

PROPOSED MIXED-USE DEVELOPMENT, WHALLEY TRANSPORT ASSESSMENT ADDENDUM NOTE REV A

VN91274 – TA Addendum Note Rev A

Introduction

1. Vectos have been commissioned by Maple Grove Developments to provide transport and highways advice to support a hybrid planning application for a mixed-use development at land between the A59 and Clitheroe Road in Whalley (Application Ref 3/2019/0545). The site lies within the jurisdiction of Ribble Valley Borough Council (RVBC) as Local Planning Authority and Lancashire County Council (LCC) as Local Highway Authority.
2. A Transport Assessment (TA) dated July 2019 was prepared by Vectos and submitted alongside the planning application. The TA addressed the highways and transport implications of the proposed development. The TA concluded that proposed development would not have an unacceptable impact upon highway safety and that the residual cumulative impacts of the proposed development would not be severe.
3. The TA also presented the proposed access arrangements to serve the site, comprising a new fourth arm of the A59 / A671 roundabout to serve the proposed commercial land uses and a new access onto Clitheroe Road to serve the proposed residential land uses.
4. Comments (dated 7th January 2020) on the TA were provided by Lancashire County Council (LCC) Highways Development Control Officer, Neil Stevens, and these are provided at **Appendix A** to this Note. Subsequently, Vectos met with Neil Stevens on the 19th February 2020 at the RVBC offices in Clitheroe to discuss the comments, and further dialogue has taken place over the course of 2020, with further information provided to LCC Highways through a TA Addendum Note in July, to which comments were provided by LCC Highways in October 2020. This revised TA Addendum Note therefore responds to all the comments received from LCC Highways to date.
5. This TA Addendum Note has been prepared to demonstrate how all the LCC Highways comments to date have been addressed and covers the following areas:
 - Revised A59 / A671 roundabout access arrangement drawing and Road Safety Audit of the proposed fourth arm
 - Commentary upon the potential future operation of the elements of the site subject to outline application, in terms of highway operation
 - Commentary upon proposed parking provision for the employment element of the development
 - Further detail on the public right of way (PRoW) strategy
 - Revised Clitheroe Road access arrangement and revised bin store location on the proposed residential road
 - Detail of the sustainable access to the drive-thru from Clitheroe Road during phase 1
 - Trip rate and trip generation information
 - Trip distribution information
 - Future year traffic forecasts

- Revised junction assessments including further commentary of the modelling approach
6. In addition, the Residential Travel Plan for the proposed residential development has been updated to include detail on the proposed funding of measures, and the updated Travel Plan is submitted alongside this Addendum Note.
7. An updated site masterplan drawing has been prepared and this is shown at **Appendix B** to this Note. A plan showing the full and outline components of the hybrid planning application is also provided at **Appendix B**. The proposed site plan indicates that the proposed internal roads within the site are not intended to be adopted and would therefore not be maintainable at the expense of the Local Highway Authority.

Proposed Vehicular Access to Commercial Area – A59 / A671 Roundabout

8. The proposed fourth arm access to the commercial land uses within the site has been amended following dialogue with LCC Highways and a stage 1 Road Safety Audit (RSA), the findings of which are presented in the report at **Appendix C** to this Note. Vectos have responded to the RSA as detailed in the RSA Response Report at **Appendix D** to this Note. The updated design, taking account of the RSA comments and the LCC Highways comments is shown in **Vectos Drawing VN40390-SK001 H**. The key changes to the design compared to that submitted as part of the original TA are as follows:
- An amendment to the alignment of the A59 northbound approach arm to help reduce speeds on approach and widening of the approach lanes.
 - An increase in the radius of the site access arm to assist a smooth exit from the roundabout.
 - Widening of the proposed site access arm to better accommodate HGV movements.
 - Widening of the south-west circulatory to provide two circulatory lanes.
 - Amended road marking on A671 approach nearside lane to ahead and right arrow.
 - Provision of dropped kerbs and tactile paving to assist pedestrian crossing of the site access arm.
9. The roundabout design checklist is shown in **Vectos Drawing VN40390-SK001/GEO H**. This shows that the roundabout as proposed is compliant with all mandatory standards as defined in the Design Manual for Roads and Bridges (DMRB) document CD116 'Geometric Design of Roundabouts'.
10. This includes the A671 and A59 southbound approach arms, which are not proposed to be changed as part of this scheme. When the checklist information is considered alongside the accident record at the roundabout, as presented in the original TA, it is clear that there is no evidence to suggest that the existing layout of the roundabout is unsafe, and therefore no justification for making any physical changes to these arms in conjunction with the proposed development.
11. A full set of swept path drawings for the proposed amendments is also provided within the drawing pack at the end of this Note. This includes a swept path drawing showing that in the unlikely event of multiple cars being queued in the right turn lane to access the drive-thru, an HGV can still proceed safely along the access road.
12. The proposed general arrangement drawing also shows the proposed integration of the Public Right of Way (Footpath 11) at the roundabout. The current PRoW alignment is shown in Figure 1 which is an extract from the Mario online mapping database.

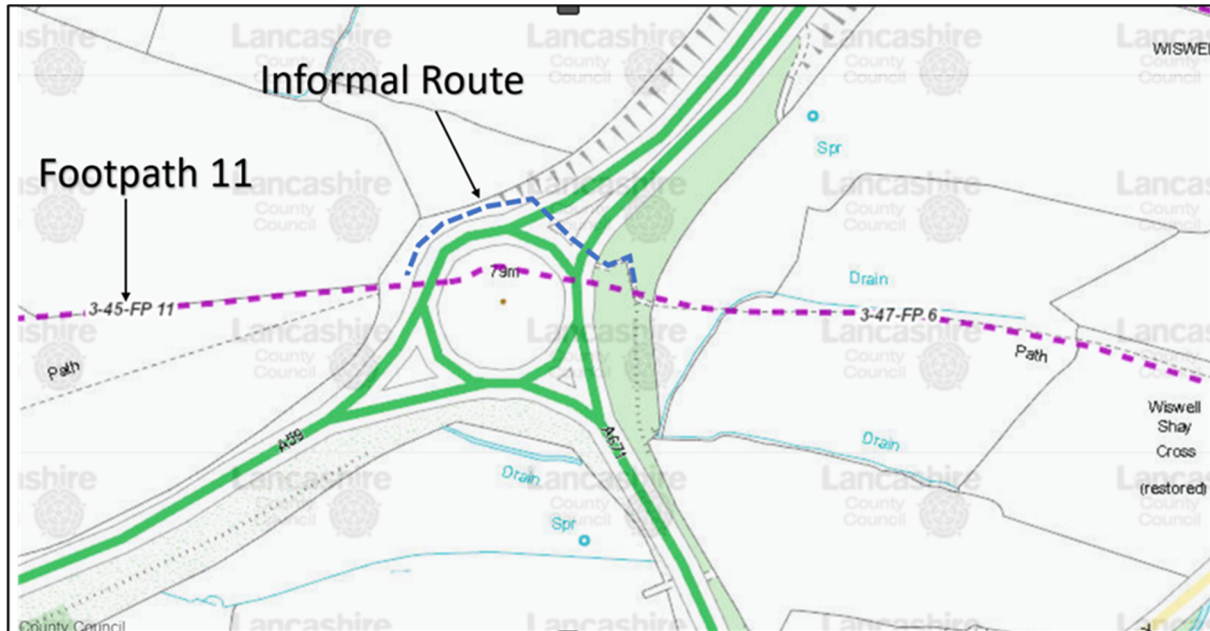


Figure 1. PRoW and Informal Route at the Roundabout

13. The purple dashed line in **Figure 1** shows the existing PRoW alignment, whilst the blue dashed line has been added to show the informal route that appears to be used on the ground to negotiate this part of the network and which appears to have been formally surfaced in parts. The proposed access arm will provide footway on the northern side that will tie into this informal route, and a dropped kerb crossing with tactile paving will be provided across the access arm to facilitate pedestrian movements to link the southern side where the connection will be provided to Footpath 11, which will be diverted within the site.
14. The proposed development is not expected to result in a significant increase in pedestrian movements using the PRoW to and from the east, and this route is only used infrequently by leisure walkers. Notwithstanding, it is proposed to upgrade the section of informal path between the site boundary and the A59, and the short section in the verge on the opposite side of the A59, to provide a 2m path of paved material (bitmac or bound gravel/rural finish) and edged to retain structural integrity.
15. As shown in the plan at **Appendix B**, the extent of the full application includes the proposed fourth arm access road up to and including the drive-thru access. Beyond this point, the commercial component of the scheme is subject to the outline element of the application. Nonetheless, the illustrative masterplan shows the potential formation of the remainder of the commercial development and how these could be accessed.
16. The proposed employment element of the scheme is subject to the outline application however some consideration has been given to the parking provision for this element and a total of 76 spaces are shown on the illustrative masterplan to serve the employment units. This equates to provision at a rate of 1 space per 40 sq.m which is in line with the parking standard for business parks as set out in the Joint Lancashire Structure Plan. This is considered a robust provision, and results in a greater level of parking provision than would be delivered through applying the standard for B2 general industrial or B8 storage and distribution (1 per 45 sq.m and 200 sq.m respectively). This provision is therefore

considered appropriate to mitigate any concerns regarding potential overspill parking from the employment development.

17. Consideration has been given to the operational aspects of the PFS in highway terms, and the following commentary is provided:
- The proposed fourth arm access road can accommodate fuel tanker movements and at times of fuel deliveries, cars could still be allowed to enter the PFS but be immediately directed to the exit using cones or similar. This ensures traffic would not stop on the access road and seek to turn around with a reverse manoeuvre. A swept path assessment showing a fuel tanker vehicle accessing and exiting the PFS is shown in **Drawing VN40390-SK001/SPA-4** and **Drawing VN40390-SK001/SPA-5**.
 - Vehicles accessing the PFS from the west would be few in number however this manoeuvre can be undertaken safely, and without causing undue delay to other movements on the access road.
 - Vehicle movements between the PFS and the drive-thru involve a slightly staggered manoeuvre and visibility is good in all directions to ensure that drivers are able to safely assess the road environment before undertaking the manoeuvre.
 - Should the PFS provide HGV refuelling facility, the access is of sufficient standard to accommodate this.
18. In relation to the drive-thru delivery arrangements, we understand that Costa deliveries occur outside of peak times, and will make use of space within the car park temporarily whilst loading/unloading. This limits the impact of deliveries upon the operation of the car park.

Proposed Access onto Clitheroe Road

19. This proposed access has been amended to reflect discussions with LCC Highways, with the changes shown in **Vectos Drawing VN91274-D101 B** and **VN91274-D102 B** and summarised as follows:
- Internal side roads relocated to be further from Clitheroe Road.
 - Proposed footway along Clitheroe Road shown.
 - Pedestrian refuge crossing on Clitheroe Road added to assist pedestrian movement between the site and Whalley to the south.
 - Bin stores relocated further into the site and main access road widened to better accommodate passing manoeuvre of a refuse vehicle and car (see **Vectos Drawing VN91274-TR103 A** for swept path analysis).

Internal Layout: Residential

20. The developer does not intend for the proposed internal roads within the site to be adopted by the Local Highway Authority and this is stated explicitly on the masterplan at **Appendix B**. Notwithstanding, the information submitted as part of the original TA included swept path assessments for the internal residential roads and care home that demonstrated suitable turning facilities for refuse vehicles.
21. Furthermore, a drawing showing visibility splays at the internal junctions within the residential development is provided as **Vectos Drawing VN91274-D103**.

Link Road Considerations

22. LCC Highways have asked for an explanation as to why the scheme is not proposing to deliver a link road through the site to allow vehicular connections between Clitheroe Road and the A59 / A671 roundabout. It is understood that such a link is not a requirement in policy terms and there is no obligation on the developer to deliver a link of this nature as part of the development. Notwithstanding, a link road through the site would inevitably induce high traffic flows through the site, which would be inappropriate particularly given the proposed residential and care home elements of the scheme on the eastern part of the site.

Phased Sustainable Access to Drive Thru

23. Prior to the outline elements of the scheme being delivered, access on foot and cycle between Clitheroe Road and the drive-thru will be provided via a temporary path. The route of the path is indicated by the pink dashed line on the masterplan drawing at **Appendix B**, following the footway which is part of the full application. This indicates that the path will be a minimum of 3.5m in width therefore would be a suitable width for shared pedestrian and cyclist use, with hard surfacing and timber edging.
24. The developer is happy to give a commitment to providing the link. Its route can follow the footpath which is part of the full application and details of which can be finalised by a condition to be imposed on the full part of the hybrid permission. It is suggested that the path provision, route and details through the outline development zone can be made a requirement of the first application for the approval of reserved matters by a condition to be imposed on the outline part of the hybrid permission.

Trip Generation

25. Whilst the proposed residential and care home trip rates were accepted by LCC Highways, the employment, PFS and drive-thru trip rates were queried. These have been revisited by Vectos, as follows.

Drive-thru Trip Forecasts

26. The drive-thru forms a detailed part of the application and is intended to be constructed as a coffee-shop drive-thru, with discussions having taken place with Costa as the potential occupier. The proposed trip rates presented in the TA were not supported by LCC Highways as they were considered too low. Vectos have reviewed the drive-thru trip rates using the latest version of TRICS and there is now a drive-thru coffee shop site in the TRICS database that was surveyed in October 2019. The trip rate for this site has been reviewed and the rates are notably higher than those derived using the older version of TRICS which did not include specific coffee shop drive-thru facilities.
27. The TRICS report is provided at **Appendix E** to this Note. It is therefore proposed to use these trip rates, which are presented in **Table 1**, along with the previous trip rates proposed, to enable comparison.

Table 1: Previous and Proposed Trip Rates and Trip Forecasts – Drive-thru

		TA		Proposed Revision	
		Arr	Dep	Arr	Dep
Trip Rate	AM	3.218	3.678	8.810	8.333
	PM	7.111	6.963	8.453	9.881
Trip Generation (170 sqm)	AM	5	6	15	14
	PM	12	12	14	17

28. It can be seen from **Table 1** that the revised trip rates vary from those within the TA most notably in the AM peak, resulting in a more than doubling of the trip forecasts. Whilst the revised TRICS forecast is based upon one site, which is the only one in the database, the fact that it is a coffee shop drive-thru (Starbucks) and is located off a main A-road (the A46 in Warwick) is considered to match the proposed drive-thru characteristics better than the food drive-thru sites used for the previous TRICS assessment.
29. It should also be noted that these revised trip rates are higher than those used in support of the drive-thru facilities at the Barrow Brook development to the north of the site, which is now operational and provides separate Starbucks and KFC drive-thru facilities. The application for those drive-thru facilities was made in 2016 (planning reference 3/2016/0848) and the supporting TA was undertaken by Idom Merebrook Ltd. Vectos has reviewed the trip rates presented in the Idom Merebrook Ltd TA and these are reproduced in **Table 2**.

Table 2: Barrow Brook Drive-Thru Trip Rates from Idom Merebrook Ltd TA 2016

	Idom Merebrook TA (Barrow Brook Development)	
	Arr	Dep
AM	7.535	8.221
PM	6.427	8.261

30. It can be seen from **Table 2** that the trip rates used in support of the drive-thru facilities to the north of the proposed site are lower than the proposed revised trip rates set out in **Table 1**. This provides further comfort that these proposed revised trip rates are suitable for use in this assessment.

PFS Trip Forecasts

31. The proposed PFS trip rates presented in the TA were not supported by LCC Highways as they were considered too low. LCC Highways suggested that the Co-Op PFS with retail located at the Barrow Brook development to the north of the site could be used as a suitable proxy for the proposed PFS with retail development. A survey has therefore been undertaken at this Co-Op PFS with retail on Tuesday 3rd March 2020, to record the peak hour arrivals and departures. The raw survey data is provided at **Appendix F** to this Note. The Co-Op PFS provides 8 filling bays, which is the same as shown on the illustrative masterplan for the proposed site.

32. The trip rates derived from the survey are provided in **Table 3**, along with the TA trip rates and generations for comparison.

Table 3: Previous and Proposed Trip Rates and Trip Forecasts – PFS

		TA		Proposed Revision based on Co-Op Survey	
		Arr	Dep	Arr	Dep
Trip Rate	AM	8.838	8.622	8.625	9.25
	PM	9.352	9.372	13.75	14.375
Trip Generation (8 bays)	AM	71	69	69	74
	PM	75	75	110	115

33. It can be seen from **Table 3** that the TRICS data aligns closely with the surveyed Co-Op PFS data in the morning peak, and also aligns with the LCC Highways Officer’s observations, however in the evening peak, the surveyed trips were notably higher. Whilst the morning peak hour trips generated by TRICS are very closely aligned with the Co-Op PFS survey data, Vectos propose to utilise the Co-Op survey data to inform the morning and evening peak hour trip rates, to reflect this bespoke local data.

Employment Trip Forecasts

34. The employment element of the application is being made in outline, with no fixed configuration of the proposed units, enabling flexibility to suit eventual occupiers. Whilst smaller units are shown in the illustrative masterplan, it is possible that larger units could be provided within the parameters of the planning permission sought.
35. The proposed employment area is split into two zones – a north and south zone, with 1,690 sqm GIA floor space on the northern zone and 2,055 sqm GIA on the southern zone. This totals 3,745 sqm GIA of flexible / inter-changeable Class B1 and/or Class B2 and/or Class B8 land use. It is noted however that the planning statement in support of the application identifies the employment element as responding to demand for small to medium sized industrial units, which would best be reflected by B2 land use.
36. The TRICS assessment in the Vectos TA was based upon entirely B1 and B2 sites, which are generally accepted as more intensive trip generating land uses than B8, therefore by omitting B8 sites, the trip rates were inherently biased towards the higher end. Notwithstanding, it is acknowledged that some of the unit sizes within the TRICS sample were larger than might be expected at the proposed development, therefore a revised TRICS assessment has been undertaken to reduce the average size of unit, but still omitting any B8 land uses, so still ensuring a robust assessment.
37. The revised employment TRICS data is provided at **Appendix G** to this Note, with a summary of the trip forecasts provided in **Table 4**.

Table 4: Previous and Proposed Trip Rates and Trip Forecasts – Employment

		TA		Proposed Revision	
		Arr	Dep	Arr	Dep
Trip Rate	AM	0.242	0.062	0.361	0.125
	PM	0.066	0.225	0.098	0.472
Trip Generation (8 bays)	AM	9	2	14	5
	PM	2	8	4	18

38. It can be seen from **Table 4** that the revised employment trip forecasts are higher than those that were proposed in the TA, and it is proposed that these higher rates are incorporated into the assessment, to reflect the comments from LCC Highways.

Proposed Commercial Land Use Revised Trip Totals

39. Combining the revised trip forecasts for each of the proposed commercial land uses results in the trips shown in **Table 5**.

Table 5: Total Trip Forecasts: Commercial Land Uses, A59 Access

	AM			PM		
	Arr	Dep	Two-way	Arr	Dep	Two-way
Employment	14	5	19	4	18	22
PFS	69	74	143	110	115	225
Drive-thru	15	14	29	14	17	31
Total	98	93	191	128	150	278

Trip Types

40. The trips at the A59 access will not all be new to the local highway network, and this is acknowledged in the LCC Highways comments. The TA set out the different trip types that could be expected to comprise the overall trip generation, these being pass-by trips and cross-visitation trips, in addition to ‘new’ trips. The TA took a very robust approach in assuming that only 50% of peak hour trips generated by the PFS and drive-thru elements would be pass-by. Further to the comments and dialogue with LCC Highways, it is proposed that this proportion is increased to 85%, such that 85% of the drive-thru and PFS trips are perceptible only as a change in turning movement at the point of site access, with the remaining 15% being ‘new’ trips to the network during the peak hours.

41. A discount to account for cross visitation trips is also appropriate to apply for the proposed PFS and drive-thru land uses as there will inevitably be an element of visitors who visit more than one of the proposed facilities in their trip. To represent this, it is assumed that 5% of the trips to the PFS would also visit the drive-thru and therefore a 5% discount has been applied to the PFS trips to account for this.

