18			**663**	660.1
16:00	16:15	138	19	4	1	2	4	3			**171**	171.5	PM	16:00	17:00	539	82	11	2	8	11	19			**672**	666.3
16:15	16:30	134	20	2	1	2	4	8			**171**	166.5	PM	16:15	17:15	542	88	9	1	10	11	23			**684**	674.8
16:30	**16:45**	136	21	4	0	2	2	4			**169**	168.6	PM	**16:30**	**17:30**	**590**	**94**	**12**	**0**	**9**	**11**	**27**			**743**	729.8
16:45	17:00	131	22	1	0	2	1	4			**161**	159.7	PM	16:45	17:45	624	88	14	0	8	16	33			**783**	762
17:00	17:15	141	25	2	0	4	4	7			**183**	180	PM	17:00	18:00	642	85	14	0	8	19	36			**804**	**778.8**
17:15	17:30	182	26	5	0	1	4	12			**230**	221.5	PM	17:15	18:15	501	60	12	0	4	15	29			**621**	598.8
17:30	**17:45**	170	15	6	0	1	7	10			**209**	200.8	PM	**17:30**	**18:30**	**319**	**34**	**7**	**0**	**3**	**11**	**17**			**391**	377.3
17:45	18:00	149	19	1	0	2	4	7			**182**	176.5	PM	17:45	18:45	149	19	1	0	2	4	7			**182**	176.5
	P/TOT	**2687**	**421**	**88**	**9**	**48**	**65**	**121**	**0**	**0**	**3439**	**3407**			**P/TOT**	**2687**	**421**	**88**	**9**	**48**	**65**	**121**	**0**	**0**	**3439**	**3407**
Period I Total:		977	170	44	4	22	26	43	0	0	**1286**	1285														
Period II Total:		1710	251	44	5	26	39	78	0	0	**2153**	2122														

				from:	to:	
08:30	**09:30**	AM Peak Hour	AM	07:00	10:00	AM Peak PCU **671.2**
15:30	**16:30**	MID Peak Hour	MID	10:00	16:00	MID Peak PCU **684.9**
17:00	**18:00**	PM Peak Hour	PM	16:00	19:00	PM Peak PCU **778.8**
17:00	**18:00**	TOT Peak Hour				TOT Peak PCU **778.8**

APPENDIX B

Parking Stress Survey Data

Manor Road, Richmond

Parking Stress Survey Report

PARKING STRESS SURVEY REPORT

Development: Manor Road, Richmond

Location: London Borough of Richmond

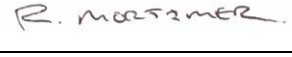
Client: Avanton Richmond Developments Limited

Project Manager: Roger Mortimer

Version No: V01

Date: 26/11/2018

Approvals:

Name	Signature	Title
Roger Mortimer		Project Manager
Penny Winder		Director

CONTENTS PAGE

1 INTRODUCTION

Avanton Richmond Developments Limited has commissioned Alpha Parking Ltd to undertake a parking stress survey around the development site known as Manor Road in Richmond.

The purpose of the survey is to examine the roads within 500 metres' walking distance of the site and establish the existing levels of "parking stress", meaning the percentage of the kerbside parking space occupied at peak periods. This information can be used to assess whether there would be sufficient spare capacity on the streets for any additional parking generated by the development or whether special measures would be needed to manage the pressure for parking space.

Further details of the survey project are given in the inception document shown in Appendix A and a plan of the development site and survey area is shown in Figure 1.

The idea of parking stress surveys arose following changes in government policy in the 1990s to address concerns about growth in car use. In order to limit the available parking spaces the previous requirements to provide parking within housing developments were dropped and, instead, planning authorities were given new powers to cap the number of spaces that developers might choose to provide. However, reducing the levels of parking space did not necessarily stop the new residents from wanting cars. This tended to put pressure on the parking facilities in surrounding roads and, in some cases, for parking demand to exceed the available capacity.

In response to this a number of local authorities, such as the The London Borough of Lambeth, realised the need to assess such problems at the planning stage and the concept of "planning/parking stress surveys" came into being. These allowed early identification of likely problems and meant that protective measures (often in the form of parking restrictions on the streets) could be brought in with, and funded by, the development. The London Borough of Lambeth produced what are recognised as the standard guidelines on how to approach these surveys the “Lambeth Methodology”. This approach is used as the basis for this survey.