Trip Distribution

- 42. The residential trip distribution has been revised to reflect that of the Barrow Lands development, as recommended by LCC Highways. This is summarised in **Figure 1** and **Figure 2** (see **Appendix I**).
- 43. For the commercial trips, further information was requested by LCC Highways regarding the derivation of the proposed distribution for these, and this is expanded upon below.
- 44. As outlined within the Transport Assessment, the trip distribution of future employees has been calculated using 2011 Journey to Work (JTW) Census data and Routefinder software in MapInfo Pro 15.0. This assessment considered where people lived who travelled to the Ribble Valley 007 MSOA for work.
- 45. The base MSOA locations and their route assignment is shown in **Plan 1. Appendix H** provides a breakdown of the MSOA locations, the number of people working within the Ribble Valley 007 and the route they would take to access the employment land uses located off the A59/A671 junction. This assessment has focused on trips arriving at/departing from the site along the A59 and trips travelling south along the A671.

Future Year Assessment

- 46. A future assessment year of 5-years post-planning application is considered acceptable (2024). The developer has confirmed that this is a reasonable timeframe for the completion of the development.
- 47. The future baseline traffic has been established via the application of growth factors derived from the TEMPro database. As detailed in the TA, the alternative assumptions function in TEMPro has been adopted and housing growth zeroed, to reflect the committed residential development already accounted for in the committed development flows.
- 48. LCC Highways have suggested that separate factors should be generated for the strategic roads (A59 and A671) and the local roads. Vectos have therefore applied the National Trip End Model (NTM) adjustments for principal roads and minor roads, to apply to the strategic roads and local roads respectively. The resulting growth factors are shown in **Table 6**, along with the growth factors from the TA, to enable comparison.

Table 6. Revised Growth Factors

	AM	PM	Sat
TA	1.01805	1.0177	1.02165
Revised NTM Principal Rd	1.0300	1.0297	1.0337
Revised NTM Minor Rd	1.0290	1.0286	1.0326

- 49. It can be seen from **Table 6** that the revised growth factors are higher than those proposed in the TA and also account for the different road types being considered. These revised growth factors have been used in the revised assessment.

Committed Development

50. With regards to committed development flows, the LCC Highways comments welcome the approach taken in the TA, only suggesting that the distribution of flows from the Standen Estates development could be amended to put more traffic onto Whalley Road. This has been revisited by Vectos, however the distribution of traffic detailed in the Standen Estates development does not assign any of the development traffic to Whalley Road, and therefore Vectos' analysis is consistent with the information presented in the Standen TA, which is assumed to have been approved by LCC Highways at the time.

Revised Flows

51. A set of flows with revisions to reflect the amended trip rates, trip composition and background growth assumptions set out in this Note are provided at **Appendix I**.

Revised Capacity Assessment

52. Junction capacity assessments were provided within the Transport Assessment for the following junctions;
- A59/A671 priority roundabout junction; and
 - Clitheroe Road/Proposed Site Access Priority controlled junction.
53. The capacity assessments for these junctions have been updated to reflect the revised set of flows provided at **Appendix I**. A summary of modelling results is provided below.

A59/A671 Roundabout

54. The roundabout has been modelled using JUNCTIONS software which is the industry-standard modelling tool for roundabouts and priority junctions. It is noted that the current arrangement of the A59 north-east bound approach is atypical in that it does not provide give-way markings for the nearside lane (straight ahead movement). This situation cannot be represented accurately in the JUNCTIONS software, and the modelling therefore assumes that drivers do slow down to give way here. This ensures a robust assessment of the roundabout capacity for the future year 'Without Development' scenarios.
55. The model presented in the TA incorporated the junction geometries which were used in support of the Barrow Lands proposals (Ref. 3/2012/0630). Following a further review however, some of these geometries have been revised.
56. **Table 7** provides a summary of the 2024 Baseline 'Without Development' modelling results. The full modelling outputs for the baseline scenarios are provided in **Appendix J**.

Table 7: A59/A617 2024 Baseline ‘Without Development’ JUNCTIONS Results

Arm	AM Peak Revised Flows		PM Peak Revised Flows	
	Queue	RFC	Queue	RFC
A59 North	6	0.86	7	0.89
A671	4	0.79	2	0.69
A59 South	4	0.82	3	0.75

57. **Table 7** highlights that the roundabout is forecast to operate with modest queues in both the morning and evening peak hour, with queues no greater than 6 PCUs. These revised results for the future baseline situation are very similar to those presented in the TA.

Limitations of JUNCTIONS Modelling

58. Whilst the JUNCTIONS software provides a forecast of junction performance based upon geometric parameters and traffic flows, it does not necessarily represent queueing based upon lane usage with complete accuracy, and it is appropriate to apply engineering judgement when interpreting results. In this case, it is known that the A671 approach arm does experience queueing in the morning peak hour, which at times would typically exceed the level of queue forecast in the results for the baseline situation. In this regard, it is instructive to refer to indications of queue length from Google Traffic, and Image 1 shows the typical traffic speed information generated by Google Traffic for a Thursday morning at 08:15.

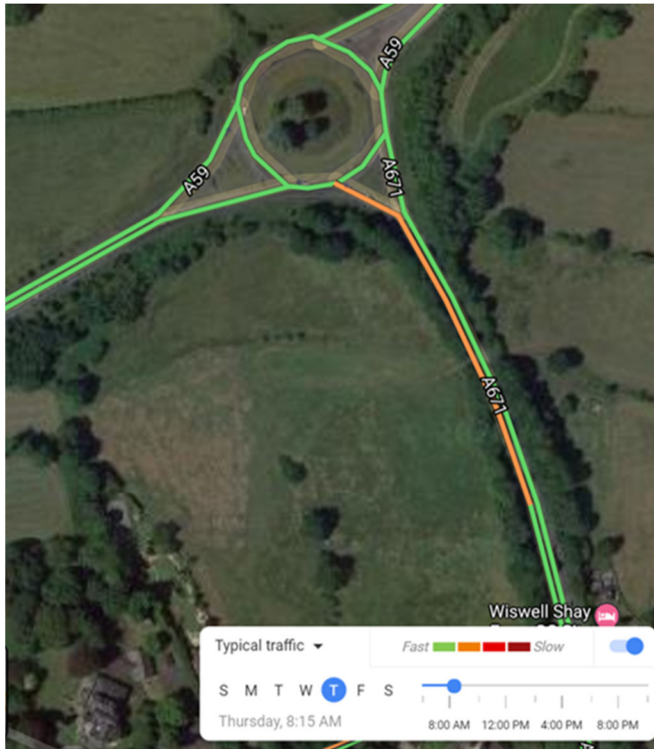


Image 1: Google Traffic Typical Traffic Conditions A59/A671 Roundabout Weekday Morning Peak 08:15

59. The Google Traffic illustration indicates slower moving traffic on the A671 approach for a distance of around 200m upstream of the junction. This suggests that a slow moving queue on the approach to the junction can form at times during the peak. At other times during the peak, the queue virtually disappears, as indicated in Image 2, which represents the situation at 08:40.

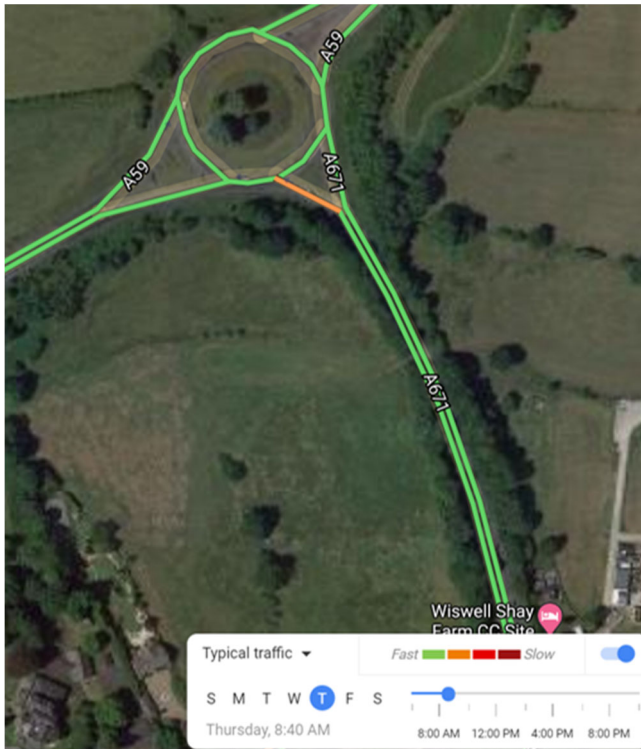


Image 2: Google Traffic Typical Traffic Conditions A59/A671 Roundabout Weekday Morning Peak 08:40

- 60. The Google Traffic information therefore suggests that the JUNCTIONS model does not represent the A671 worst case queueing situation with complete accuracy, however it is noted from the Google data that the queue does tend to dissipate within the peak hour and there will be inherent daily variation in the queueing situation that cannot be fully replicated in the model.
- 61. **Table 8** provides a summary of the 2024 Baseline ‘With Development’ modelling results based upon the revised flows and geometries with full outputs at **Appendix K**.

Table 8: A59/A617 2024 Baseline ‘With Development’ JUNCTIONS Results

Arm	AM Peak Revised Flows		PM Peak Revised Flows	
	Queue	RFC	Queue	RFC
A59 North	7	0.88	9	0.91
A671	4	0.81	3	0.72
A59 South	2	0.59	1	0.55
Site Access	0	0.09	0	0.13

62. The results in **Table 8** suggest that the proposed development will have a modest effect upon the operation of the roundabout. The A59 North arm experiences a small increase in queues of up to 2 PCUs in the evening peak hour, and the A671 arm is forecast to experience an increased ratio of flow to capacity, however this does not result in a change in the queue situation on this approach compared to the without development situation. The traffic flow figures at **Appendix I** show that the increase in trips on this arm as a result of development would be just 17 additional trips in the morning peak hour. This small change in flows helps to explain the small change in performance at this arm.
63. The A59 south arm is shown to experience a slight improvement in performance, with a reduction in queues on this approach when compared to the without development situation. This can be attributed to the proposed widening of the approach lanes on this arm.
64. **Table 8** therefore highlights that the roundabout will operate satisfactorily with the proposed fourth arm and development traffic. The site access arm is expected to operate without queuing and the with queues expected to increase by a maximum of 2 PCUs on any other arm, the impact of the development upon the operation of the junction is certainly not considered to be severe.
65. **Sensitivity Test: 30% B1 Office**
66. Whilst the proposed employment element of the outline application is intended to accommodate small to medium sized industrial units, the land use being applied for includes B1 in addition to B2 and B8, and at the request of LCC Highways, a sensitivity test has been undertaken in trip generation terms, which assumes that 30% of the proposed employment floor space is B1 office. B1 office typically generates higher trips than B2 and B8 uses.
67. Trip rates for a potential office use at the site have been derived from the TRICS (7.7.3) database, using the following search criteria:
- Land Use: Employment, Office
 - Greater London and Republic of Ireland site excluded
 - GFA range: 1,000-4,000 sq.m
 - Suburban areas only
 - Date range: 01/01/12 – 14/03/19
68. The resulting TRICS report is provided at **Appendix L** to this Note with a summary of peak hour trip rates and trip forecasts for 30% of the employment floor space (1,124 sqm) shown in **Table 9**.

Table 9: B1 Sensitivity Test Trip Rates

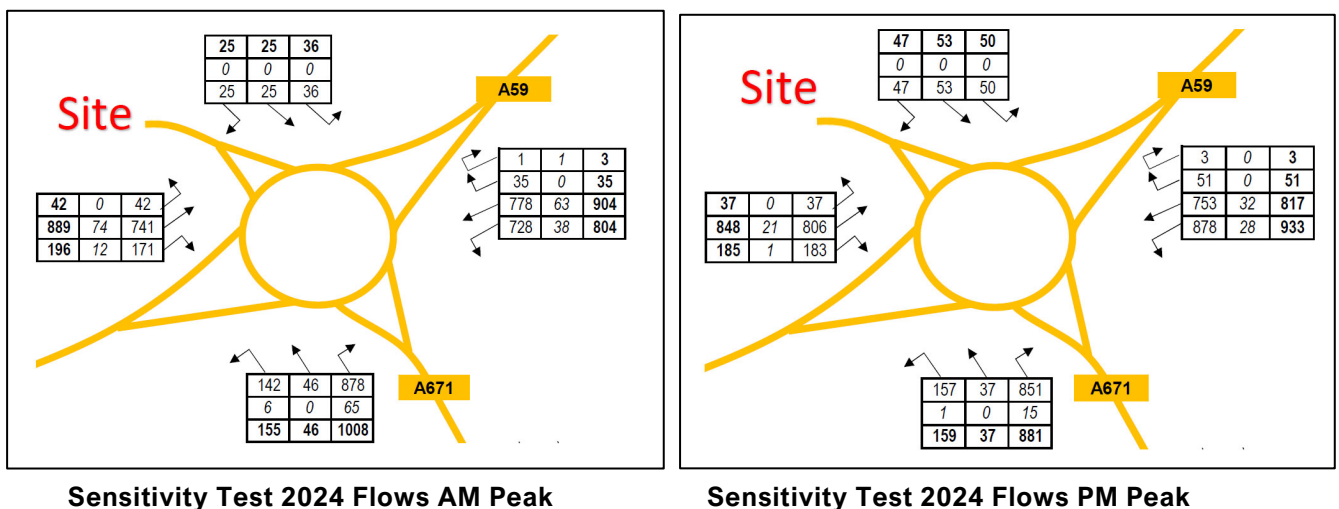
		TA	
		Arr	Dep
Trip Rate	AM	2.886	0.205
	PM	0.432	1.853
Trip Generation (1,124 sqm)	AM	32	2
	PM	5	21

69. The remaining 70% of the employment space is subject to the trip rates identified in **Table 4**. The sensitivity test scenario employment trip generation total is therefore outlined in **Table 10**.

Table 10: Sensitivity Test: Employment Trip Totals

	AM			PM		
	Arr	Dep	Two-way	Arr	Dep	Two-way
Employment B2 (70%)	9	3	12	3	12	15
Employment B1 (30%)	32	2	34	5	21	26
Total	41	5	46	8	33	41

70. Comparing these totals to the employment trip totals forecast in **Table 5**, it can be seen that the sensitivity test results in an additional 19 two-way vehicle trips in the morning peak hour and 22 in the evening peak hour. To demonstrate that this scenario could also be accommodated, the roundabout model has been assessed using the sensitivity test development flows. The flows are shown below.



71. The results of the JUNCTIONS modelling using these sensitivity flows are shown in **Table 11** with full outputs at **Appendix K**.

Table 11: Sensitivity Test Employment Trip Totals

Arm	AM Peak		PM Peak	
	Queue	RFC	Queue	RFC
A59 North	7	0.87	10	0.91
A671	5	0.82	3	0.72
A59 South	2	0.60	1	0.55
Site Access	0	0.09	0	0.14

72. It can be seen from **Table 11** that the sensitivity test scenario would not be forecast to result in any material change to the performance of the junction as compared to the non-sensitivity scenario presented in **Table 8**, with queue length increasing by just one PCU on the A59 North in the PM, and once PCU on the A671 in the AM, but otherwise unchanged.

Clitheroe Road/Site Access Junction

73. **Table 12** provides a summary of the 2024 Baseline ‘With Development’ modelling results for the Clitheroe Road/Site Access junction. The full modelling outputs are provided in **Appendix M**.

Table 12: Clitheroe Road/ Site Access 2024 Baseline ‘With Development’ JUNCTIONS Results

Arm	AM Peak Revised Flows		PM Peak Revised Flows	
	Queue	RFC	Queue	RFC
Site Access	0	0.06	0	0.03
Clitheroe Road Right Turn	0	0.02	0	0.03

74. **Table 12** highlights that the proposed Clitheroe Road site access is forecast to operate without queueing.

Off-Site Junction Assessment

75. The effect of the proposed development traffic at junctions further afield has also been considered through a percentage impact analysis for the Clitheroe Road / Wiswell Lane junction and Wiswell Lane / A671 / Wiswell Shay junction. This is presented in **Table 13**.

Table 13: Off-Site Junction Percentage Impact Analysis

Arm	AM Peak			PM Peak		
	2024 Base	2024 Base + Dev	% change	2024 Base	2024 Base + Dev	% change
Wiswell Lane / A671 / Wiswell Shay	2,193	2,233	1.8%	2,344	2,387	1.8%
Wiswell Lane / Clitheroe Road	995	1,019	2.4%	1,002	1,024	2.2%

- 76. It can be seen from **Table 13** that the off-site junctions are forecast to experience negligible changes in peak hour traffic flow, amounting to a 1.8% change at the Wiswell Lane / Wiswell Shay / A671 junction, and up to 2.4% change at the Wiswell Lane Clitheroe Road junction. These small changes in flow are not considered to represent a material change in the operation of the junctions.
- 77. For example, at the Wiswell Lane / Clitheroe Road junction, the change in traffic flows in the morning peak total just 24 vehicles, which averages at an additional vehicle every 2 to 3 minutes during this hour which would not be expected to cause any material changes to the experience of those using the junction. The change in traffic is forecast to be even lower in the evening peak.
- 78. Similarly, at the Wiswell Lane / Wiswell Shay / A671 junction, the change in traffic in the morning peak totals 40 vehicles, which is less than one vehicle per minute during this hour. Whilst the junction does experience some delay in the peak hours, as indicated in Image 3, this additional level of traffic would not be expected to cause any material changes to the experience of those using the junction. The change in traffic is forecast to be even lower in the evening peak.

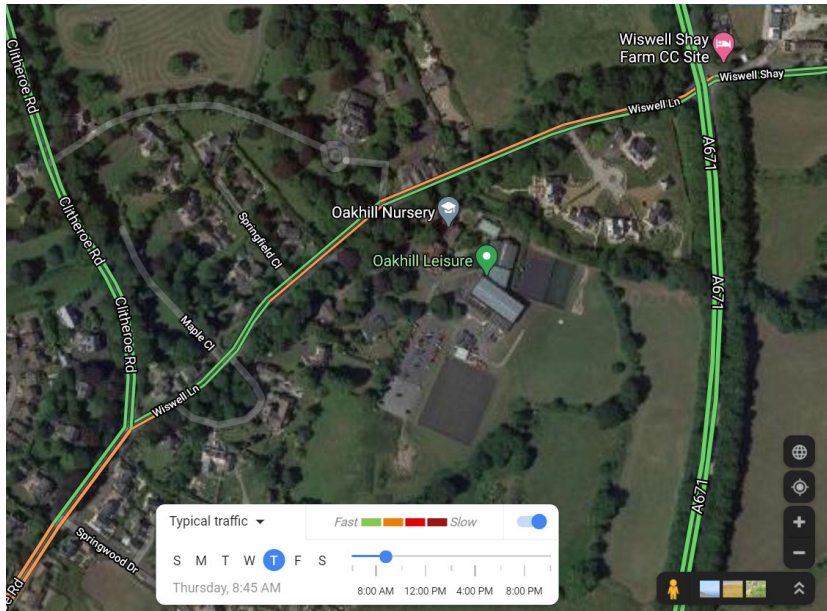


Image 3: Morning Peak Google Traffic: Wider Network

79. The LCC comments suggest that a Grampian type condition should be applied to the proposed development to prevent commencement of the development until the delivery of the Lawsonsteads Link Road, which is not in the Council's control to deliver. The traffic impact analysis that has been presented in the TA and this Addendum Note has demonstrated that such a condition is not necessary and such a condition would not be acceptable to Maple Grove Developments.

Summary

80. This TA Addendum Note has presented revised information following comments from LCC Highways. The proposed access arrangements have been amended to reflect the comments, along with the trip forecast information. The effects of these changes have been considered through an updated junction assessment exercise which demonstrates that the proposed development will be suitably accommodated on the local highway network.

Plans

Plan 1 MSOA Postcode Locations and Route Assignment

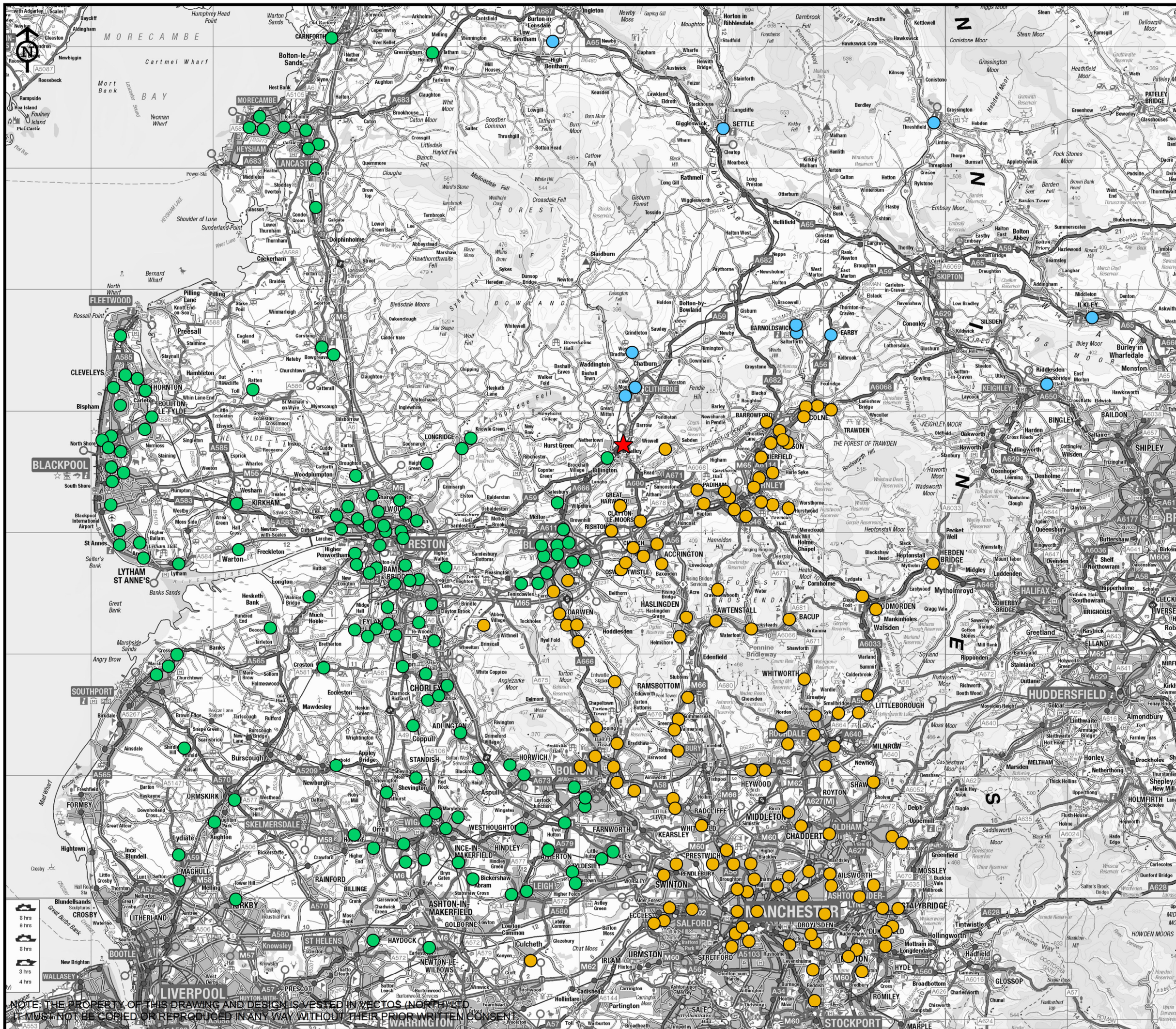
Drawings

Drawing VN40390-SK001 H	Proposed Access Design
Drawing VN40390-SK001 GEO 2	Roundabout Design Checklist
Drawing VN40390-SK001/SPA-1 D	Swept Path Analysis Max Artic
Drawing VN40390-SK001/SPA-2 D	Swept Path Analysis Max Artic
Drawing VN40390-SK001/SPA-3 D	Swept Path Analysis Max Artic
Drawing VN40390-SK001/SPA-4	Swept Path Analysis Oil Tanker
Drawing VN40390-SK001/SPA-5	Swept Path Analysis Oil Tanker
Drawing VN40390-SK001/SPA-6	Swept Path Analysis Max Artic
Drawing VN91274-D101 B	Proposed Pedestrian Refuge Clitheroe Road
Drawing VN91274-D102 B	Proposed Access Arrangement Clitheroe Road
Drawing VN91274-TR103 A	Swept Path Analysis Refuse Vehicle and Large Car
Drawing VN91274-D103	Visibility Splays Internal Junctions

Appendices

Appendix A	LCC Highways Comments
Appendix B	Proposed Masterplan and Hybrid Application Plan
Appendix C	RSA
Appendix D	RSA Response Report
Appendix E	TRICS Report - Drive-thru
Appendix F	Traffic Survey Data
Appendix G	TRICS Report – Employment
Appendix H	Distribution Information
Appendix I	Revised Traffic Flow Figures
Appendix J	Modelling Output A59 / A671 Without Development
Appendix K	Modelling Outputs A59 / A671 / Proposed Access With Development
Appendix L	TRICS Report Sensitivity Test B1 Office
Appendix M	Modelling Outputs Clitheroe Road Access

Plans



- Legend**
- ★ Site_Location
 - A671 South
 - A59 North
 - A59 West

This is not a construction drawing and is intended for illustrative purposes only.

Contains Ordnance Survey data © Crown copyright and database right 2017.

CLIENT:
Maple Grove Developments

PROJECT TITLE:
Land at Whalley, Clitheroe

DRAWING TITLE:
**Employment MSOA
Locations and Distribution
Assignment**

SCALE:
N.T.S

DRAWN: TA	CHECKED: TR	DATE: Mar 2020
-----------	-------------	----------------

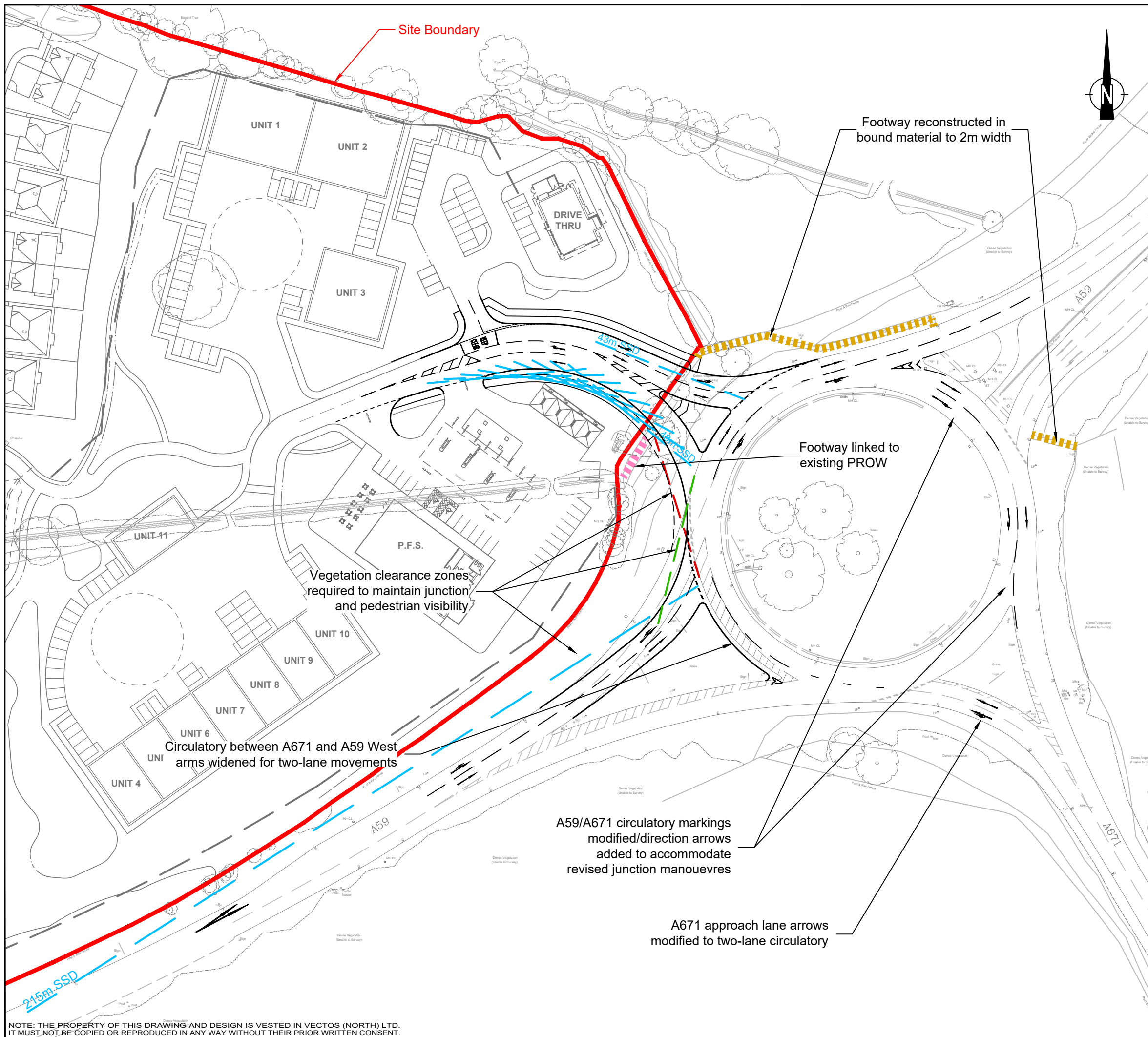


Oxford Place, 61 Oxford Street, Manchester M1 6EQ
t:0161 228 1008 e:manchester@vectos.co.uk

DRAWING NO: VN91274-G104	REVISION:
------------------------------------	-----------

NOTE: THE PROPERTY OF THIS DRAWING AND DESIGN IS VESTED IN VECTOS (NORTH) LTD. IT MUST NOT BE COPIED OR REPRODUCED IN ANY WAY WITHOUT THEIR PRIOR WRITTEN CONSENT.

Drawings



Notes:
1.
2.

H	West circulatory widened to 2 lanes	dlb	TR	18.11.20
G	Various changes to LCC 10/20 comments	dlb	TR	9.11.20
F	RSA1 changes, items 5.1 & 5.2	dlb	TR	22.07.20
E	Site access entry lane widened	dlb	TR	19.06.20
D	Various amendments to review comments	dlb	TR	27.05.20
C	A59 entry and Dev access realigned	dlb	RW	24.02.20
B	Amended to suit new master plan layout	JD	RW	6.06.19
A	Lane removed from exit carriageway	JD	RW	6.12.17

REV.	DETAILS	DRAWN	CHECKED	DATE
------	---------	-------	---------	------

CLIENT:
Maple Grove Developments

PROJECT:
Whalley Clitheroe

DRAWING TITLE:
Proposed 4th Arm off A59/A671 Roundabout

SCALES:
1:1000 at A3

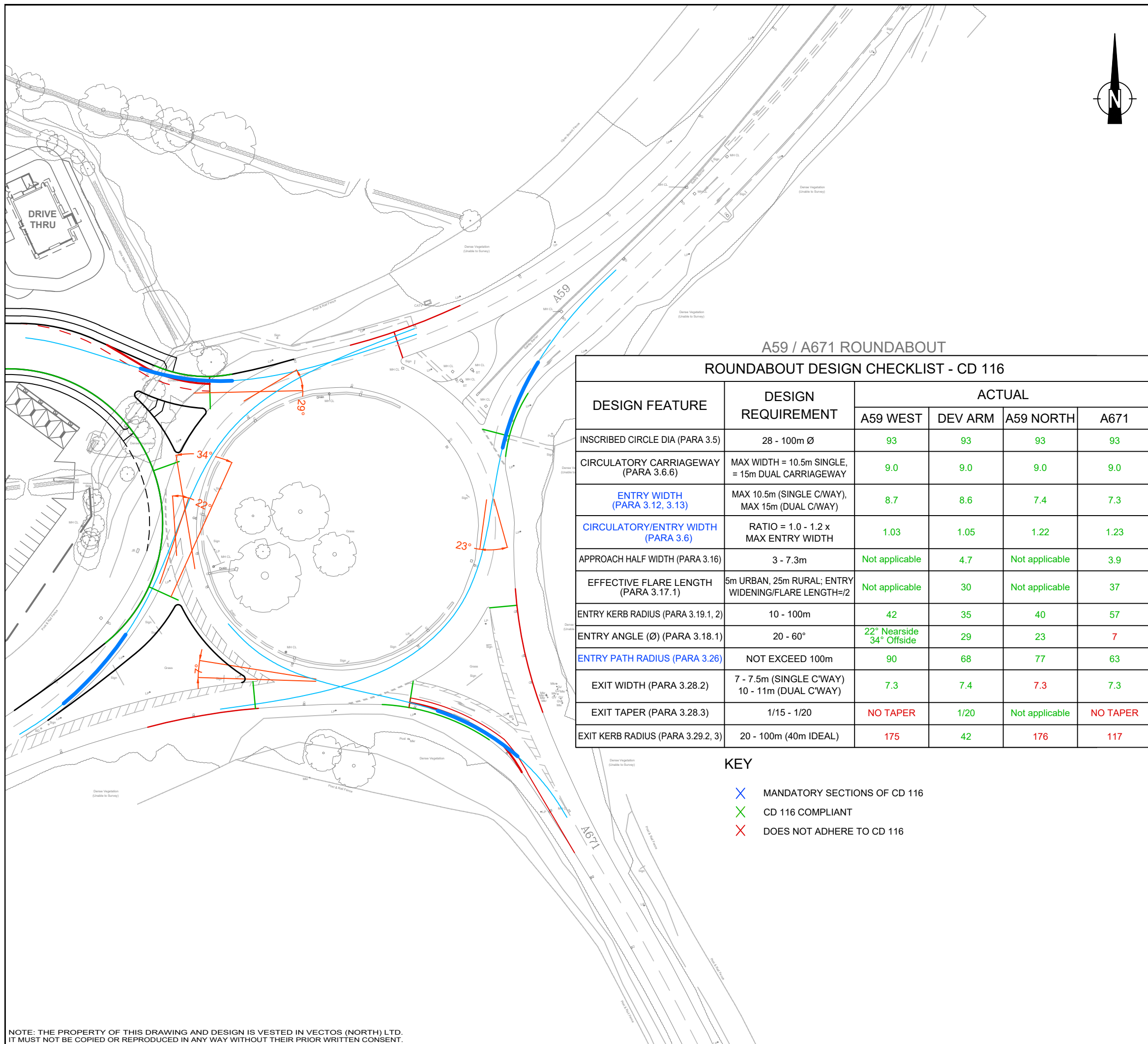
DRAWN:	AH	CHECKED:	RW	DATE:	14.10.14
--------	----	----------	----	-------	----------



Oxford Place, 61 Oxford Street, Manchester M1 6EQ
t: 0161 228 1008 e: manchester@vectos.co.uk

DRAWING NUMBER:	VN40390-SK001	REVISION:	H
-----------------	----------------------	-----------	----------

NOTE: THE PROPERTY OF THIS DRAWING AND DESIGN IS VESTED IN VECTOS (NORTH) LTD. IT MUST NOT BE COPIED OR REPRODUCED IN ANY WAY WITHOUT THEIR PRIOR WRITTEN CONSENT.



A59 / A671 ROUNDABOUT

ROUNDABOUT DESIGN CHECKLIST - CD 116

DESIGN FEATURE	DESIGN REQUIREMENT	ACTUAL			
		A59 WEST	DEV ARM	A59 NORTH	A671
INSCRIBED CIRCLE DIA (PARA 3.5)	28 - 100m Ø	93	93	93	93
CIRCULATORY CARRIAGEWAY (PARA 3.6.6)	MAX WIDTH = 10.5m SINGLE, = 15m DUAL CARRIAGEWAY	9.0	9.0	9.0	9.0
ENTRY WIDTH (PARA 3.12, 3.13)	MAX 10.5m (SINGLE C'WAY), MAX 15m (DUAL C'WAY)	8.7	8.6	7.4	7.3
CIRCULATORY/ENTRY WIDTH (PARA 3.6)	RATIO = 1.0 - 1.2 x MAX ENTRY WIDTH	1.03	1.05	1.22	1.23
APPROACH HALF WIDTH (PARA 3.16)	3 - 7.3m	Not applicable	4.7	Not applicable	3.9
EFFECTIVE FLARE LENGTH (PARA 3.17.1)	5m URBAN, 25m RURAL; ENTRY WIDENING/FLARE LENGTH=1/2	Not applicable	30	Not applicable	37
ENTRY KERB RADIUS (PARA 3.19.1, 2)	10 - 100m	42	35	40	57
ENTRY ANGLE (Ø) (PARA 3.18.1)	20 - 60°	22° Nearside 34° Offside	29	23	7
ENTRY PATH RADIUS (PARA 3.26)	NOT EXCEED 100m	90	68	77	63
EXIT WIDTH (PARA 3.28.2)	7 - 7.5m (SINGLE C'WAY) 10 - 11m (DUAL C'WAY)	7.3	7.4	7.3	7.3
EXIT TAPER (PARA 3.28.3)	1/15 - 1/20	NO TAPER	1/20	Not applicable	NO TAPER
EXIT KERB RADIUS (PARA 3.29.2, 3)	20 - 100m (40m IDEAL)	175	42	176	117

KEY

- X MANDATORY SECTIONS OF CD 116
- X CD 116 COMPLIANT
- X DOES NOT ADHERE TO CD 116

Notes:

- 1.
- 2.

REV.	DETAILS	DRAWN	CHECKED	DATE
A				

CLIENT:
Maple Grove Developments

PROJECT:
Whalley Clitheroe

DRAWING TITLE:
**Proposed 4th Arm off
A59/A671 Roundabout
Whole Junction Geometric Check**

SCALES:
1:1000 at A3

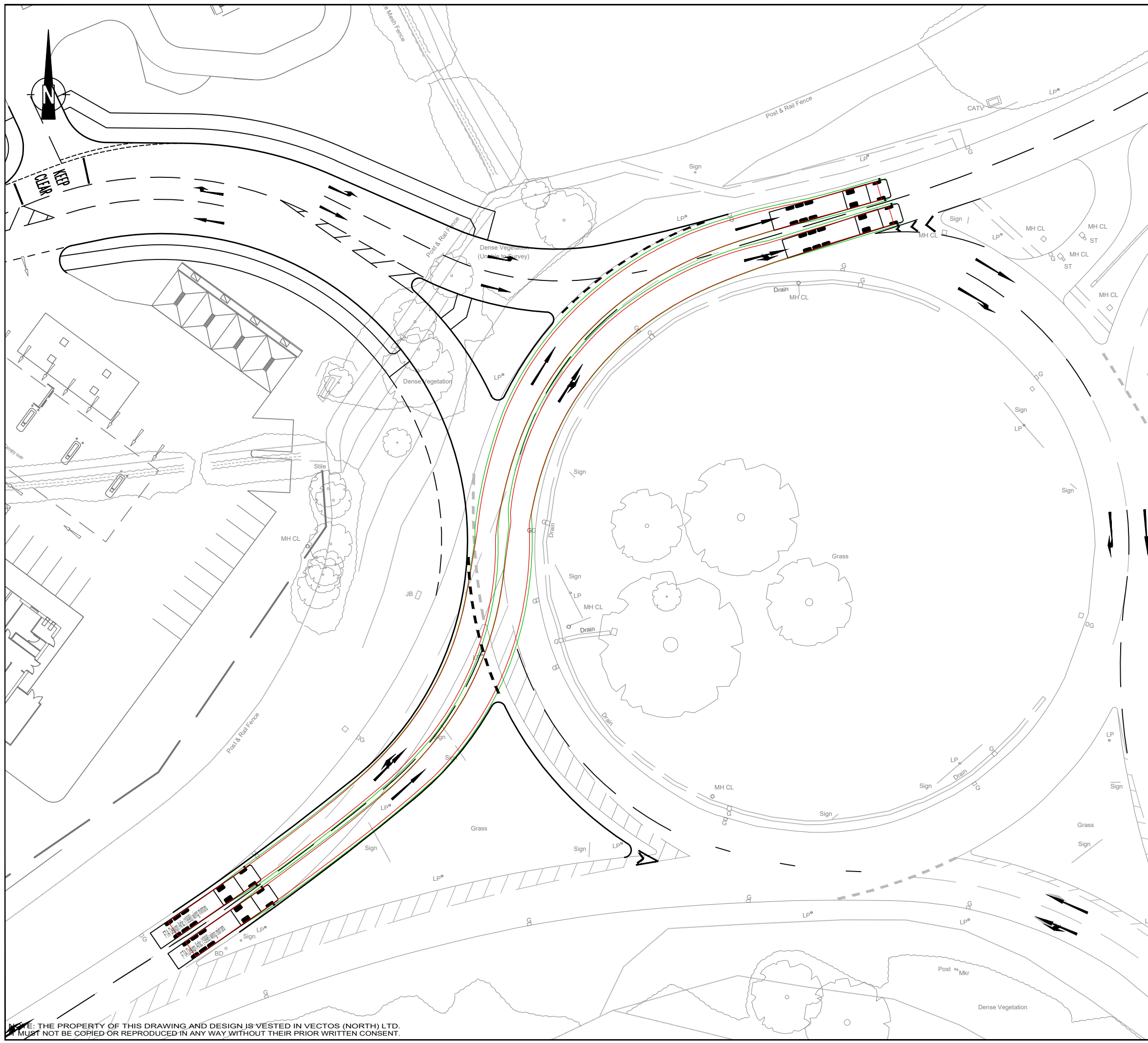
DRAWN: DLB CHECKED: TR DATE: Nov 2020



Oxford Place, 61 Oxford Street, Manchester M1 6EQ
t: 0161 228 1008 e: manchester@vectos.co.uk

DRAWING NUMBER: **VN40390-SK001/GEO-2** REVISION: .