2 PROJECT APPROACH

Alpha Parking Ltd recognises that the parking stress survey method developed by Lambeth Council has become an unofficial standard for this type of work and we use this as a basis for our surveys. This standard approach has an added benefit in allowing the results to be readily understood by anyone familiar with previous surveys.

However, we recommend that survey times and technical standards (such as the nominal length of road occupied by a parked vehicle) are tailored to reflect the preferences of the particular local authority involved and we plan the surveys to reflect these requirements.

Every Planning Department will decide on the parking situation on a case by case basis. This means that it is not possible to predict the planning decision, therefore the surveys are providing an independent and professional set of results to facilitate the decision rather than a conclusion. As an indication of the message from the results we would suggest that 85% is an indicative level at which parking stress becomes a cause for concern after allowance has been made for parking generated by the development. At this point, residents will begin to have difficulty parking close to their homes. Anything over 95% represents a situation where full capacity has effectively been reached. The use of a 500 metre walking distance to define the roads affected by the development is accepted as standard practice.

3 METHODOLOGY

Background Assessment

An initial assessment was made taking into account the following factors:-

- The size and nature of the development
- Setting of development – residential/industrial etc, proximity to shopping centres, schools, railway stations etc
- Parking provisions within the development
- Other transport improvements linked to the development.

Surveys

The survey area and the times and days of the surveys were defined taking into account the results of the background assessment. Within each road, the lengths of each section of restricted or unrestricted parking were measured and recorded, together with the number of vehicles parked upon that section and the lengths of any dropped kerbs.The position of skips was also noted, as well as any other unexpected items on the roads.

Analysis

The lengths of restricted and unrestricted parking recorded on site were converted into equivalent numbers of parking spaces, assuming a 5.5 metre length for each space. Any sections with dropped kerbs were excluded from the calculation, as were any lengths of less than 5.5 metres.