NOTE: THE PROPERTY OF THIS DRAWING AND DESIGN IS VESTED IN VECTOS (NORTH) LTD. IT MUST NOT BE COPIED OR REPRODUCED IN ANY WAY WITHOUT THEIR PRIOR WRITTEN CONSENT.



Notes:

-
-

D	Layout changed with W circ widening	dlb	TR	19.11.20
C	Wing mirrors added to max artic tracks	dlb	TR	16.11.20
B	Tracks adjusted to widened A59 entry	dlb	TR	10.11.20
A	RSA1 change, item 5.2 - A59 entry widened	dlb	TR	22.07.20

REV.	DETAILS	DRAWN	CHECKED	DATE

CLIENT:
Maple Grove Developments

PROJECT:
Whalley Clitheroe

DRAWING TITLE:
**Proposed 4th Arm off
A59/A671 Roundabout
Swept Path Analysis (1)**

SCALES:
1:500 at A3

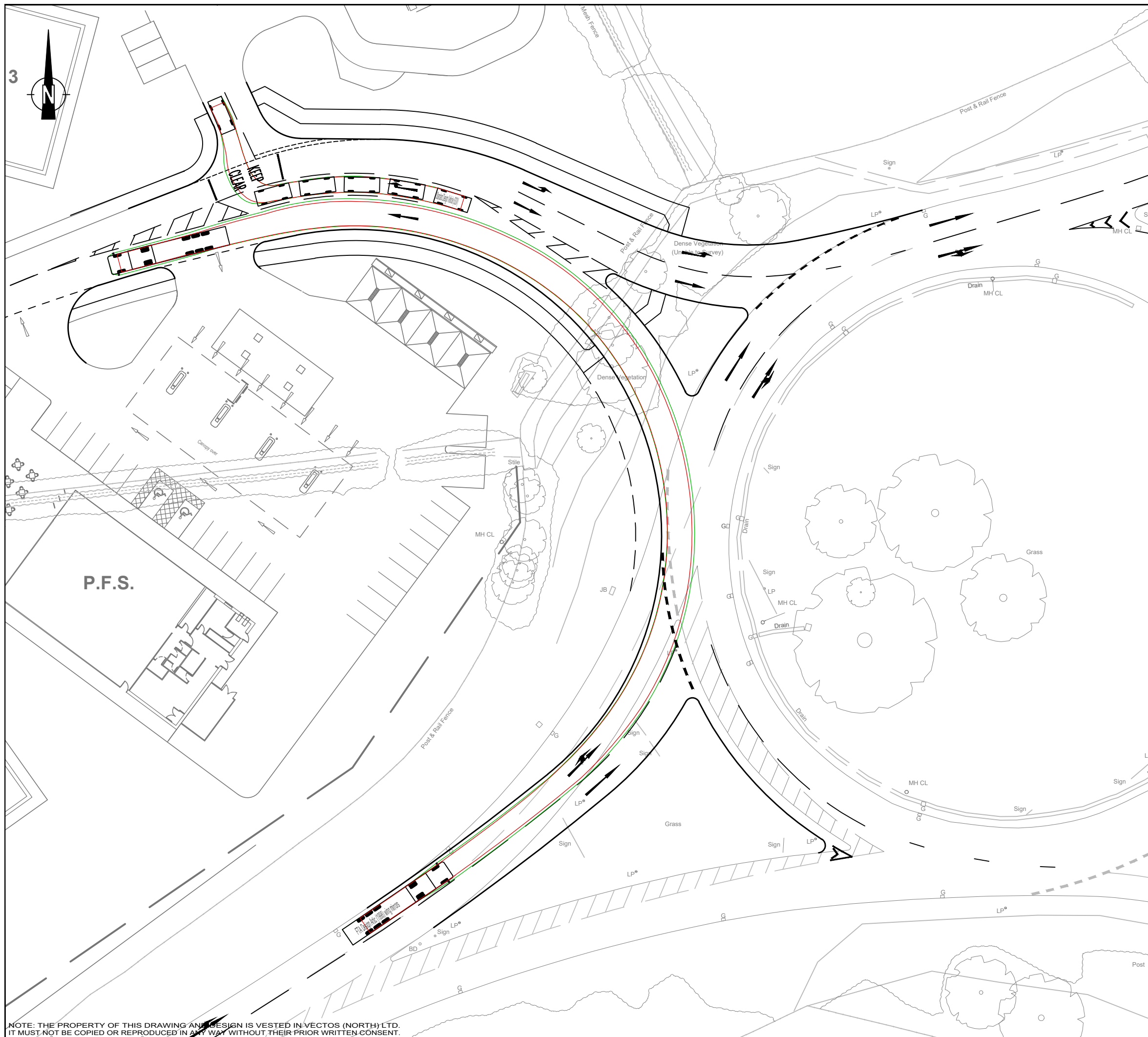
DRAWN:	DLB	CHECKED:	TR	DATE:	Feb 2020
--------	-----	----------	----	-------	----------

vectoros
highway infrastructure specialists

Oxford Place, 61 Oxford Street, Manchester M1 6EQ
t: 0161 228 1008 e: manchester@vectoros.co.uk

DRAWING NUMBER: VN40390-SK001/SPA-1	REVISION: D
---	-----------------------

NOTE: THE PROPERTY OF THIS DRAWING AND DESIGN IS VESTED IN VECTOS (NORTH) LTD.
IT MUST NOT BE COPIED OR REPRODUCED IN ANY WAY WITHOUT THEIR PRIOR WRITTEN CONSENT.



Notes:

- 1.
- 2.

D	Layout changed with W circ widening	DLB	TR	19.11.20
C	Wing mirrors added to max artic tracks	DLB	TR	16.11.10
B	Max artic path altered to widened access	DLB	TR	19.06.20
A	2x4.8m cars added to RT lane queue	DLB	TR	27.05.20

REV.	DETAILS	DRAWN	CHECKED	DATE
------	---------	-------	---------	------

CLIENT:
Maple Grove Developments

PROJECT:
Whalley Clitheroe

DRAWING TITLE:
**Proposed 4th Arm off
 A59/A671 Roundabout
 Swept Path Analysis (2)**

SCALES:
1:500 at A3

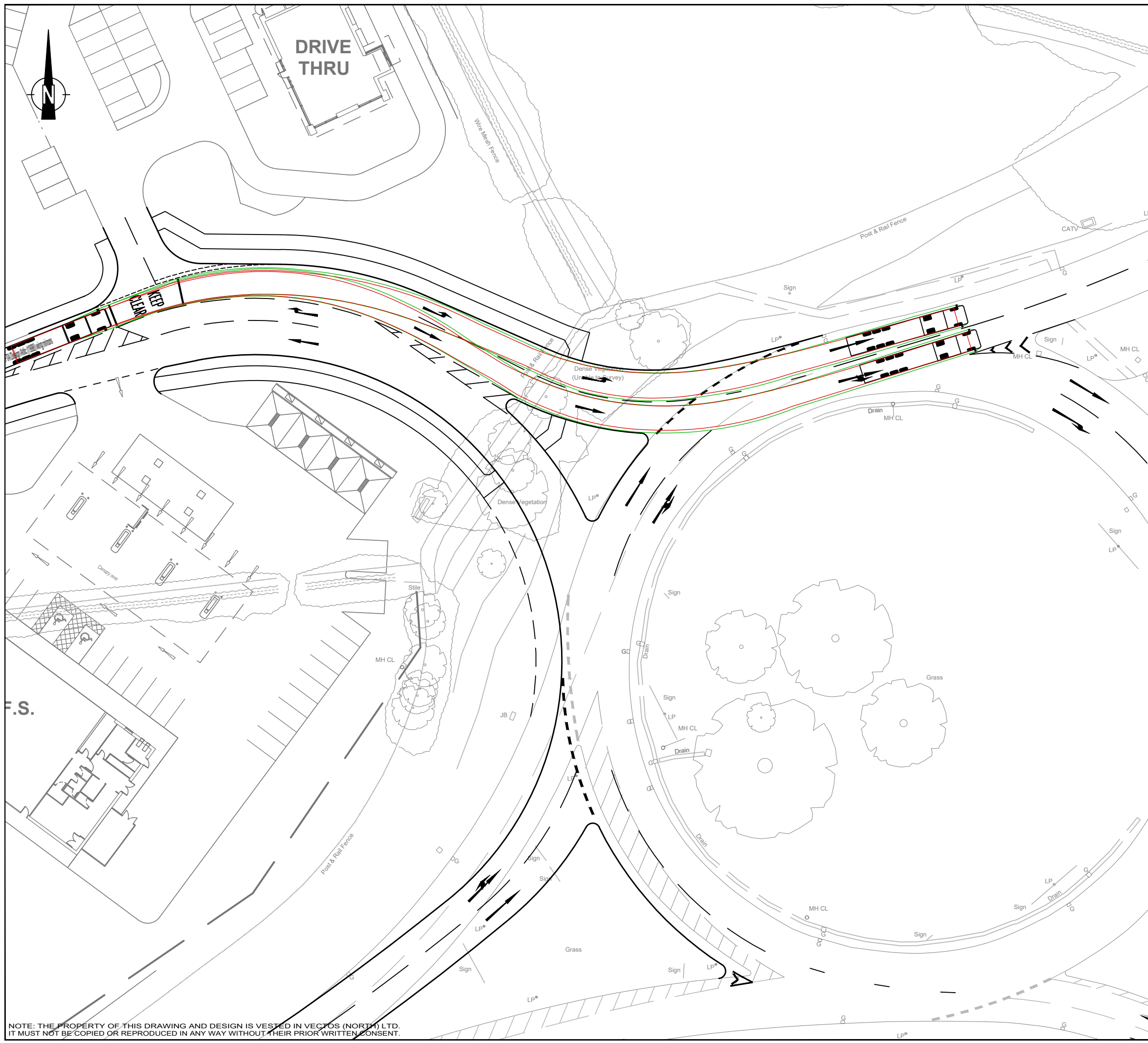
DRAWN:	DLB	CHECKED:	TR	DATE:	Feb 2020
--------	-----	----------	----	-------	----------



Oxford Place, 61 Oxford Street, Manchester M1 6EQ
 t: 0161 228 1008 e: manchester@vectos.co.uk

DRAWING NUMBER:	VN40390-SK001/SPA-2	REVISION:	D
-----------------	----------------------------	-----------	----------

NOTE: THE PROPERTY OF THIS DRAWING AND DESIGN IS VESTED IN VECTOS (NORTH) LTD. IT MUST NOT BE COPIED OR REPRODUCED IN ANY WAY WITHOUT THEIR PRIOR WRITTEN CONSENT.



Notes:

- 1.
- 2.

REV.	DETAILS	DRAWN	CHECKED	DATE
D	Layout changed with W circ widening	dlb	TR	19.11.20
C	Wing mirrors added to max artic tracks	dlb	TR	16.11.20
B	Tracks adjusted to widened site arm entry	dlb	TR	10.11.20
A	RSA1 change, item 5.2 - site entry widened	dlb	TR	22.07.20

CLIENT:
Maple Grove Developments

PROJECT:
Whalley Clitheroe

DRAWING TITLE:
**Proposed 4th Arm off
 A59/A671 Roundabout
 Swept Path Analysis (3)**

SCALES:
1:500 at A3

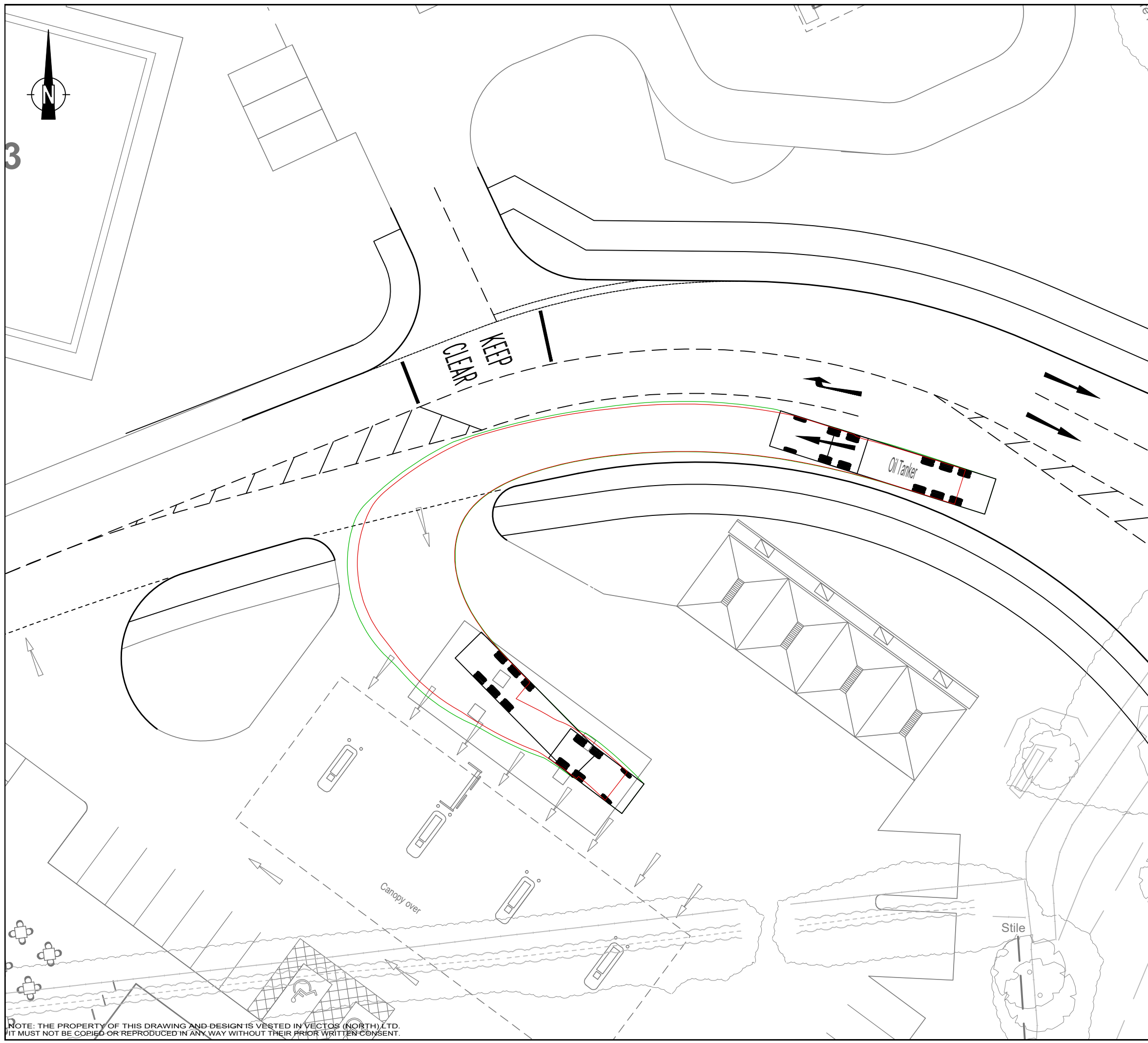
DRAWN: DLB CHECKED: TR DATE: Feb 2020



Oxford Place, 61 Oxford Street, Manchester M1 6EQ
 t: 0161 228 1008 e: manchester@vectos.co.uk

DRAWING NUMBER: **VN40390-SK001/SPA-3** REVISION: **D**

NOTE: THE PROPERTY OF THIS DRAWING AND DESIGN IS VESTED IN VECTOS (NORTH) LTD. IT MUST NOT BE COPIED OR REPRODUCED IN ANY WAY WITHOUT THEIR PRIOR WRITTEN CONSENT.



Notes:
1.
2.

REV.	DETAILS	DRAWN	CHECKED	DATE
A				

CLIENT:
Maple Grove Developments

PROJECT:
Whalley Clitheroe

DRAWING TITLE:
**Proposed 4th Arm off
A59/A671 Roundabout
Swept Path Analysis (4)**

SCALES:
1:250 at A3

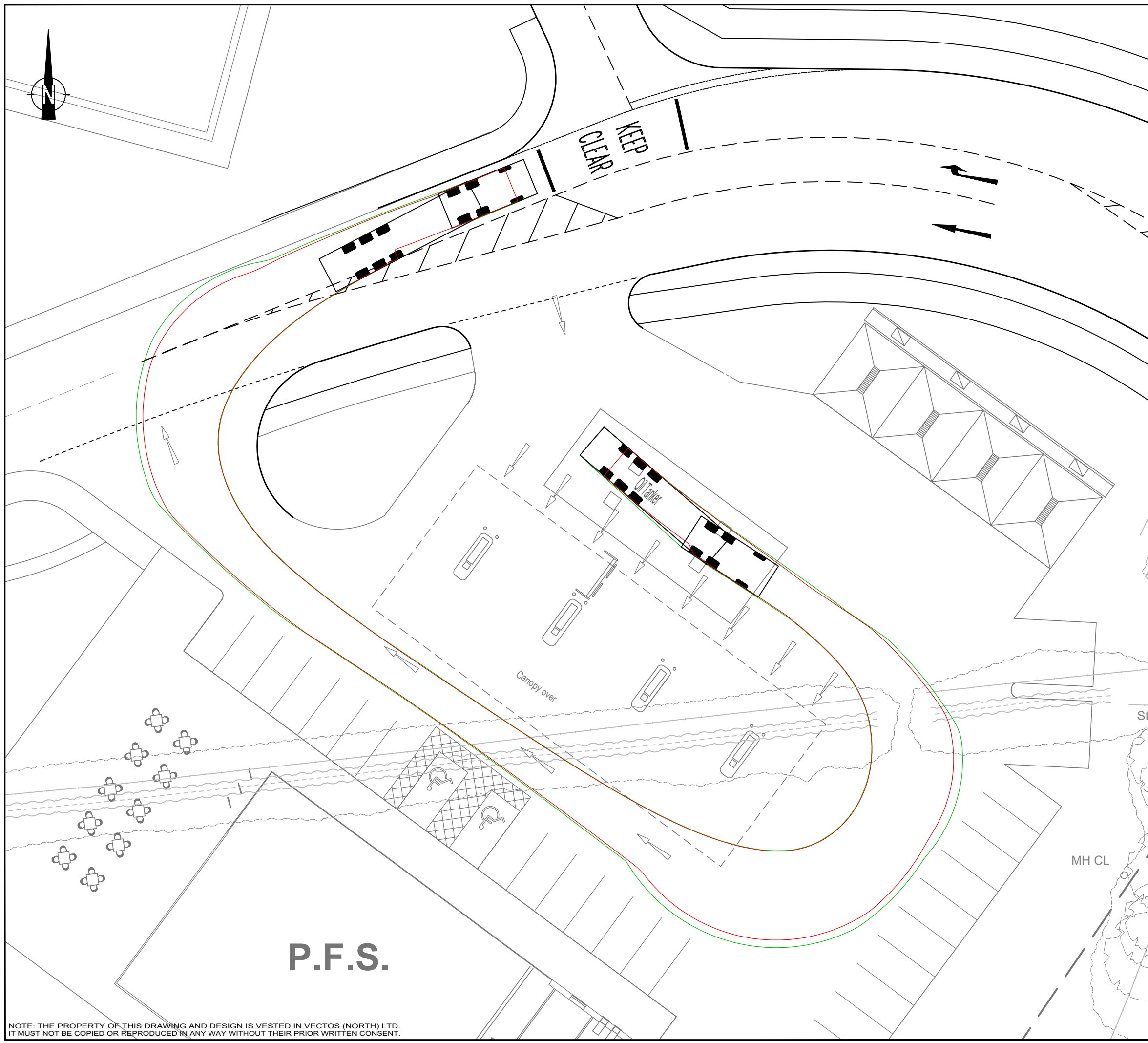
DRAWN:	DLB	CHECKED:	TR	DATE:	Jun 2020
--------	-----	----------	----	-------	----------

vectoros
highway infrastructure specialists

Oxford Place, 61 Oxford Street, Manchester M1 6EQ
t: 0161 228 1008 e: manchester@vectoros.co.uk

DRAWING NUMBER: VN40390-SK001/SPA-4	REVISION: .
---	----------------

NOTE: THE PROPERTY OF THIS DRAWING AND DESIGN IS VESTED IN VECTOS (NORTH) LTD.
IT MUST NOT BE COPIED OR REPRODUCED IN ANY WAY WITHOUT THEIR PRIOR WRITTEN CONSENT.