4 RESULTS

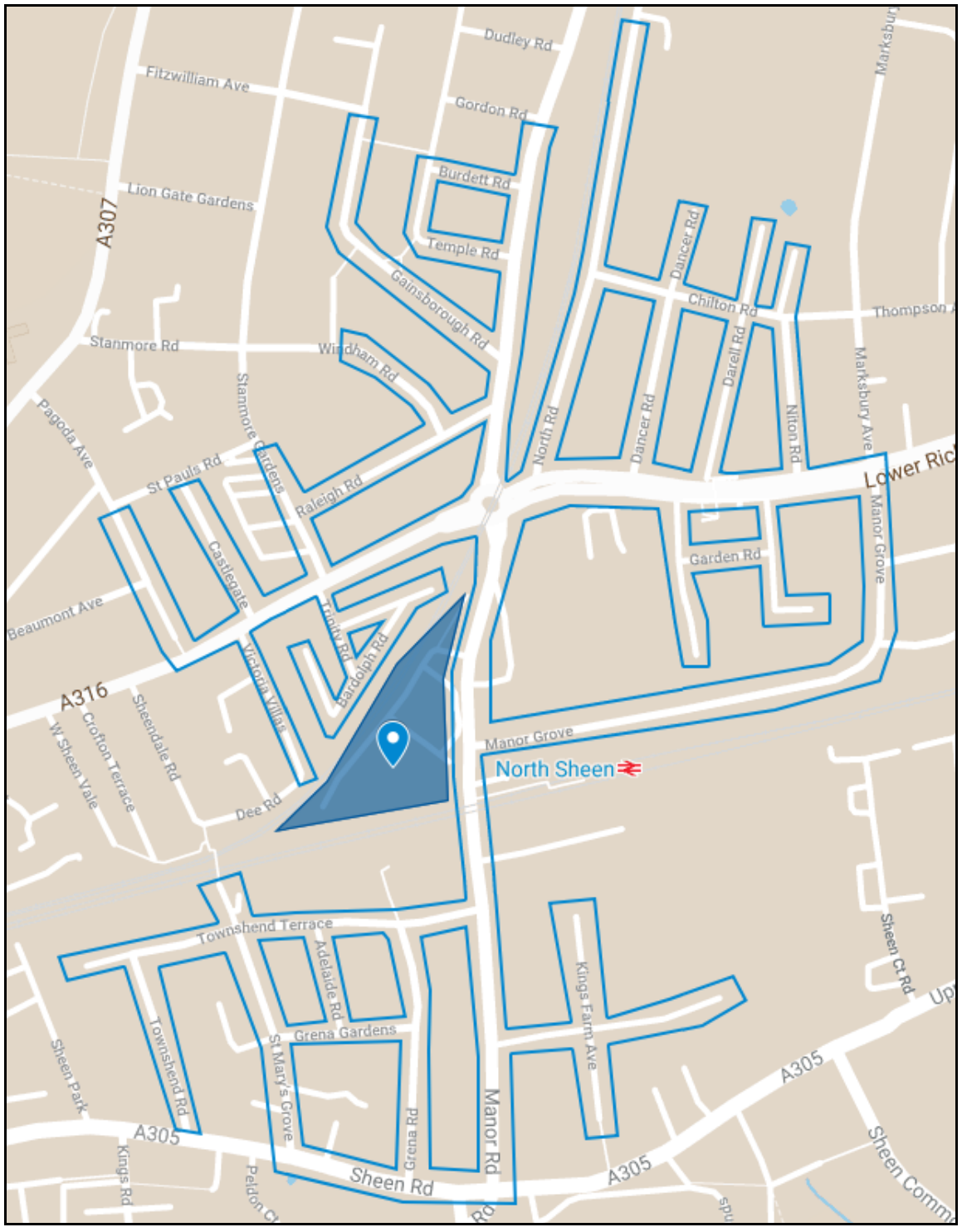
Surveys

The area surveyed is shown on the plan in Figure 1 and the roads surveyed together with any additional comments are listed underneath each table.

The surveys took place between 01:00 – 05:30, 09:00 – 10:00 and 13:00 – 14:00 on Monday 12th and Tuesday 13th November 2018.

The tables show a detailed breakdown of the results for both days and beats and what restrictions are in place on the streets within the survey area.

Figure 1 – Survey Area



- *The shaded area/pin drop shows the site location*

Adelaide Road

			Day 1						Day 2					
Restriction Type	No. Spaces (day)	No. Spaces (night)	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %
Disabled	0	0	1	0.00%	1	0.00%	1	0.00%	1	0.00%	1	0.00%	1	0.00%
Resident Permit Holder	10	10	8	80.00%	9	90.00%	8	80.00%	8	80.00%	8	80.00%	8	80.00%
Resident Permit Holder & Limited Waiting	4	4	3	75.00%	3	75.00%	4	100.00%	4	100.00%	4	100.00%	4	100.00%
Single Yellow/Red Lines	0	15	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Total	**14**	**29**	**12**	**85.71%**	**13**	**92.86%**	**13**	**44.83%**	**13**	**92.86%**	**13**	**92.86%**	**13**	**44.83%**

Bardolph Road

			Day 1						Day 2					
Restriction Type	No. Spaces (day)	No. Spaces (night)	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %
Pay & Display	2	3	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Resident Permit Holders	13	17	10	76.92%	10	76.92%	12	70.59%	10	76.92%	10	76.92%	12	70.59%
Single Yellow/Red Lines	0	2	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Total	**15**	**22**	**10**	**66.67%**	**10**	**66.67%**	**12**	**54.55%**	**10**	**66.67%**	**10**	**66.67%**	**12**	**54.55%**

Burdett Road

			Day 1						Day 2					
Restriction Type	No. Spaces (day)	No. Spaces (night)	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %
Disabled	1	1	1	100.00%	0	0.00%	1	100.00%	1	100.00%	0	0.00%	1	100.00%
Limited Waiting	2	2	2	100.00%	1	50.00%	0	0.00%	2	100.00%	2	100.00%	0	0.00%
Resident Permit Holder	18	18	13	72.22%	14	77.78%	17	94.44%	12	66.67%	14	77.78%	17	94.44%
Total	**21**	**21**	**16**	**76.19%**	**15**	**71.43%**	**18**	**85.71%**	**15**	**71.43%**	**16**	**76.19%**	**18**	**85.71%**

Carrington Road

			Day 1						Day 2					
Restriction Type	No. Spaces (day)	No. Spaces (night)	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %
Disabled	2	2	1	50.00%	1	50.00%	2	100.00%	2	100.00%	2	100.00%	2	100.00%
Unrestricted	48	48	32	66.67%	30	62.50%	40	83.33%	28	58.33%	28	58.33%	41	85.42%
Total	**50**	**50**	**33**	**66.00%**	**31**	**62.00%**	**42**	**84.00%**	**30**	**60.00%**	**30**	**60.00%**	**43**	**86.00%**

Castlegate

			Day 1						Day 2					
Restriction Type	No. Spaces (day)	No. Spaces (night)	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %
Disabled	1	1	0	0.00%	1	100.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Resident Permit Holder	27	27	23	85.19%	22	81.48%	26	96.30%	20	74.07%	21	77.78%	24	88.89%
Resident Permit Holder & Limited Waiting	4	4	4	100.00%	4	100.00%	3	75.00%	4	100.00%	4	100.00%	3	75.00%
Single Yellow/Red Lines	0	13	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Total	**32**	**45**	**27**	**84.38%**	**27**	**84.38%**	**29**	**64.44%**	**24**	**75.00%**	**25**	**78.13%**	**27**	**60.00%**

Chilton Road

			Day 1						Day 2					
Restriction Type	No. Spaces (day)	No. Spaces (night)	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %

Resident Permit Holder	19	19	14	73.68%	14	73.68%	17	89.47%	14	73.68%	13	68.42%	17	89.47%		
Unrestricted	25	25	20	80.00%	19	76.00%	22	88.00%	20	80.00%	20	80.00%	21	84.00%		
Total	**44**	**44**	**34**	**77.27%**	**33**	**75.00%**	**39**	**88.64%**	**34**	**77.27%**	**33**	**75.00%**	**38**	**86.36%**		

Dancer Road

			Day 1						Day 2					
Restriction Type	No. Spaces (day)	No. Spaces (night)	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %
Disabled	1	1	1	100.00%	1	100.00%	1	100.00%	1	100.00%	1	100.00%	1	100.00%
Resident Permit Holder	79	79	53	67.09%	51	64.56%	67	84.81%	50	63.29%	51	64.56%	67	84.81%
Total	**80**	**87**	**54**	**67.50%**	**52**	**65.00%**	**68**	**78.16%**	**51**	**63.75%**	**52**	**65.00%**	**68**	**78.16%**

Darrel Road

			Day 1						Day 2					
Restriction Type	No. Spaces (day)	No. Spaces (night)	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %
Disabled	1	1	0	0.00%	0	0.00%	1	100.00%	0	0.00%	0	0.00%	1	100.00%
School Keep Clear	6	6	1	16.67%	0	0.00%	0	0.00%	2	33.33%	0	0.00%	0	0.00%
Unrestricted	65	65	47	72.31%	49	75.38%	52	80.00%	48	73.85%	48	73.85%	53	81.54%
Total	**72**	**81**	**48**	**66.67%**	**49**	**68.06%**	**53**	**65.43%**	**50**	**69.44%**	**48**	**66.67%**	**54**	**66.67%**

* School Keep Clear restriction applies Monday - Friday between 08.00 to 09.30 and 14.30-16.30

Gainsborough Road

			Day 1						Day 2					
Restriction Type	No. Spaces (day)	No. Spaces (night)	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %
Car Club	1	1	1	100.00%	1	100.00%	1	100.00%	1	100.00%	1	100.00%	1	100.00%
Limited Waiting	2	2	1	50.00%	1	50.00%	0	0.00%	0	0.00%	0	0.00%	1	50.00%
Resident Permit Holder	82	82	55	67.07%	59	71.95%	76	92.68%	51	62.20%	56	68.29%	76	92.68%
Single Yellow/Red Lines	0	4	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Total	**85**	**89**	**57**	**67.06%**	**61**	**71.76%**	**77**	**86.52%**	**52**	**61.18%**	**57**	**67.06%**	**78**	**87.64%**

Garden Road

			Day 1						Day 2					
Restriction Type	No. Spaces (day)	No. Spaces (night)	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %
Unrestricted	19	19	17	89.47%	17	89.47%	14	73.68%	18	94.74%	17	89.47%	14	73.68%
Total	**19**	**19**	**17**	**89.47%**	**17**	**89.47%**	**14**	**73.68%**	**18**	**94.74%**	**17**	**89.47%**	**14**	**73.68%**

Grena Gardens

			Day 1						Day 2					
Restriction Type	No. Spaces (day)	No. Spaces (night)	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %
Disabled	2	2	1	50.00%	1	50.00%	2	100.00%	2	100.00%	1	50.00%	2	100.00%
Resident Permit Holder	16	16	12	75.00%	12	75.00%	13	81.25%	11	68.75%	12	75.00%	13	81.25%
Resident Permit Holder & Limited Waiting	2	2	2	100.00%	2	100.00%	2	100.00%	2	100.00%	2	100.00%	2	100.00%
Single Yellow/Red Line	0	14	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Total	**20**	**34**	**15**	**75.00%**	**15**	**75.00%**	**17**	**50.00%**	**15**	**75.00%**	**15**	**75.00%**	**17**	**50.00%**