P.F.S.

Notes:
 1.
 2.

REV.	DETAILS	DRAWN	CHECKED	DATE
A				

CLIENT:
Maple Grove Developments

PROJECT:
Whalley Clitheroe

DRAWING TITLE:
**Proposed 4th Arm off
 A59/A671 Roundabout
 Swept Path Analysis (5)**

SCALES:
1:250 at A3

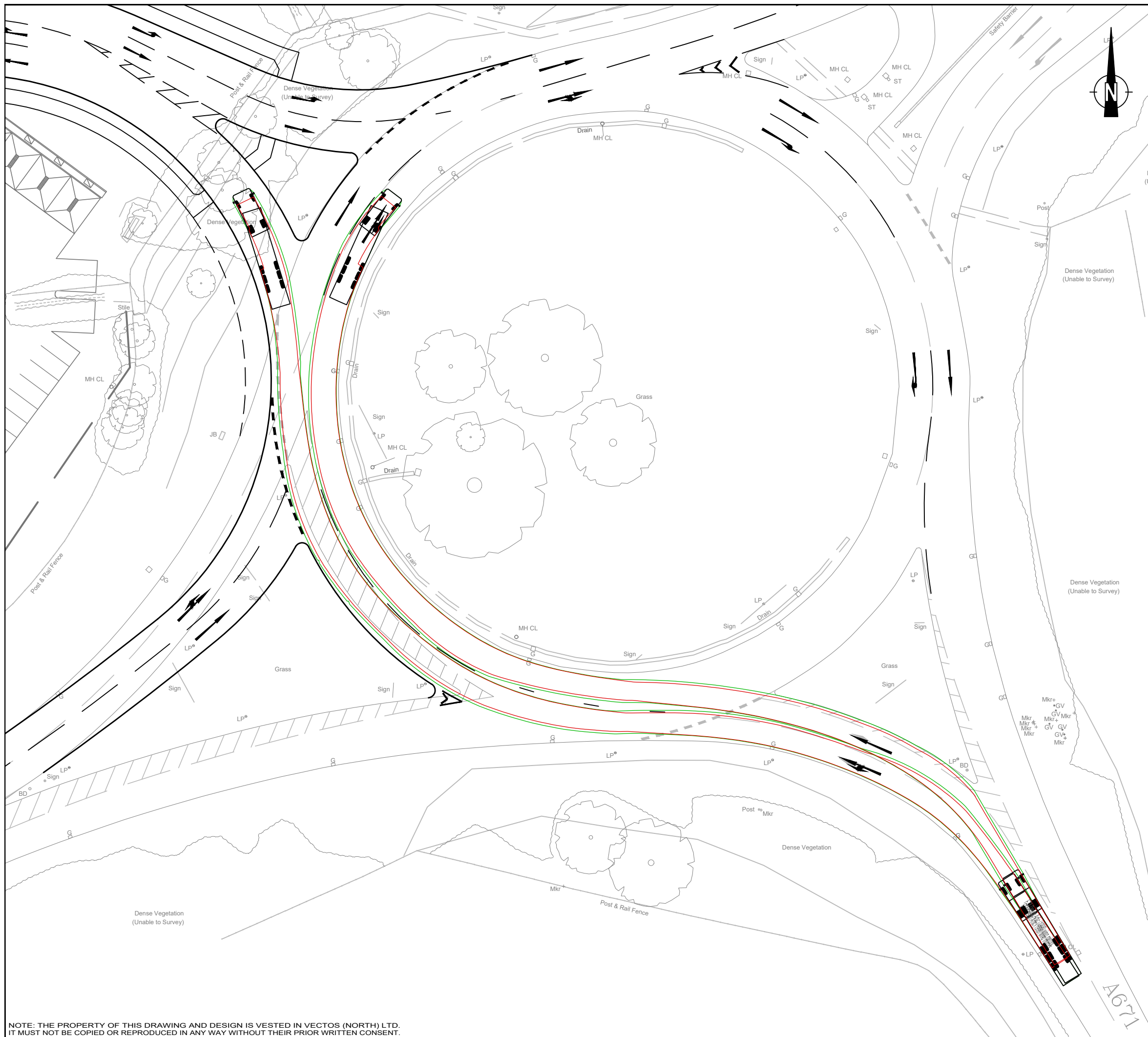
DRAWN:	DLB	CHECKED:	TR	DATE:	Jun 2020
--------	-----	----------	----	-------	----------

vectoros
 highway infrastructure specialists

Oxford Place, 61 Oxford Street, Manchester M1 6EQ
 t: 0161 228 1008 e: manchester@vectoros.co.uk

DRAWING NUMBER: VN40390-SK001/SPA-5	REVISION: .
---	----------------

NOTE: THE PROPERTY OF THIS DRAWING AND DESIGN IS VESTED IN VECTOS (NORTH) LTD. IT MUST NOT BE COPIED OR REPRODUCED IN ANY WAY WITHOUT THEIR PRIOR WRITTEN CONSENT.



Notes:
 1.
 2.

REV.	DETAILS	DRAWN	CHECKED	DATE
A				

CLIENT:
Maple Grove Developments

PROJECT:
Whalley Clitheroe

DRAWING TITLE:
**Proposed 4th Arm off
 A59/A671 Roundabout
 Swept Path Analysis (6)**

SCALES:
1:500 at A3

DRAWN:	DLB	CHECKED:	TR	DATE:	Nov 2020
--------	-----	----------	----	-------	----------

vectoros
 highway infrastructure specialists

Oxford Place, 61 Oxford Street, Manchester M1 6EQ
 t: 0161 228 1008 e: manchester@vectoros.co.uk

DRAWING NUMBER: VN40390-SK001/SPA-6	REVISION: .
---	----------------

NOTE: THE PROPERTY OF THIS DRAWING AND DESIGN IS VESTED IN VECTOS (NORTH) LTD. IT MUST NOT BE COPIED OR REPRODUCED IN ANY WAY WITHOUT THEIR PRIOR WRITTEN CONSENT.



Notes:
 1. This is not a construction drawing and is intended for illustrative purposes only.
 2. White lining is indicative only.

REV.	DETAILS	DRAWN	CHECKED	DATE
B	Site layout updated	TO	TR	24.07.20
A	Site layout updated	WD	TR	22.04.20

CLIENT:
Maple Grove Developments

PROJECT:
Whalley, Clitheroe

DRAWING TITLE:
**Proposed Pedestrian Refuge,
 Clitheroe Road**

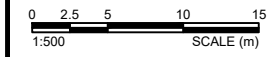
SCALES:
1:500 at A3

DRAWN: TO CHECKED: TR DATE: 24.07.20



4th Floor Oxford Place, 61 Oxford Street, Manchester, M1 6EQ
 0161 228 1008 e: manchester@vectos.co.uk

DRAWING NUMBER: **VN91274-D101** REVISION: **B**



NOTE: THE PROPERTY OF THIS DRAWING AND DESIGN IS VESTED IN VECTOS (NORTH) LTD. IT MUST NOT BE COPIED OR REPRODUCED IN ANY WAY WITHOUT THEIR PRIOR WRITTEN CONSENT.



Notes:
 1. This is not a construction drawing and is intended for illustrative purposes only.
 2. White lining is indicative only.

Proposed Dropped
Kerb and Tactile Paving

Proposed Dropped
Kerb and Tactile Paving

Proposed Refuge Island
(Dropped Kerb and
Tactile Paving)

CLITHEROE ROAD

CARE HOME

UNIT 11

UNIT 5



NOTE: THE PROPERTY OF THIS DRAWING AND DESIGN IS VESTED IN VECTOS (NORTH) LTD.
 IT MUST NOT BE COPIED OR REPRODUCED IN ANY WAY WITHOUT THEIR PRIOR WRITTEN CONSENT.

REV.	DETAILS	DRAWN	CHECKED	DATE
B	Site layout updated	TO	TR	24.07.20
A	Site layout updated	WD	TR	22.04.20

CLIENT:
Maple Grove Developments

PROJECT:
Whalley, Clitheroe

DRAWING TITLE:
**Proposed Arrangement
 Along Clitheroe Road
 (Footway Links)**

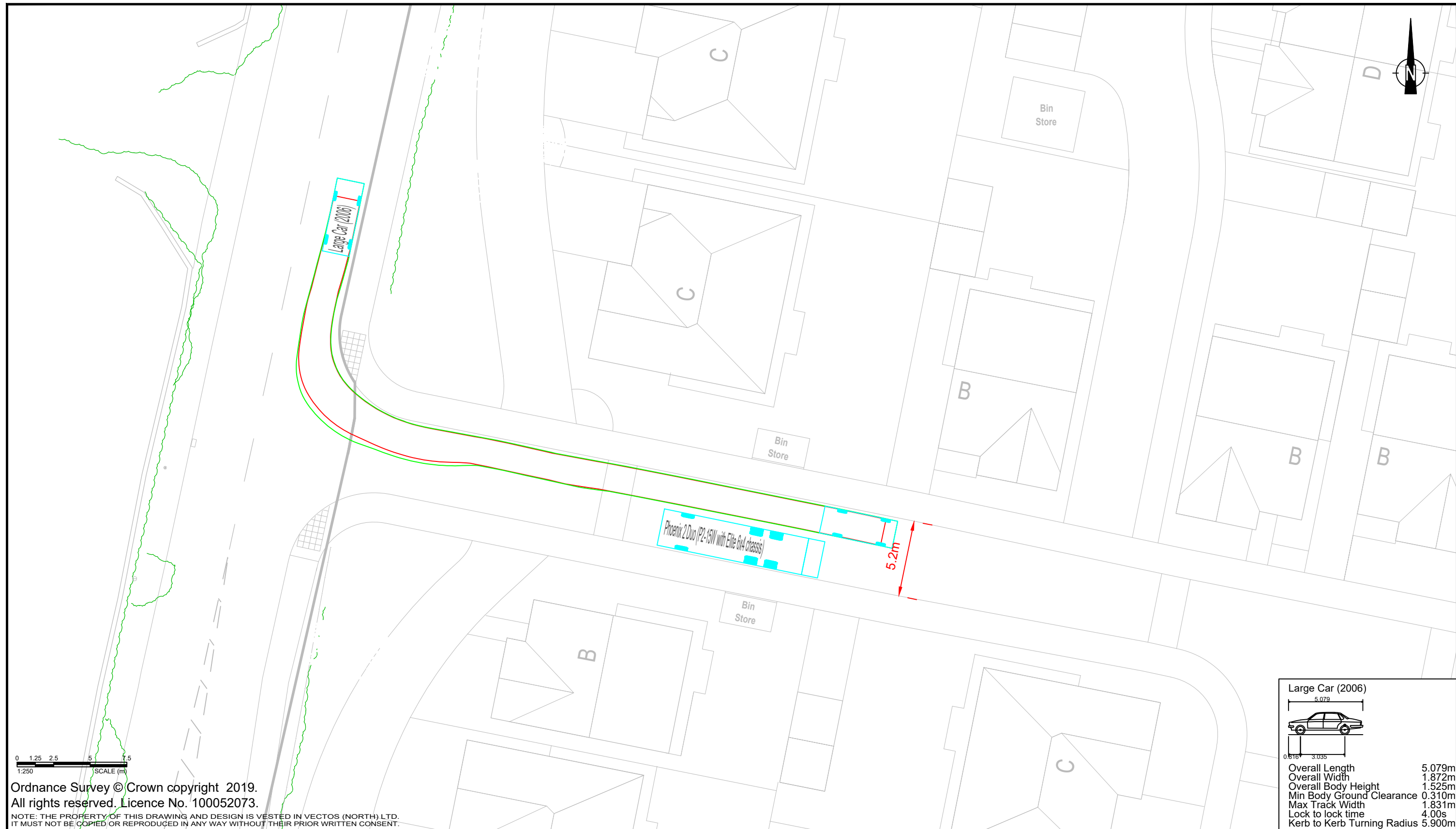
SCALES:
1:1000 at A3

DRAWN: TO CHECKED: TR DATE: 24.07.20



4th Floor Oxford Place, 61 Oxford Street, Manchester, M1 6EQ
 0161 228 1008 e: manchester@vectos.co.uk

DRAWING NUMBER: **VN91274-D102** REVISION: **B**



0 1.25 2.5 5 7.5
1:250 SCALE (m)

Ordnance Survey © Crown copyright 2019.
All rights reserved. Licence No. 100052073.

NOTE: THE PROPERTY OF THIS DRAWING AND DESIGN IS VESTED IN VECTOS (NORTH) LTD.
IT MUST NOT BE COPIED OR REPRODUCED IN ANY WAY WITHOUT THEIR PRIOR WRITTEN CONSENT.

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

REV.	DETAILS	DRAWN	CHECKED	DATE
A	Site layout amended	TO	TR	24.07.20

Notes:

- This is not a construction drawing and is intended for illustrative purposes only.
- White lining is indicative only.

Whalley, Clitheroe

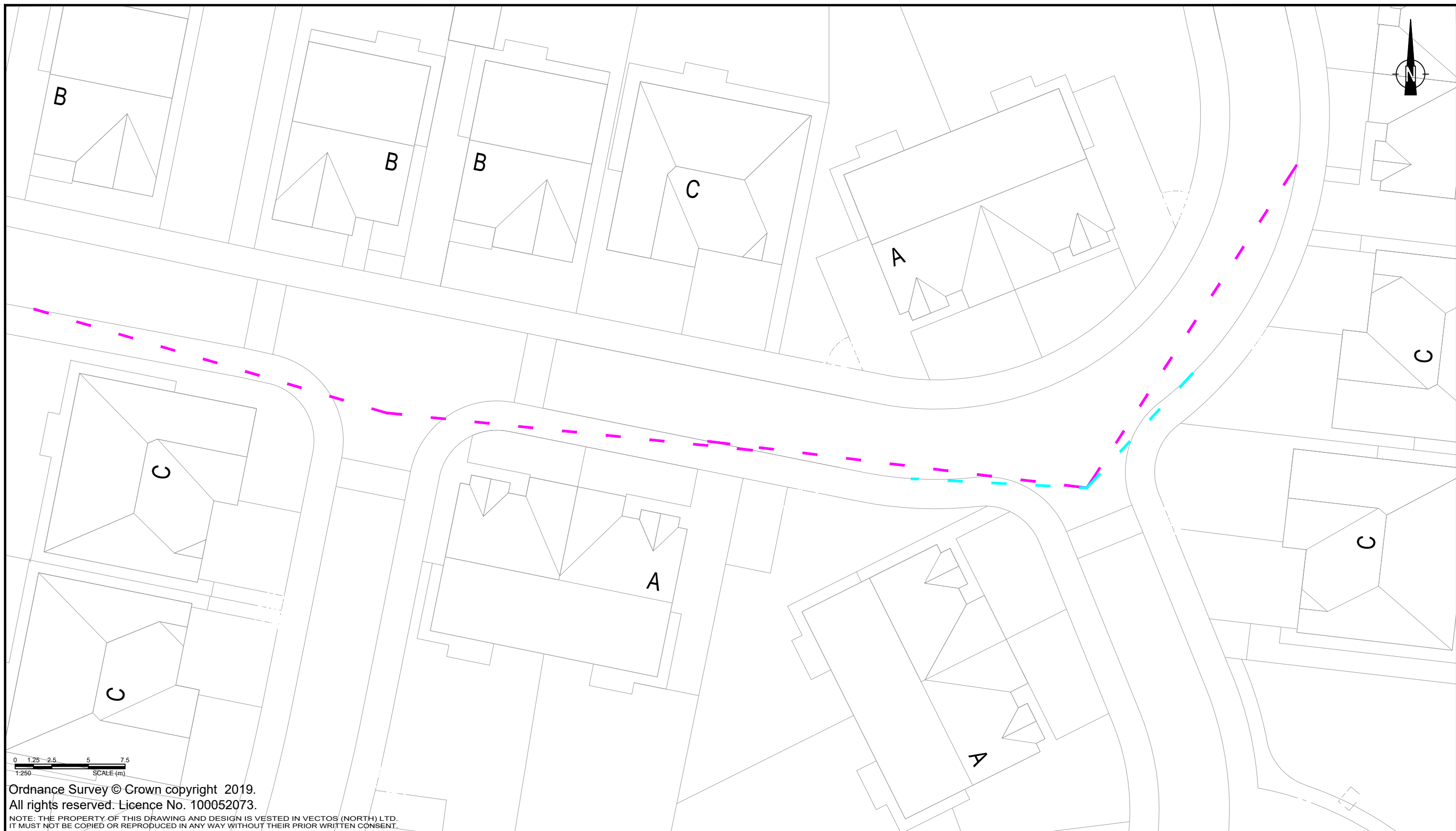
Swept Path Analysis - Large Car

DRAWN: TO CHECKED: TR DATE: 24.07.20 SCALES: 1:250 at A3

Maple Grove Developments

4th Floor Oxford Place, 61 Oxford Street, Manchester, M1 6EQ
0161 228 1008 e: manchester@vectos.co.uk

DRAWING NUMBER: VN91274-TR103 REVISION: A



0 1.25 2.5 5 7.5
SCALE (m)
1:250

Ordnance Survey © Crown copyright 2019.
All rights reserved. Licence No. 100052073.

NOTE: THE PROPERTY OF THIS DRAWING AND DESIGN IS VESTED IN VECTOS (NORTH) LTD.
IT MUST NOT BE COPIED OR REPRODUCED IN ANY WAY WITHOUT THEIR PRIOR WRITTEN CONSENT.

REV.	DETAILS	DRAWN	CHECKED	DATE

Notes:

1. This is not a construction drawing and is intended for illustrative purposes only.
2. White lining is indicative only.

- - - - - 2.4 x 25m Visibility Splay
- - - - - 2.4 x Visibility Splay to Tangent of Kerb

Whalley, Clitheroe		Maple Grove Developments	
Junction Visibility Splays		vectos.	
4th Floor Oxford Place, 61 Oxford Street, Manchester, M1 6EQ 0161 228 1008 e: manchester@vectos.co.uk		4th Floor Oxford Place, 61 Oxford Street, Manchester, M1 6EQ 0161 228 1008 e: manchester@vectos.co.uk	
DRAWN: WD	CHECKED: TR	DATE: 27.11.20	SCALES: 1:250 at A3
DRAWING NUMBER: VN91274-D103		REVISION: .	