Grena Road

			Day 1						Day 2					
Restriction Type	No. Spaces (day)	No. Spaces (night)	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %
Resident Permit Holder	25	25	23	92.00%	22	88.00%	24	96.00%	22	88.00%	21	84.00%	24	96.00%
Resident Permit Holder & Limited Waiting	5	5	2	40.00%	2	40.00%	4	80.00%	3	60.00%	3	60.00%	4	80.00%
Total	**30**	**31**	**25**	**83.33%**	**24**	**80.00%**	**28**	**93.33%**	**25**	**83.33%**	**24**	**80.00%**	**28**	**93.33%**

Kings Farm Avenue

			Day 1						Day 2					
Restriction Type	No. Spaces (day)	No. Spaces (night)	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %
Disabled	3	3	4	133.33%	3	100.00%	4	133.33%	3	100.00%	3	100.00%	4	133.33%
Unrestricted	52	52	38	73.08%	37	71.15%	44	84.62%	38	73.08%	37	71.15%	45	86.54%
Total	**55**	**55**	**42**	**76.36%**	**40**	**72.73%**	**48**	**87.27%**	**41**	**74.55%**	**40**	**72.73%**	**49**	**89.09%**

Lower Mortlake Road

			Day 1						Day 2					
Restriction Type	No. Spaces (day)	No. Spaces (night)	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %
Loading & Disabled	4	4	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Resident Permit Holder	6	6	5	83.33%	5	83.33%	5	83.33%	5	83.33%	5	83.33%	5	83.33%
Resident Permit Holder & Limited Waiting	2	2	4	200.00%	4	200.00%	4	200.00%	4	200.00%	4	200.00%	4	200.00%
Total	**12**	**12**	**9**	**75.00%**	**9**	**75.00%**	**9**	**75.00%**	**9**	**75.00%**	**9**	**75.00%**	**9**	**75.00%**

Lower Richmond Road

			Day 1						Day 2					
Restriction Type	No. Spaces (day)	No. Spaces (night)	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %
Loading	2	2	0	0.00%	0	0.00%	0	0.00%	1	50.00%	0	0.00%	0	0.00%
Limited Waiting	4	4	2	50.00%	1	25.00%	0	0.00%	0	0.00%	1	25.00%	0	0.00%
Single Yellow/Red Lines	0	40	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Total	**6**	**46**	**2**	**33.33%**	**1**	**16.67%**	**0**	**0.00%**	**1**	**16.67%**	**1**	**16.67%**	**0**	**0.00%**

Manor Gardnes

			Day 1						Day 2					
Restriction Type	No. Spaces (day)	No. Spaces (night)	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %
Resident Permit Holder	10	10	8	80.00%	8	80.00%	8	80.00%	8	80.00%	8	80.00%	8	80.00%
Resident Permit Holder & Limited Waiting	10	10	9	90.00%	9	90.00%	9	90.00%	8	80.00%	9	90.00%	8	80.00%
Total	**20**	**23**	**17**	**85.00%**	**17**	**85.00%**	**17**	**85.00%**	**16**	**80.00%**	**17**	**85.00%**	**16**	**80.00%**

Manor Grove

			Day 1						Day 2					
Restriction Type	No. Spaces (day)	No. Spaces (night)	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %
Disabled	2	2	2	100.00%	2	100.00%	2	100.00%	1	50.00%	1	50.00%	2	100.00%
Unrestricted	190	190	116	61.05%	112	58.95%	127	66.84%	113	59.47%	107	56.32%	130	68.42%
Total	**192**	**192**	**118**	**61.46%**	**114**	**59.38%**	**129**	**67.19%**	**114**	**59.38%**	**108**	**56.25%**	**132**	**68.75%**

Manor Park

			Day 1						Day 2					
Restriction Type	No. Spaces (day)	No. Spaces (night)	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %
Disabled	2	2	1	50.00%	1	50.00%	2	100.00%	2	100.00%	2	100.00%	2	100.00%
Unrestricted	22	22	20	90.91%	19	86.36%	21	95.45%	20	90.91%	20	90.91%	21	95.45%
Total	**24**	**24**	**21**	**87.50%**	**20**	**83.33%**	**23**	**95.83%**	**22**	**91.67%**	**22**	**91.67%**	**23**	**95.83%**

Manor Road

			Day 1						Day 2					
Restriction Type	No. Spaces (day)	No. Spaces (night)	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %
Single Yellow/Red Lines	0	15	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Unrestricted	39	39	30	76.92%	29	74.36%	34	87.18%	27	69.23%	27	69.23%	34	87.18%
Total	**39**	**54**	**30**	**76.92%**	**29**	**74.36%**	**34**	**62.96%**	**27**	**69.23%**	**27**	**69.23%**	**34**	**62.96%**

Market Road

			Day 1						Day 2					
Restriction Type	No. Spaces (day)	No. Spaces (night)	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %
Loading & Disabled	2	2	1	50.00%	1	50.00%	0	0.00%	1	50.00%	1	50.00%	0	0.00%
Single Yellow/Red Lines	0	2	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Unrestricted	8	8	6	75.00%	6	75.00%	3	37.50%	8	100.00%	7	87.50%	3	37.50%
Total	**10**	**12**	**7**	**70.00%**	**7**	**70.00%**	**3**	**25.00%**	**9**	**0.00%**	**8**	**80.00%**	**3**	**25.00%**

Niton Road

			Day 1						Day 2					
Restriction Type	No. Spaces (day)	No. Spaces (night)	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %
School Keep Clear	4	4	0	0.00%	0	0.00%	1	25.00%	0	0.00%	0	0.00%	1	25.00%
Unrestricted	31	31	21	67.74%	21	67.74%	22	70.97%	21	67.74%	19	61.29%	25	80.65%
Total	**35**	**35**	**21**	**60.00%**	**21**	**60.00%**	**23**	**65.71%**	**21**	**60.00%**	**19**	**54.29%**	**26**	**74.29%**

* School Keep Clear restriction applies Monday - Friday between 08.00 to 09.30 and 14.30-16.30

North Road

			Day 1						Day 2					
Restriction Type	No. Spaces (day)	No. Spaces (night)	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %
Limited Waiting	3	3	2	66.67%	2	66.67%	3	100.00%	1	33.33%	3	100.00%	2	66.67%
Resident Permit Holder	108	108	67	62.04%	74	68.52%	95	87.96%	66	61.11%	71	65.74%	89	82.41%
Single Yellow/Red Lines	0	3	1	33.33%	0	0.00%	0	0.00%	0	0.00%	1	33.33%	0	0.00%
Total	**111**	**114**	**70**	**63.06%**	**76**	**68.47%**	**98**	**85.96%**	**67**	**60.36%**	**75**	**67.57%**	**91**	**79.82%**

Orchard Road

			Day 1						Day 2					
Restriction Type	No. Spaces (day)	No. Spaces (night)	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %
Limited Waiting & Disabled	4	4	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Unrestricted	26	26	23	88.46%	23	88.46%	9	34.62%	25	96.15%	23	88.46%	8	30.77%

Total	**30**	**30**	**23**	**76.67%**	**23**	**76.67%**	**9**	**30.00%**	**25**	**83.33%**	**23**	**76.67%**	**8**	**26.67%**

Pagoda Avenue

			Day 1						Day 2					
Restriction Type	No. Spaces (day)	No. Spaces (night)	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %
Resident Permit Holder	28	28	24	85.71%	23	82.14%	25	89.29%	22	78.57%	22	78.57%	26	92.86%
Resident Permit Holder & Limited Waiting	4	4	5	125.00%	5	125.00%	7	175.00%	5	125.00%	6	150.00%	7	175.00%
Total	**32**	**32**	**29**	**90.63%**	**28**	**87.50%**	**32**	**100.00%**	**27**	**84.38%**	**28**	**87.50%**	**33**	**103.13%**

Raleigh Road

			Day 1						Day 2					
Restriction Type	No. Spaces	No. Spaces	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %
Resident Permit Holder	64	64	63	98.44%	60	93.75%	68	106.25%	61	95.31%	61	95.31%	68	106.25%
Total	**64**	**64**	**63**	**98.44%**	**60**	**93.75%**	**68**	**106.25%**	**61**	**95.31%**	**61**	**95.31%**	**68**	**106.25%**

Sandycombe Road

			Day 1						Day 2					
Restriction Type	No. Spaces (day)	No. Spaces (night)	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %
Single Yellow/Red Lines	0	13	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Unrestricted	41	41	36	87.80%	33	80.49%	39	95.12%	36	87.80%	36	87.80%	39	95.12%
Total	**41**	**54**	**36**	**87.80%**	**33**	**80.49%**	**39**	**72.22%**	**36**	**87.80%**	**36**	**87.80%**	**39**	**72.22%**