Appendices

Appendix A – LCC Highways Comments

Ribble Valley Borough Council
Council Offices,
Church Walk,
CLITHEROE,
Lancashire,
BB7 2RA

Phone: (01772) 534057
Fax:
Email: Neil.Stevens@lancashire.gov.uk
Your ref: 3/2019/0545
Our ref: 320190545NJS
Date: 7th January 2020

TOWN AND COUNTRY PLANNING ACT 1990

Application Ref 3/2019/0545

Proposed mixed use development land between Clitheroe Road and A59/A671 roundabout junction, Barrow

I refer to the above proposal and would like to thank you for the opportunity to provide highway comments. Lancashire County Council (LCC) as the Local Highway Authority is responsible for providing and maintaining a safe and reliable highway network. With this in mind, the present and proposed highway systems have been considered to highlight areas of concern that potentially could cause problems for the public (familiar and unfamiliar), cyclists, public transport, motorists and other vehicles in and around the area of the development.

Unfortunately, this proposal did not include the benefits of pre-application discussions and no discussions have taken place in the preparation of this application with the highway authority. Notwithstanding this, VECTOS does have the benefit of historic knowledge of the wider Barrow area representing other applicants.

The following executive summary provides the current position based on the submitted documentation. I would welcome dialogue with the applicants transport consultant to allow matters be suitably concluded.

Executive Summary and Recommendation

There are concerns with analysis as presented, as a consequence the level of impact is currently unknown to whether the level of motorised trips can be accommodated in the surrounding network. No evidence has been presented that demonstrates that the A59/A671 roundabout satisfies current design standards (all arms). In addition I am not satisfied that the hybrid layout/access strategy satisfies users needs and I also have safety concerns. To a lesser extent from a sustainability perspective it appears that most of the employment is beyond 400m of a bus stop, this is a weakness. The supporting travel plan framework is very limited in content and does not provide

certainty that the site will be made sustainable and ambitious targets will be set, met and sustained.

Lancashire County Council is unable to support the application as presents due to lack of information and is not currently satisfied that a safe and suitable access (to and within) has been provided. The layout detail does not satisfy all modes and users needs. It is disappointing that the site layout and infrastructure has not exploited existing opportunities by strengthening linkages from Barrow to the A59 for the existing and new community.

1.0 Site Location

The site is located to the east of Clitheroe Road, Barrow and to the north of the A59.

2.0 Development Description

Hybrid planning application for mixed use development.

In full: the erection of 48 bungalows for persons aged 55 years and over (C3) and a 64 bedroom care home (C2) (with vehicular and pedestrian access from Clitheroe Road) and a drive-thru restaurant (A3) and associated customer car parking (with vehicular access from the A59).

In outline: all matters reserved except access, employment units (being B1 and or B2 and or B8) and a petrol filling station (sui generis) and convenience store (A1) with associated customer car parking and vehicular access from the A59.

3.0 Motorised Access and Sustainable Provision

The access strategy for motorised vehicles is via a new priority junction from Clitheroe Rd/Whalley Rd (Barrow) for the residential and care home elements. All other uses is from a new access onto the A59/A671 roundabout. Ped/cycle linkages are indicated between residential and employment/PFS/drive through elements.

3.1 Motorised Access via the A59/A671

I do not challenge the principle that the site could be served off the A59/A671 roundabout via a new 4th arm, however no evidence has been presented that the full roundabout with the 4th arm satisfies all current design standards. Notwithstanding design standards are a number of operational matters which will need to be picked up to overcome my safety issues such as:

- fast entry into the roundabout from the west (existing arm) with a slow exit into your site. This could result in rear end shunts.
- conflict as a consequence of local proposed access points (entering the PFS and enter/exit the drive through) in close proximity to the roundabout, slow circulating speed on the spine road due to road alignment. These events could result in vehicles waiting within the roundabout and is a safety concern.

Once I am satisfied with the roundabout and connecting road into the site (from a layout and modelling perspective), as the existing junction forms part of a high speed corridor it is important that a S1 safety audit is produced and fully satisfied. Hedges/trees will need to be trimmed back/removed as part of the scheme. It is not clear on the verge/foot/cycleway extent as part of the 4th arm layout.

Notes: The modelling undertaken does not replicate the existing situation with its dedicated west to east lane. The model with development is currently not acceptable.

As the road from the roundabout only satisfies commercial purposes has no public utility, with this, it cannot be considered suitable for adoption. See section on layout matters for further comments.

3.2 Motorised access onto Whalley Rd/Clitheroe Rd corridor

I have no concerns with the access location and that visibility can be achieved. However the plans do not indicate the extend of new cycle/footway on Whalley Rd/Clitheroe Rd. the foot/cycleway detail as presented at Lamb Roe Gardens is misleading (no foot/cycle way currently exists. Notwithstanding these anomalies, once the extent is agreed, safe crossing provision over Whalley Rd/Clitheroe Rd will be required to support movements from the site to the south as well as dropped crossings at Lamb Roe Gardens. In addition consideration to need to be given to overcome visibility issues between ped/cyclists and motorists from Lamb Roe Gardens.

The 2 side roads onto the proposed residential spine road are approximately 7m away from the site junction. This could result in vehicles waiting within the junction mouth as a vehicle exits, in addition, also promotes poor use of the highway for certain movements. Further proposed trees could also hinder visibility. These are safety issues.

*Notes: I have concerns with the internal road widths as proposed to support a large car and a service vehicle including wing mirrors and also having regard to the bend within the spine road. I am aware of the source of the 4.8m and 5.5m as being from MfS, however as stated **they are NOT necessarily recommendations.***

Hedges will need to be trimmed back as part of the scheme.

See section on layout matters for further comments including what could be considered for adoption (assuming all design matters are satisfied).

3.3 Sustainable provision and wider connectivity

The non-motorised provision linking both sections of the proposed site need to be available and useable at all times of year whether day/night time therefore must be illuminated and constructed using a permanent material with appropriate drainage provision (and maintained by a site maintenance company and controlled by a legal agreement). Hedges will need to be trimmed back as part of the scheme. All sustainable provision linked to a planning condition which requires the above to be satisfied and that it be fit for purpose and open for use prior to the occupation of any building irrespective of phasing.

Whilst a route is proposed (see section on layout for further comments) it appears that most of the employment is beyond 400m of a bus stop. The detail is not clear on the widths of the footways or the foot/cycle ways throughout the site providing access to all units (whether residential, employment/drive through or PFS).

I have concerns with the supporting travel plan and that the site is considered sustainable and can be maintained as such, this relates to each element and for the proposal as a whole. See section on Travel Plan.

3.4 Layout matters

3.4.1 Commercial Layout (Employment/PFS and drive through)

The access onto the A59 high speed road provides a point of motorised access which is acceptable as a junction form, however there are design matters and operational matters that need to be overcome.

Whilst a footway is being promoted at the roundabout access, as presented does not provide any benefit, as a suggestion it could be extended to include existing footways linking into FP6/11 circa a further 50m to the east and I would also suggest provision to be provided extending a further 20m to the west.

The swept paths for the 'Drive Through' for the purposes of delivery/waste collection does appear to be very close to parking bays which are 4.8mx2.4m (these are historic sizes and do not necessarily satisfy large cars/SUV's or vans), this does not allow for any error by the delivery/waste collection driver and requires cars/vans to be parked within bays which is unlikely. I note that a 10.2m service vehicle has been used, I am aware that a number of LPA's are now using an 11m vehicle for waste collection. This needs to be confirmed as well being suitable for commercial collections. No swept path have been produced at the access (in and out). Right turn storage is required on the link road into the drive through.

Note a large SUV is circa 5m x2m (Volvo SC90) in length a mid-size van 5.5m-6.7mx2.1m (Ford Transit).

As the site is close to the A59 which is used by many medium/large vehicles, no provision is proposed to support these drivers accessing the hot food/drink provision at the drive through. This is likely to result in medium/large vehicles parking on the access road.

No swept path analysis has been undertaken for the PFS for deliveries and for HGV's which I assume will also use the provision. No swept path analysis has been undertaken at the access points (in and out at the separate locations). If HGV's can use the provision I would expect sufficient waiting and manoeuvring provision within the PFS to support the needs of vehicles.

There appears to be limited forward visibility between the PFS exit and exit from units 6-13.

The footway provision between the residential and the PFS, whilst it is supported the desire line is located at a point with limited visibility on the PFS side.

A HGV requires the full road width to access/egress units 6-13. Again a HGV accessing units 1-5+14 will be manoeuvring beyond the centre line with limited forward visibility.

Whilst I note a HGV can manoeuvre within the communal service yard there is no provision for parking or to make deliveries using these vehicles.

What provision is in place to negate against HGV's using the site for overnight parking.

The layout as presented is for commercial purposes and does not provide suitable utility, therefore will not be adopted.

Parking provision is highlighted under a separate heading.

Employment link road through the site with access points as designed will result in conflict within in the site which will impact on the public highway beyond the site. Changes are necessary within.

3.4.2 Residential Layout

At this stage I am not sure what elements (if any) that the developer would wish to be adopted. All deliveries and waste collection to be undertaken including manoeuvring to be undertaken within provision provided negating against third parties placing restriction in place such as barriers. At this stage as presented, the layout is not suitable for adoption.

3.4.3 Care Home

Requires waste collection and deliveries to utilise the entrance of the car park and requires the manoeuvring to be undertaken blind in an environment which includes vulnerable residents. I assume the waste is stored in the western point of the car park requiring the waste vehicle to reverse the full distance. How are deliveries made to the Care Home not impeding on the car park operation?

3.4.4 Dwellings

There are a number of properties where access to off road parking provision is limited or difficult to access/egress. A number of the cul-de-sacs whilst they will be private and not suitable for adoption, no provision is made for deliveries or to support a manoeuvring vehicle and safe waste collection.

There is limited forward visibility with the highways at the bend

As highlighted within the plans the 2 side roads onto the spine road are approximately 7m away from the site junction. This could result in vehicles waiting within the junction mouth as a vehicle exits, in addition also promotes poor use of the highway for certain

movements. Proposed trees could also hinder visibility. This layout is not suitable for waste collection. This detail is not acceptable.

With regard to road widths again as highlighted in para 3.2 I have concerns with the internal road widths as proposed to support a large car and a service vehicle including wing mirrors and also having regard to the bend within the spine road. A number of details will require to be modified before the layout can be considered suitable.

3.5 Electric charging points

The TA indicates that electric charging points to be agreed with LCC, as no pre-application discussions have taken place, no agreement has been made. Notwithstanding this all dwellings to include a charging facilities and I would require the PFS/drive through to have fast charge provision with some future provision for the employment element.

It is important that the provision which is yet to be agreed can be expanded on without disruption, with this I would suggest that addition ducting within car parks to be provided future proofing the site.

3.6 Parking Standards

Whilst the TA indicates that parking has been [provided in accordance with LCC standards. It is important that each unit has sufficient provision and for specific uses such as the drive through, and there is an evidence base that highlights sufficient provision for a typical day using agreed trip rates (yet to be agreed) i.e. car park accumulation.

3.6.1 Employment

Having regard to the location of the site and the GFA of each unit (with units being B1/B2/B8) having 1 space per 50m², I consider to be insufficient. I would be looking at circa 1 space per 40m. Each unit needs to have dedicated parking to satisfy needs and identified on a plan.

Note as no through route is being proposed it is likely that some local employees will park in the residential area and walk to their place of employment, this will be exacerbated if insufficient parking provision is provided on site.

3.6.2 Care Home

The Care Home is for 64 residents by my calculations equates to 13 spaces, 31 spaces are proposed, this appears to be an overprovision.

3.6.3 Drive through

A 170m² GFA Drive through by my calculations equates to 34 spaces, this is as proposed. Notwithstanding this, car parking accumulation analysis is required using trip rates yet to be agreed.

3.6.4 PFS

An 8 pump PFS with 280m² of retail equates to a 28 spaces, 24 spaces are proposed which should satisfy demand.

3.6.5 Residential

Assuming the bungalows are circa 2 bedrooms would require 2 spaces per dwelling, 1 bed bungalows would be 1 space.

4.0 PROW

The PROW will need to be relocated to support the development.

5.0 Accident Review

The TA has reviewed accident data in the vicinity of the site and concludes that *'based on the accident analysis it is therefore confirmed that there are no existing highway safety issues in the vicinity of the site'*, I do not disagree with their conclusion on this matter.

6.0 Travel Plan

A one page travel plan framework has been submitted. It does not provide sufficient information or commitment /financial commitment that this mixed use development will or can be made sustainable. This is not acceptable as presented.

A financial commitment is required from the developer to ensure appropriate funding is available to support delivery of initiatives/measures to satisfy and maintain Travel Plan targets.

Note: This funding would only be required to be used by the developer if their Travel Plan targets are not achieved (funding to be made available to the developers appointed travel plan coordinator and not passed to the LPA or the LHA). It is recommended that the level of financial commitment/funding must be sufficient to deliver a real change to more sustainable modes. For example sufficient to fund a bicycle (and safety equipment) for each household. LCC consider funding of £250 per dwelling is appropriate for this site with additional financial commitment for the employment element. All commitments to be retained by the developers appointed travel plan coordinator for 5 years for each dwelling/unit from first occupation.

7.0 Analysis of network and local junctions

7.1 Traffic Growth

The TA has applied an assessment year of 5 years post submission date. Whilst this may be in line with guidance (reasonable regard must be had to full site buildout). As

presented this is a further weakness of the application, when regard is had to the scale of application and that elements are in full/outline.

Alternative assumptions have been applied to TEMPRO as VECTOS suggest to remove double counting of dwellings as a consequence of permitted housing which is separately included within the analysis. This results in a growth of around 0.34% per year. No regard has been given to other aspects of growth such as the influence of construction of the committed developments or other external influences. Traffic growth and assumptions included in growth is based on an area wide approach. It is unreasonable that growth on Whalley Rd/Clitheroe Rd is identical to the A59.

7.2 Committed Development

A number of committed developments have been considered such as Barrowlands. The TA highlights that reserved applications have been approved for 408 units which is less than the outline site of 504. In the analysis for the Barrowland application regard was had to the Lawonsteads link providing relief to Whalley which was a concern at the time. I am informed that the Lawonsteads application and the link road are progressing through due process. To overcome a concern and the lack of wider consideration within this TA that there would be merit in having a Grampian type condition on the commencement of the link road at the A671 end which is not in the county councils control to deliver.

Lawsonsteads has approval for 214 units which is less than the 260 dwellings. Consideration has also been given to land at Mitton Rd and Standen. I do note that Vectos have extrapolated Standen's analysis to take account of the impacts on the A59 and A671. The inclusion of the Standen analysis is supported, however I would expect that some local traffic would use Whalley Rd especially with the provision/amenities that are located there such education and the rail station.

7.3 Trip Rates

Vectos have used TRICS software package to determine trip rates per land use. I do have a number of concerns

7.3.1 Employment

Having regard to the location and the GFA of each unit (with units being B1/B2/B8) the trip rates proposed are not supported (I disagree with the input parameters the biggest difference is GFA range). My levels of generation are slightly higher. On occasions TRICS does provide anomalies and in this case we know 14 units are proposed and VECTOS suggest that each unit will only attract 0.64 vehicles, this is unlikely.

7.3.2 Care Home

I do not have any comments to make with regard to The Care Home

7.3.3 Drive Through

Having regard to the location and scale of the drivethrough, the trip rates proposed are not supported (I disagree with the input parameters the biggest difference is GFA range). My level of generation is significantly higher. Based on that submitted only suggests that 5 trips will be attracted in the AM peak hour which is unlikely.

Note: I have collected some comparison data on the 7th January 2020 at the McDonalds at the next roundabout on the A59 during the AM which indicates that site attracts 78 vehicles. This is a notable difference to that proposed by VECTOS.

7.3.4 PFS

Having regard to the location of the proposed 8 pump PFS with retail the trip rates proposed are not supported. My level of TRICS generation is higher.

Note: I have collected some comparison data on the 7th January 2020 at the PFS with food at the next roundabout on the A59 during the AM which indicates that site attracts 61 vehicles. This is a slight difference, however my TRICS data would be much higher. With regard to linkages between the PFS and McDonalds was very limited, i.e. much lower than that proposed by VECTOS.

7.3.5 Residential

General trip rates have been used and for the AM are acceptable and for the PM the proposed rates are slightly lower than what would be expected for a privately owned mixed development site. However, as this site is for residential bungalows for the over 55, with this are acceptable.

7.3.5 Cross Visitation and Pass By

Having regard to the location of the development a 50% pass by is acceptable and could be slightly higher. However I do not support a 20% cross visitation. Based on that described in the TA discounting at 20% has been made against the primary PFS trip rates.

Notes: Notwithstanding the differences in the trip rates etc based on the approach proposed does not make sense as the Drive Through AM generation is 5 whereas the PFS is 57.

Most PFS with food also have hot drinks etc to take away, influencing cross visitation.

During the survey of the 7th January limited cross visitation was made between the PFS and McDonalds. I would be happy if surveys were taken at the A59 site and be revised to represent this site, it would also be useful to understand how the cars parks and local network operates during the weekday and weekend.

7.4 Distribution

The TA only includes a distribution image of Ribble Valley MSOA 007. No detail is clear, further information is required.

7.4.1 Residential

I disagree with the distribution proposed. I must highlight the distribution proposes 72% of the residential trips to use the constrained Wiswell Lane. As a suggestion it makes sense to use the distribution as agreed for Barrow Lands (which was produced by Vectos and tested at appeal).

7.4.2 Employment

I cannot locate the supporting evidence in the TA

7.5 Modelled area

The only existing junction considered is the A59/A671 site access roundabout. In addition the new priority access is also modelled. No regard is had to junctions or locations elsewhere which have been subject to appeals such as conditions in Whalley or Whalley Rd junction with A671 (Whalley Rd). Whilst I don't necessarily require other junctions to be modelled I consider it important that a clear audit trail is provided to why no other junctions are required to be modelled, having regard to existing levels of delay and operation and what changes are planned.

I have not reviewed the modelling as a number of matters need to be resolved first, however I do note that the access roundabout in the base scenario is modelled incorrectly as it does not include the freeflow lane that is currently available.

8.0 Flood Risk

LCC are the Lead Local Flood Authority (LLFA), as such I would refer to the LCC Flood Risk Assessment Team for comments provided under a separate response. I would expect a drainage system to be designed to provide adequate capacity following current best practice and required standards that may allow consideration of adoption if deemed appropriate by the relevant authority. I would expect these drainage matters to be a condition of any approval, if Ribble Valley Borough Council were minded to approve this application.

Note: LCC will seek to limit the use of culverts where alternative sustainable solutions can be found. No water storage would be acceptable under a public highway.

9.0 Highway Improvements (S278)

Not yet agreed.

10.0 Planning Contributions (s106)

Planning Obligation requirements are applicable to this site, forming the basis of the Highway Authority response and they are a material planning consideration. Planning contributions will be used to fund and provide for measures which support sustainable communities and developments and to reduce the level of negative impact that would

otherwise be produced by the development by providing infrastructure that facilitates/supports necessary change in travel behaviour. At this stage planning contributions are not yet agreed.

Notwithstanding no agreement on this matters, LCC do offer a Travel Plan support service and for a development of this scale in detail and outline I would require £9,000 to enable Lancashire County Councils Travel Planning Team to provide a range of Travel Plan services for the element in full and a further £6,000 for that in outline when it does come forward.

11.0 Conclusion

I do not accept the modelling results or the conclusion reached by Vectos. I am confident with the active support from Vectos that technical matters can be resolved to allow an accurate conclusion be reached. Internal layout matters will require a number of changes before they can be considered suitable.