Sheen Road

			Day 1						Day 2					
Restriction Type	No. Spaces (day)	No. Spaces (night)	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %
Resident Permit Holder	19	19	15	78.95%	14	73.68%	15	78.95%	15	78.95%	14	73.68%	15	78.95%
Resident Permit Holder & Limited Waiting	10	10	7	70.00%	7	70.00%	7	70.00%	8	80.00%	6	60.00%	7	70.00%
Single Yellow/Red Lines	0	12	0	0.00%	1	>100.00%	0	0.00%	0	0.00%	2	>100.00%	0	0.00%
Total	**29**	**41**	**22**	**75.86%**	**22**	**75.86%**	**22**	**53.66%**	**23**	**79.31%**	**22**	**75.86%**	**22**	**53.66%**

St George's Road

			Day 1						Day 2					
Restriction Type	No. Spaces (day)	No. Spaces (night)	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %
Resident Permit Holder	26	26	15	57.69%	14	53.85%	14	53.85%	16	61.54%	14	53.85%	14	53.85%
Total	**26**	**26**	**15**	**57.69%**	**14**	**53.85%**	**14**	**53.85%**	**16**	**61.54%**	**14**	**53.85%**	**14**	**53.85%**

St Mary's Grove

			Day 1						Day 2					
Restriction Type	No. Spaces (day)	No. Spaces (night)	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %
Resident Permit Holder	25	25	17	68.00%	17	68.00%	19	76.00%	17	68.00%	16	64.00%	18	72.00%
Resident Permit Holder & Limited Waiting	9	9	5	55.56%	4	44.44%	6	66.67%	6	66.67%	5	55.56%	5	55.56%
Total	**34**	**34**	**22**	**64.71%**	**21**	**61.76%**	**25**	**73.53%**	**23**	**67.65%**	**21**	**61.76%**	**23**	**67.65%**

Stanmore Grove

			Day 1						Day 2					
Restriction Type	No. Spaces (day)	No. Spaces (night)	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %
Resident Permit Holder	15	15	12	80.00%	13	86.67%	16	106.67%	12	80.00%	12	80.00%	15	100.00%
Resident Permit Holder & Pay at Machine	13	13	11	84.62%	11	84.62%	11	84.62%	10	76.92%	10	76.92%	11	84.62%
Single Yellow/Red Lines	0	1	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Total	**28**	**29**	**23**	**82.14%**	**24**	**85.71%**	**27**	**93.10%**	**22**	**0.00%**	**22**	**78.57%**	**26**	**89.66%**

Temple Road

			Day 1						Day 2					
Restriction Type	No. Spaces (day)	No. Spaces (night)	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %
Disabled	1	1	1	100.00%	1	100.00%	1	100.00%	1	100.00%	1	100.00%	1	100.00%
Limited Waiting	2	2	2	100.00%	2	100.00%	1	50.00%	0	0.00%	0	0.00%	1	50.00%
Resident Permit Holder	36	36	19	52.78%	19	52.78%	32	88.89%	21	58.33%	22	61.11%	31	86.11%
Total	**39**	**39**	**22**	**56.41%**	**22**	**56.41%**	**34**	**87.18%**	**22**	**56.41%**	**23**	**58.97%**	**33**	**84.62%**

Townshed Road

			Day 1						Day 2					
Restriction Type	No. Spaces (day)	No. Spaces (night])	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %
Resident Permit Holder	31	31	23	74.19%	23	74.19%	29	93.55%	25	80.65%	26	83.87%	28	90.32%
Single Yellow/Red Lines	0	14	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Total	**31**	**45**	**23**	**74.19%**	**23**	**74.19%**	**29**	**64.44%**	**25**	**80.65%**	**26**	**83.87%**	**28**	**62.22%**

Townshed Terrace

			Day 1						Day 2					
Restriction Type	No. Spaces (day)	No. Spaces (night)	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %
Disabled	1	1	1	100.00%	1	100.00%	1	100.00%	1	100.00%	1	100.00%	1	100.00%
Resident Permit Holder	40	40	30	75.00%	29	72.50%	28	70.00%	30	75.00%	28	70.00%	31	77.50%
Single Yellow/Red Lines	0	41	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	1	2.44%
Total	**41**	**82**	**31**	**75.61%**	**30**	**73.17%**	**29**	**35.37%**	**31**	**0.00%**	**29**	**70.73%**	**33**	**40.24%**

Trinity Cottages

			Day 1						Day 2					
Restriction Type	No. Spaces (day)	No. Spaces (night)	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %
Resident Permit Holder	1	1	0	0.00%	0	0.00%	1	100.00%	1	100.00%	1	100.00%	1	100.00%
Total	**1**	**1**	**0**	**0.00%**	**0**	**0.00%**	**1**	**100.00%**	**1**	**100.00%**	**1**	**100.00%**	**1**	**100.00%**

Trinity Road

			Day 1						Day 2					
Restriction Type	No. Spaces (day)	No. Spaces (night)	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %
Resident Permit Holder	19	19	8	42.11%	9	47.37%	14	73.68%	9	47.37%	7	36.84%	15	78.95%
Total	**19**	**19**	**8**	**42.11%**	**9**	**47.37%**	**14**	**73.68%**	**9**	**47.37%**	**7**	**36.84%**	**15**	**78.95%**

Victoria Villas

			Day 1						Day 2					
Restriction Type	No. Spaces (day)	No. Spaces (night)	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %
Loading & Disabled	2	2	1	50.00%	1	50.00%	0	0.00%	0	0.00%	1	50.00%	0	0.00%
Resident Permit Holder	11	11	3	27.27%	3	27.27%	2	18.18%	3	27.27%	4	36.36%	2	18.18%
Resident Permit Holder & Pay at Machine	12	12	5	41.67%	4	33.33%	2	16.67%	3	25.00%	3	25.00%	2	16.67%
Single Yellow/Red Lines	0	3	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Total	**25**	**28**	**9**	**36.00%**	**8**	**32.00%**	**4**	**14.29%**	**6**	**24.00%**	**8**	**32.00%**	**4**	**14.29%**

Windham Road

			Day 1						Day 2					
Restriction Type	No. Spaces (day)	No. Spaces (night)	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %	0900-1000	Stress %	1300-1400	Stress %	Overnight	Stress %
Resident Permit Holder	11	11	7	63.64%	9	81.82%	9	81.82%	10	90.91%	9	81.82%	9	81.82%
Resident Permit Holder & Limited Waiting	13	13	10	76.92%	10	76.92%	11	84.62%	9	69.23%	11	84.62%	10	76.92%
School Keep Clear	3	3	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Single Yellow/Red Lines	0	4	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Total	**27**	**31**	**17**	**62.96%**	**19**	**70.37%**	**20**	**64.52%**	**19**	**70.37%**	**20**	**74.07%**	**19**	**61.29%**

* School Keep Clear restriction applies Monday - Friday between 08.00 to 09.30 and 14.30-16.30

Overall Results

Overall Results	Spaces	Usage	Average Stress	Average Stress per beat/day	Overall Average Stress
Day 1 - 0900-1000	1453	1028	70.75%	70.13%	67.45%
Day 2 - 0900-1000		1010	69.51%		
Day 1 - 1300-1400	1628	1017	62.47%	62.93%	
Day 2 - 1300-1400		1032	63.39%		
Day 1 - overnight	1674	1161	69.35%	69.30%	
Day 2 - overnight		1159	69.24%		

CONCLUSION

The overall stress percentage covering the survey area is 67.45%. While the parking decisions for developments remains with the Council the results here are moderate for a busy London Borough.

Appendix A

A. CONTACT DETAILS

1. Client Contact Name	Avanton Richmond Developments Limited
2. Client Contact Email address	chris@avanton.co.uk

B. DEVELOPMENT DETAILS

3. Development Name	Manor Road, Richmond
4. Development address (please include post code)	84 Manor Road, Richmond, TW9 1YB
5. Can development plans be provided?	n/a

PLANNING REQUIREMENTS

6. Which Local Authority is requiring the Parking Stress Survey?	London Borough of Richmond
7. Local Authority Planning contact:	n/a

ALPHA PARKING

Manor Road, Richmond: PSS Day 1 AM

SCALE	1 : 1250 @ A0 size
DATE	26/11/2018
DRAWING No.	
DRAWN BY	

ALPHA PARKING

Manor Road, Richmond: PSS Day 1 Night

SCALE	1 : 1250 at A0 size
DATE	26/11/2018
DRAWING No.	
DRAWN BY	

ALPHA PARKING

Manor Road, Richmond: PSS Day 1 PM

SCALE	1 : 1250 @ A0 size
DATE	26/11/2018
DRAWING No.	
DRAWN BY	