General Additional Supporting Notes to assist Vectos

The following general comments are regarding the internal highway layout of the site for planning:-

1. Where the cul-de-sac carriageway width is reduced below 5.5m the carriageway is to vary in width between 4.5 and 6m to allow passing and additional occasional parking a minor percentage of the road width to be 4.5m wide. From Lancashire County Council Residential Design Guide. Where the cul-de-sac serves less than 20 properties the carriageway to vary in width between 4.1 and 6m to allow passing and additional occasional parking a minor percentage of the road width to be 4.1m wide. While diagram 7.1 from Manual for Streets illustrates what various carriageway widths can accommodate, they are not necessarily recommendations. The cul-de-sacs are also shared access roads where pedestrians are expected including mobility impaired and children, so alternatively provide a continuous 2m footpath for the full length of the cul-de-sac.
2. The internal roads are to be designed as a self-policing 20mph road with better use of horizontal deflection, rather than vertical deflection. Typically the speed reducing features to be at a maximum of 75m centres.
3. The minimum internal single garage size to be 6x3m and this includes integral garages.
4. The Joint Lancashire Structure Plan "Car Parking Standards" page 5 recommends the minimum internal dimension for all single garages to be a minimum of 6x3m and page 17 clause F.4.3 states "Individual garages, of minimum dimensions of 6x3m, count as one parking space. The Joint Lancashire Structure Plan "SPG access and parking" page 29 also states for residential parking "A garage is counted as one parking space. Where constructed garages should have minimum dimensions of 6 x 3 metres". Where garages are smaller than the recommended minimum internal dimension of 6 x 3m they should not be counted as a parking space and the applicant should provide an additional parking space for each garage affected.
8. A 6m manoeuvring space is recommended from all private drives onto the adoptable highway, to ensure vehicles are not overhanging the opposite footpath or causing damage to other vehicles and property, alternatively widen the parking bays to 3.2m to allow turning within the bay.
10. The off-road footpaths to be a minimum of 3m wide (best practice now indicates 3.5m) shared surface cycle paths to aid social inclusion and the promotion of sustainable forms of transport. Barriers are required to slow cyclist where the off-road cycle routes join the main highway.

11. The private drives to have a minimum width of 3.2m where they are used for vehicular access and pedestrian access to the property. From Approved Document M (Access to and use of buildings). Clause 6.15-b and 6.17-a require flights with unobstructed widths of at least 900mm.

12. Under part M of the Approved Documents a level access is required into new properties and generally a mobility ramp is associated with the level access. Ensure the mobility ramp and level access does not encroach into the manoeuvring area for the parking bays, the parking bays, the existing adopted highway or the new adoptable highway.

13. Where the private drives are sandwiched between walls and fences, it is recommended that the drives are to have a minimum clear width of 3.0m, to provide additional room to open the doors. The recommended width of 3m is based on the width of a large family car (Ford Mondeo Estate 2.09m wide), clearance at the passenger side to the garage (200mm), clearance at the drive side of the car and the garage (700mm), with room to open car door for less able bodied.

14. Where any paired parking bays are adjacent to walls and fences, it is recommended that the drives have a minimum clear width of 2.6m, to provide additional room to open the doors.

15. I recommend the local planning authority attaches a planning condition requiring an agreement between the applicant and the local highway authority under Section 38 of the Highways Act 1980 or the constitution and details of a Private Management and Maintenance Company confirming funding, management and maintenance regimes

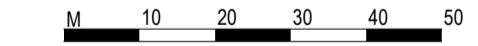
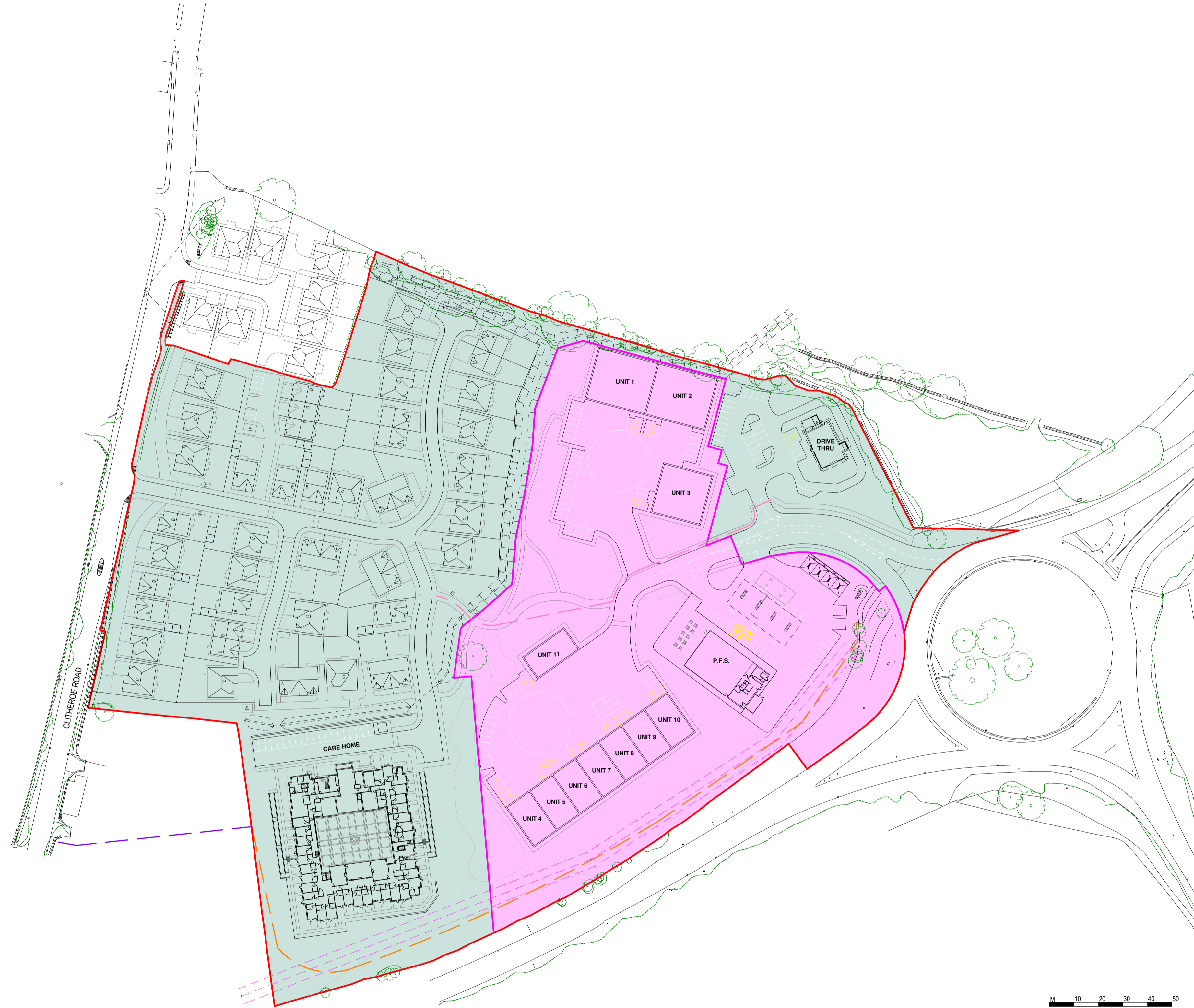
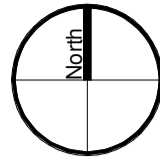
Reason: - To ensure that the estate streets serving the development are completed and thereafter maintained to an acceptable standard in the interest of residential / highway safety; to ensure a satisfactory appearance to the highways infrastructure serving the development; and to safeguard the visual amenities of the locality and users of the highway.

Yours sincerely



Neil Stevens
Highways Development Control Manager

Appendix B – Proposed Site Masterplan and Hybrid Application Plan



Notes
 The Contractor is to check all dimensions and conditions on site before commencing. Do not scale from this drawing.
 This drawing remains the copyright of POZZONI Architecture Ltd.

Scale Bars: TO BE USED ONLY AS GUIDANCE

1:100	mm	0	1000	2000	3000	4000
1:200	mm	0	1000	2000	3000	4000
1:500	m	0	10	20	30	40
1:1250	m	0	10	20	30	40

KEYPLAN

- HYBRID KEY**
- Site Boundary
 - Hybrid Boundary
 - Area of Full Application
 - Area of Outline Application
- FOOTPATH KEY**
- Proposed Public Footpath
 - Proposed Temporary Footpath
- to serve Drive Thru until completion of Outline Phase

Rev	Description	By	Date
B	Line of temporary footpath amended. Phase boundary amended to reflect revised temporary footpath route.		03.12.20
A	Full / Outlined boundaries amended to suit revised highways layout.	JW	24.07.20

Client: Maple Grove Developments Ltd, Applethwaite Ltd and Eric Wright Health & Care

Job: A59, Whalley

Drawing: Planning - Hybrid Application Plan

Factor: P5035_1150 Ref: B

Date: Jun 19 Scale: 1 : 1000 @ A1

AM	JW	JW
Planning	Tender	Construction
Design	Contract	As Built



10-12 Emerald Street
 London
 WC1N 3QA

Woodville House
 2 Woodville Road
 Altrincham
 WA14 2FH

+44 20 7078 0079
 architects@pozzoni.co.uk

+44 161 928 7848
 www.pozzoni.co.uk



Notes
 The Contractor is to check all dimensions and conditions on site before commencing. Do not scale from this drawing.
 This drawing remains the copyright of POZZONI Architecture Ltd.

Scale Bars TO BE USED ONLY AS GUIDANCE

1:100	mm	0	1000	2000	3000
1:200	mm	0	1000	2000	3000
1:500	M	0	10	20	30
1:1000	M	0	10	20	30

ACCOMMODATION SCHEDULE

Residential bungalows:
 Type A – 16no.
 772 sqft, 2 bed semi detached
 Type B – 8no.
 900 sqft, 2 bed detached
 Type C – 18no.
 1,107 sqft, 3 bed detached
 Type D – 5no.
 620 sqft, 1 bed
Total 48 units

Drive Thru: 1,830 sqft
Employment Unit 1-2: 5,540 sqft
Employment Unit 3: 4,305 sqft
Employment Units 4-10: 2,250 sqft
Employment Units 11: 2,150 sqft

TOTAL EMPLOYMENT: 33,285 sqft
Care Home: 64 Bed

LANDSCAPE KEY

- Site Boundary
- Existing Public Footpath
- Proposed Public Footpath
- - - Indicative line of temporary footpath - to serve Drive Thru until completion of Outline Phase
- - - Indicative line of Acoustic Fencing / Barrier to A59 frontage.

HARD LANDSCAPING

- 6.0m Spine Road (Commercial)
- 4.8m Spine Road (Residential)
- Shared Vehicle / Pedestrian Access Road & Parking
- Building Perimeter Paving and Footpaths
- Amenity Paths

SOFT LANDSCAPING

- Existing Tree to be Retained
- Proposed Trees
- Private Gardens with hedge / fence delineation
- Proposed Drainage Swale

All landscaping is indicative only. Refer to Trevor Bridge Associates drawings for final details.
 Landscape Structure Plan Ref: 6056.01
 Landscape Proposal Plans Ref: 6056.02 & 03

HIGHWAYS
 Internal roads will not be for adoption.

4	Temporary footpath line amended. Highways layout amended. Additional tree planting added to A59 frontage. Acoustic Fencing / Barrier added to rear of Care Home.	JW	30.11.20
3	Minor amendments to kerb lines around new roundabout arm	JW	10.08.20
2	Roundabout access amended to suit revised Highways Design. Bin Stores relocated adjacent Clitheroe Road	JW	21.07.20
1	Masterplan updated to suit Client and Highways comments	AMH	17.04.20
Rev	Description	By	Date
Client	Maple Grove Developments Ltd, Applethwaite Ltd and Eric Wright Health & Care		

Job: A59, Whalley

Drawing: Planning - Illustrative Masterplan - Option 2

Ref: P5035_SK002 Rev: 4

5035-PAL-XX-DR-A-SK002 @ A1

Date	10/02/20	Scale	1 : 1000
Author	AM	Checked	AMH
Approved	JW	Phase	Planning
Design	Contract	Construction	As Built



10-12 Emerald Street
 London WC1N 3QA
 +44 20 7078 0079
 architects@pozzoni.co.uk

Woodville House
 2 Woodville Road
 Altrincham WA14 2FH
 +44 161 928 7848
 www.pozzoni.co.uk

FOR COMMENT

Appendix C – Road Safety Audit

A59/A672 WHALLEY, CLITHEROE PROPOSED 4TH ARM OFF EXISTING ROUNDABOUT

STAGE 1 ROAD SAFETY AUDIT

610/2020/135/01

20 July 2020

six:TEN Highways & Traffic Ltd
Unit 17 Lea Green Business Park
Eurolink, St Helens
Merseyside
WA9 4TR

t 0151 424 7680
m 07985 283074
e contact@610traffic.co.uk
www.610traffic.co.uk

Rev:	Issue Status:	Prepared by/Date:	Checked by/Date:	Approved by/Date:
0	DRAFT	Jon Preston 18 July 2020	Tristan Brooks 18 July 2020	
1	FINAL	Jon Preston 20 July 2020	Tristan Brooks 20 July 2020	Jon Preston 20 July 2020

Report Title:	Stage 1 Road Safety Audit of Proposed 4 th Arm off A59/A671 Roundabout, Whalley, Clitheroe
Date:	20 July 2020
Document Reference & Revision:	610/2020/135/01 Rev 1
Prepared by:	Six Ten Highways & Traffic Ltd
On behalf of:	Vectos

Disclaimer note

The client has confirmed that it is entering into the agreement under which this report is being prepared on its own behalf and not on behalf of, or for the benefit of any other party and has agreed that in any event of any claim arising out of or in connection with that agreement and/or the report itself it shall be entitled to recover from six:TEN Highways & Traffic Limited only the losses, if any, it has itself suffered.

This report therefore is for the private and confidential use of the client for whom it was prepared solely for the purposes requested by the client. It should not be reproduced in whole or in part or relied upon by any third party for any use whatsoever without the express written authority of six:TEN Highways & Traffic Limited.

CONTENTS

1.0	INTRODUCTION	2
2.0	PROPOSALS	2
3.0	PERSONAL INJURY COLLISION DATA	3
4.0	TRAFFIC FLOW AND SPEED DATA	3

AUDITOR'S EVALUATION

5.0	ITEMS RAISED AT THIS STAGE 1 ROAD SAFETY AUDIT	4
-----	--	---

APPENDICES

APPENDIX ONE

6.0	ROAD SAFETY AUDIT TEAM STATEMENT	5
-----	----------------------------------	---

APPENDIX TWO

7.0	LIST OF DRAWINGS AND DOCUMENTS PROVIDED TO THE AUDIT TEAM	6
-----	---	---

APPENDIX THREE

8.0	PROBLEM LOCATION PLAN	7
-----	-----------------------	---

APPENDIX FOUR

9.0	PHOTOGRAPHS	8
-----	-------------	---

APPENDIX FIVE

10.0	PERSONAL INJURY COLLISION LOCATION PLAN	9
------	---	---

APPENDIX FIVE

11.0	TRAFFIC FLOW DATA	10
------	-------------------	----

1.0 INTRODUCTION

- 1.1 This report is a preliminary design Stage 1 Road Safety Audit (RSA) carried out on the proposed 4th arm off the existing roundabout at the A59/A671, Whalley, Clitheroe, at the request of Vectos, who are the Design Organisation and supplied the audit brief. The local highway authority is Lancashire County Council, who have approved the audit team to carry out RSAs on their road network.
- 1.2 The RSA team, staff members from six:TEN Highways & Traffic Ltd, present at the RSA were:
- Jon Preston MCIHT MSoRSA
Audit Team Leader
- Tristan Brooks Bsc (Hons), MBA, CMILT, MCIHT, MSoRSA, HE RSA Cert of Comp
Audit Team Member
- 1.3 We confirm that no member of the Audit Team has been involved with the design process
- 1.4 A site visit was carried out on the 9th July 2020 between the hours of 14:30 and 15:00. The weather during the site visit was overcast and the road surface was dry.
- 1.5 The RSA brief issued to the team comprised various elements listed at Appendix Two.
- 1.6 The terms of reference of the RSA are as described in the Design Manual for Roads and Bridges GG119 – Road Safety Audit. The RSA team has examined and reported only the road safety issues of the scheme as presented and has not examined or verified the compliance of the design to any other criteria.
- 1.7 A plan showing the location of road safety problems raised in this report is included at Appendix Three.

2.0 PROPOSALS

The proposed highway works involve the following:

- Provision of a 4th arm off the existing A59/A671 roundabout to provide access to a petrol filling station, drive-thru restaurant and employment development;
- Realignment of the A59 north-eastbound approach to the roundabout; and
- Provision of a paved footway linking the development to the A671 to the east via the northern section of the roundabout.

3.0 PERSONAL INJURY COLLISION DATA

- 3.1 Personal injury collision data for the five-year period (2014-2018) was provided with the audit brief by way of the Transport Assessment. The location plan is shown at Appendix Five.
- 3.2 There have been four recorded personal injury collisions on the A59/A671 roundabout during the five-year period.
- 3.3 All four collisions were classed as slight in severity.
- 3.4 One collision involved a cyclist in collision with a car, one involved a motorcyclist in collision with a car and the remaining two were collisions between two cars.

4.0 TRAFFIC FLOW AND SPEED DATA

- 4.1 Existing and forecast traffic flow data was provided to the audit team by way of the Transport Assessment, and the 2024 With Development flows are shown at Appendix Six.
- 4.2 Traffic speed data was not provided to audit team, however, during the site visit observed traffic speeds were considered to be moderate through the junction.

5.0 ITEMS RAISED AT THIS (STAGE 1) ROAD SAFETY AUDIT

5.1 Location: A59 north-eastbound and new access road approaches to the roundabout

Problem

Summary: Right-turn road marking arrows on approach to roundabout may result in drivers turning right onto the circulatory carriageway

The drawings show proposed right-turn road marking arrows on the A59 north-eastbound and new access road approaches to the roundabout. These arrows could increase the risk of head-on collisions on the roundabout as drivers may turn right onto the circulatory carriageway of the roundabout towards oncoming vehicles circulating the roundabout.

Recommendation

The arrows in the offside lanes of these approaches should be amended to ahead only arrows.

5.2 Location: A59 north-eastbound and new access road approaches to the roundabout

Problem

Summary: Larger vehicles encroach into adjacent traffic lanes

The swept path analysis drawings provided for audit show larger vehicles encroaching slightly into the adjacent traffic lanes on the A59 north-eastbound and new access road approaches to the roundabout. This may increase the risk of side swipe collisions on these approaches.

Recommendation

The proposed layout should be amended to ensure larger vehicles do not encroach into the adjacent traffic lanes on the approaches to the roundabout.

5.3 Location: New access road approach to the roundabout

Problem

Summary: Uphill gradient may result in HGVs entering the roundabout at reduced speeds

During the site visit it was observed that the proposed development site appeared to be at a lower level than the existing roundabout. This may result in an uphill gradient on the new access road approach to the roundabout. An uphill gradient may result in HGVs entering the roundabout at reduced speeds, which may increase the risk of collisions with vehicles circulating the roundabout at higher speeds.

Recommendation

The design of the new access road should allow for a length of level gradient at the roundabout to ensure HGVs are not entering the roundabout from an uphill gradient.

APPENDIX ONE

6.0 ROAD SAFETY AUDIT TEAM STATEMENT

We certify that the audit has been carried out in accordance with the requirements set out in DMRB GG119.

AUDIT TEAM LEADER

Jon Preston MCIHT MSoRSA

Director

six:TEN Highways & Traffic Ltd

Signed:



Date: 20 July 2020

AUDIT TEAM MEMBER

Tristan Brooks Bsc (Hons), MBA, CMILT, MCIHT, MSoRSA, HE RSA Cert of Comp

Traffic & Road Safety Engineer

six:TEN Highways & Traffic Ltd

Signed:



Date: 20 July 2020

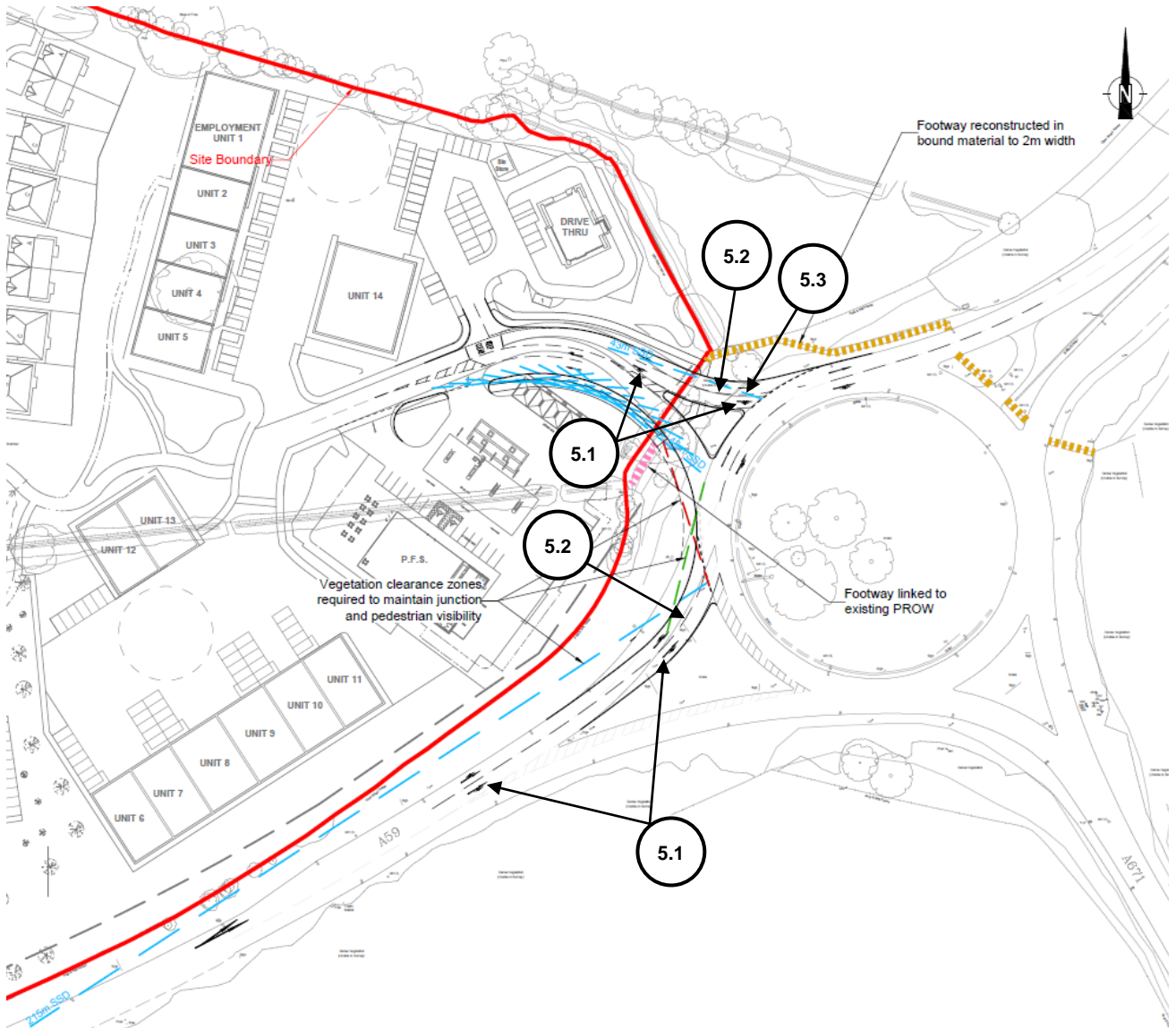
APPENDIX TWO

7.0 LIST OF DRAWINGS AND DOCUMENTS PROVIDED WITH THE AUDIT BRIEF

- 40390-SK001 E General Arrangement
- 40390-SK001-SPA Swept Path Analysis (4 sheets)
- 40390-SK001-GEO Geometric Check
- VN91274 Transport Assessment Issue 2
- VN91274 Transport Assessment Addendum Note
- Existing and Forecast Traffic Flow Data (taken from the Transport Assessment)
- Five-year Personal Injury Collision Data (taken from the Transport Assessment)

APPENDIX THREE

8.0 PROBLEM LOCATION PLAN



NOTE: THE PROPERTY OF THIS DRAWING AND DESIGN IS VICTOS (NORTH) LTD. IT MUST NOT BE COPIED OR REPRODUCED IN ANY WAY WITHOUT THEIR PRIOR WRITTEN CONSENT.

APPENDIX FOUR

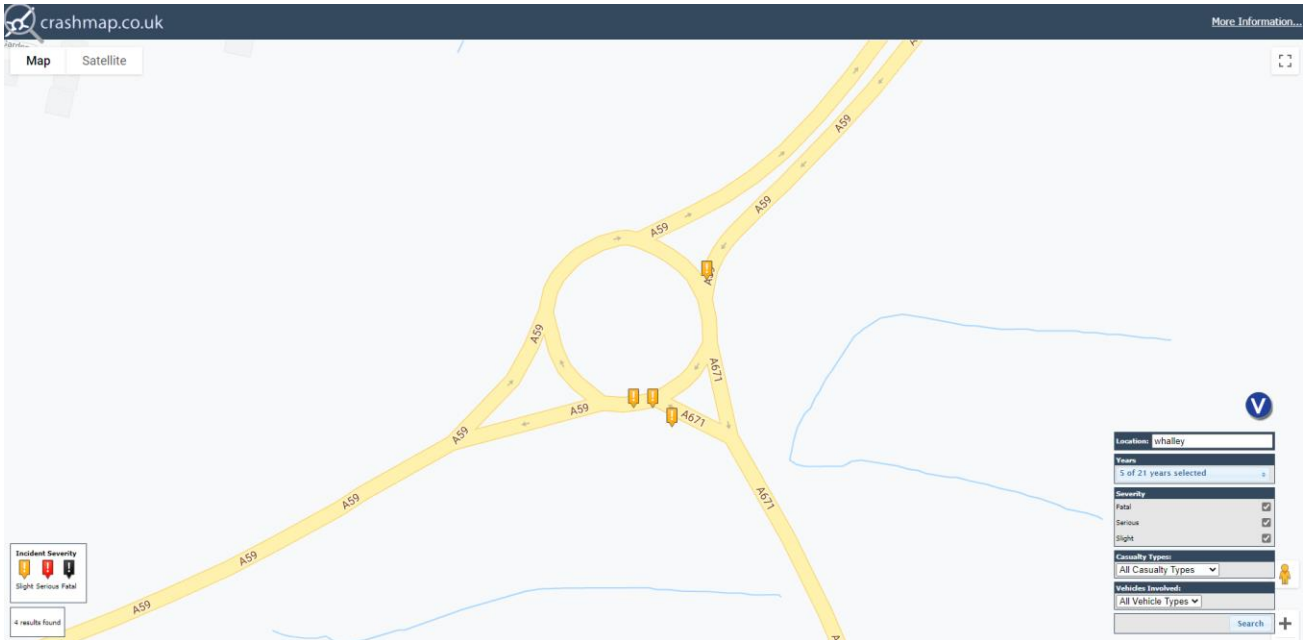
9.0 PHOTOGRAPHS



9.1 Existing north-eastbound approach to the roundabout looking towards proposed 4th arm

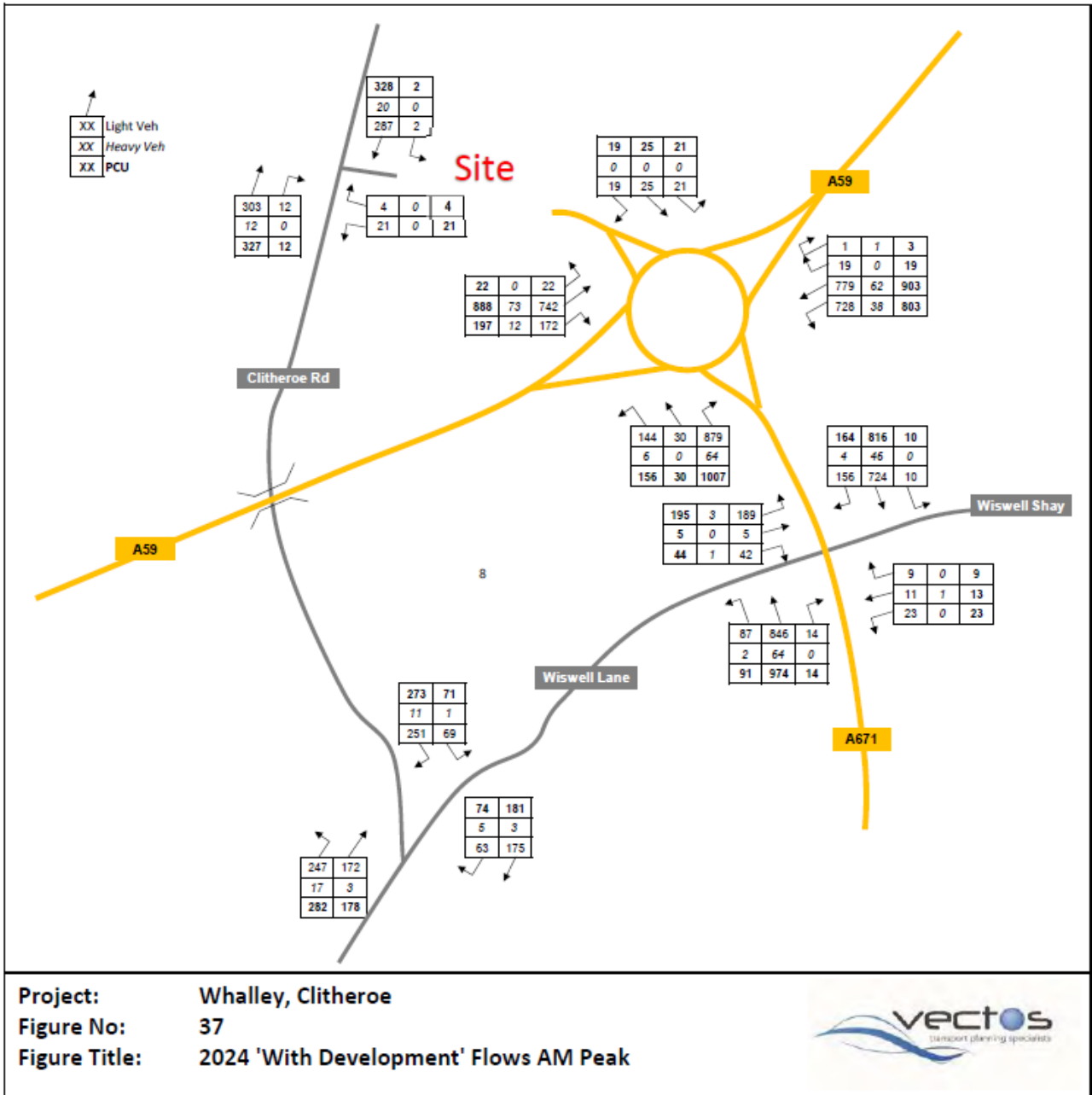
APPENDIX FIVE

10.0 PERSONAL INJURY COLLISION LOCATION PLAN

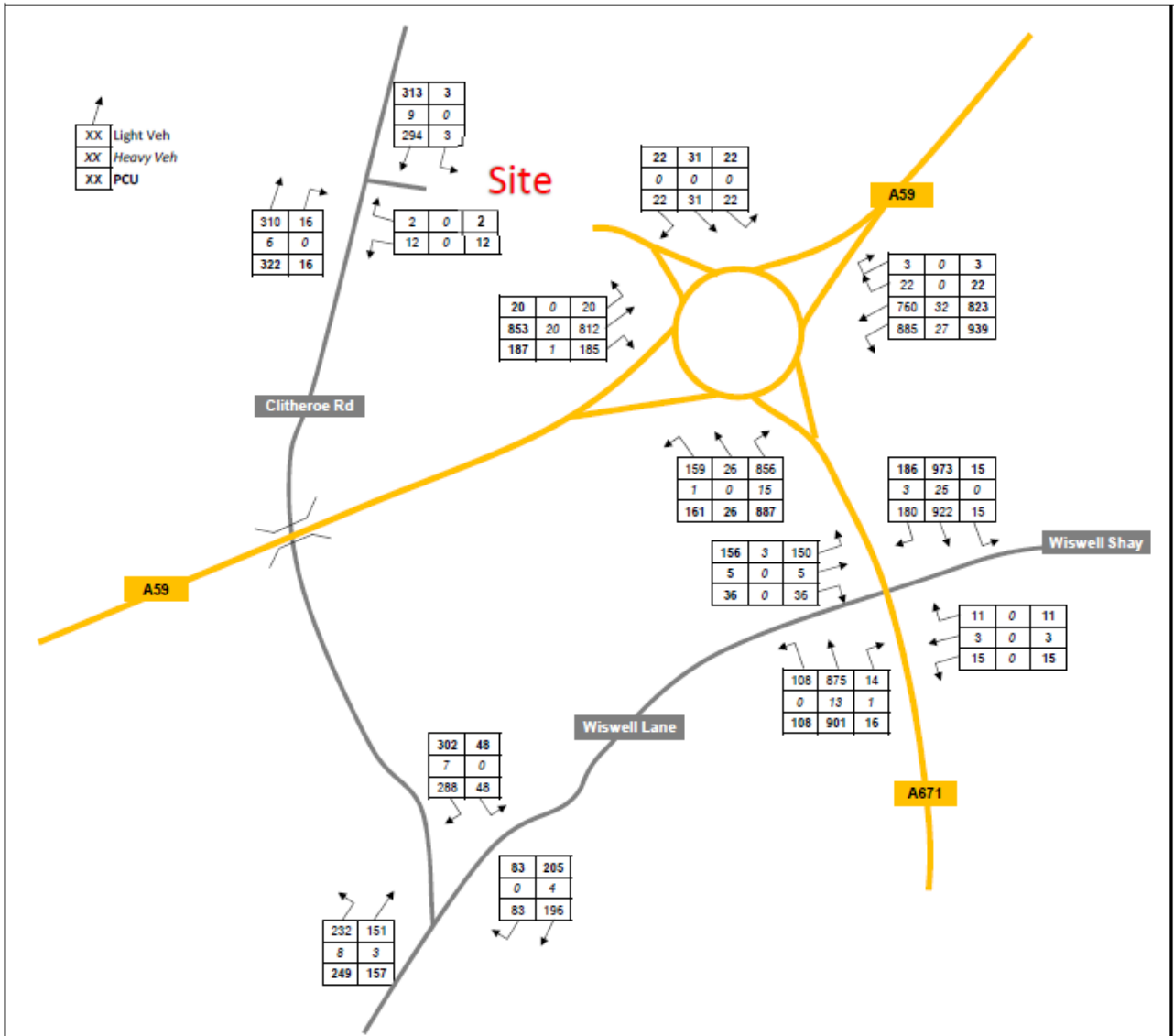


APPENDIX SIX

11.0 TRAFFIC FLOW DATA



11.1 2024 With Development Flows (AM Peak)



Project: Whalley, Clitheroe
 Figure No: 38
 Figure Title: 2024 'With Development' Flows PM Peak



11.2 2024 With Development Flows (PM Peak)

Appendix D – Road Safety Audit Response

LAND AT WHALLEY, CLITHEROE

Road Safety Audit Stage 1 Response Report

VN91274

July 2020

4th Floor Oxford Place, 61 Oxford Street, Manchester M1 6EQ

Tel: 0161 228 1008 www.vectos.co.uk

Company no. 07794057

Registered address: Vectos North Limited, 4th Floor Oxford Place, 61 Oxford Street, Manchester, M1 6EQ



REPORT CONTROL

Document: Road Safety Audit Stage 1 Response Report

Project: Land at Whalley, Clitheroe

Client: Maple Grove Developments

Job Number: VN91274

File Origin: N:\Vectos Job Data\2019\VN91274 Whalley, Clitheroe\Docs\RSA\VN91274 RSA Response Report.docx

Document Checking:

Primary Author	Tom Reader	Initialled:	TR
-----------------------	------------	--------------------	----

Contributor	David Barnes	Initialled:	DB
--------------------	--------------	--------------------	----

Review By	Tom Reader	Initialled:	TR
------------------	------------	--------------------	----

Issue	Date	Status	Checked for Issue
1	28.07.20	Issue_01	TR
2			
3			
4			

CONTENTS

1	INTRODUCTION	2
1.1	Introduction	2
1.2	Key Personnel.....	2
	A59 NORTH-EASTBOUND AND NEW ACCESS ROAD APPROACHES TO THE ROUNDABOUT	3
	Problem – Right-turn road marking arrows on approach to roundabout may result in drivers turning right onto the circulatory carriageway.....	3
	Problem – Larger vehicles encroach into adjacent traffic lanes	3
	NEW ACCESS ROAD APPROACH TO THE ROUNDABOUT	4
	Problem – Uphill gradient may result in HGVs entering the roundabout at reduced speeds	4

VECTOS DRAWINGS

VN40390-SK001 F	Proposed Fourth Arm General Arrangement Drawing
VN40390-SK001/SPA 1 A	Swept Path Analysis A59 Approach
VN40390-SK001/SPA 3 A	Swept Path Analysis Access Arm Approach

APPENDICES

Appendix RSA-A	Six:TEN Stage 1 RSA Report (report no. 610/2020/135/01 Rev 1)
----------------	---

1 INTRODUCTION

1.1 Introduction

1.1.1 Six:TEN Highways and Traffic Ltd (Six:TEN) prepared a stage 1 Road Safety Audit (RSA) report following a safety audit of the proposed fourth arm off the existing A59 / A671 roundabout at Whalley, Clitheroe. The report (reference no. 610/2020/135/01 Rev 1) is dated 20th July 2020. The proposed junction design has been developed by Vectos to serve a proposed mixed-use development.

1.1.2 A copy of the stage 1 RSA report is provided at Appendix RSA-A to this report.

1.1.3 Vectos have reviewed the RSA report and this Response Report has been prepared by Vectos as designers of the proposed junction alterations, to detail how each of the issues identified in the RSA report has been or will be addressed.

1.1.4 This report will follow the structure of the Six:TEN report, outlining the problems identified by Six:TEN and detailing the response in turn. The overseeing organisation is Lancashire County Council (LCC), who are responsible for maintaining the affected junction.

1.2 Key Personnel

1.2.1 The key personnel involved in this RSA stage 1 process are detailed in Table 1.1.

Overseeing Organisation (SMBC)	Neil Stevens: Highways Development Control Manager
RSA Team (Six:TEN)	Jon Preston: Audit Team Leader Tristan Brooks: Audit Team Member
Design Organisation (Vectos)	Tom Reader: Principal Transport Planner David Barnes: Principal Engineer

Table 1.1. Key Personnel

A59 NORTH-EASTBOUND AND NEW ACCESS ROAD APPROACHES TO THE ROUNDABOUT

Problem – Right-turn road marking arrows on approach to roundabout may result in drivers turning right onto the circulatory carriageway

Issue: The drawings show proposed right-turn road marking arrows on the A59 north-eastbound and new access road approaches to the roundabout. These arrows could increase the risk of head-on collisions on the roundabout as drivers may turn right onto the circulatory carriageway of the roundabout towards oncoming vehicles circulating the roundabout.

Recommendation: The arrows in the offside lanes of these approaches should be amended to ahead only arrows.

Design Response – RSA1 Item 5.1

The straight/right arrow has been amended to ahead only arrows in line with CD 116 para 3.27. Refer to drawing **VN40390-SK001 revision F (General Arrangement)**.

Problem – Larger vehicles encroach into adjacent traffic lanes

Issue: The swept path analysis drawings provided for audit show larger vehicles encroaching slightly into the adjacent traffic lanes on the A59 north-eastbound and new access road approaches to the roundabout. This may increase the risk of side swipe collisions on these approaches.

Recommendation: The proposed layout should be amended to ensure larger vehicles do not encroach into the adjacent traffic lanes on the approaches to the roundabout.

Design Response – RSA1 Item 5.2

The existing A59 entry lanes are 3.65m wide with no flaring on entry and a 90m entry radius. The proposed alignment has been modified slightly to provide 3.65m lanes at the start of the entry radius flaring out to 4.0m width at the give-way line, to a tighter entry radius of 42m.

The site arm exit has been widened from 2 x 3.5m lanes to 2 x 4.0m lanes to accommodate the simultaneous swept paths of side by side max artic vehicles. Refer to drawing **VN40390-SK001/SPA 1 revision A** and **VN40390-SK001/SPA 3 revision A (Swept Path Analysis)**.

NEW ACCESS ROAD APPROACH TO THE ROUNDABOUT

Problem – Uphill gradient may result in HGVs entering the roundabout at reduced speeds

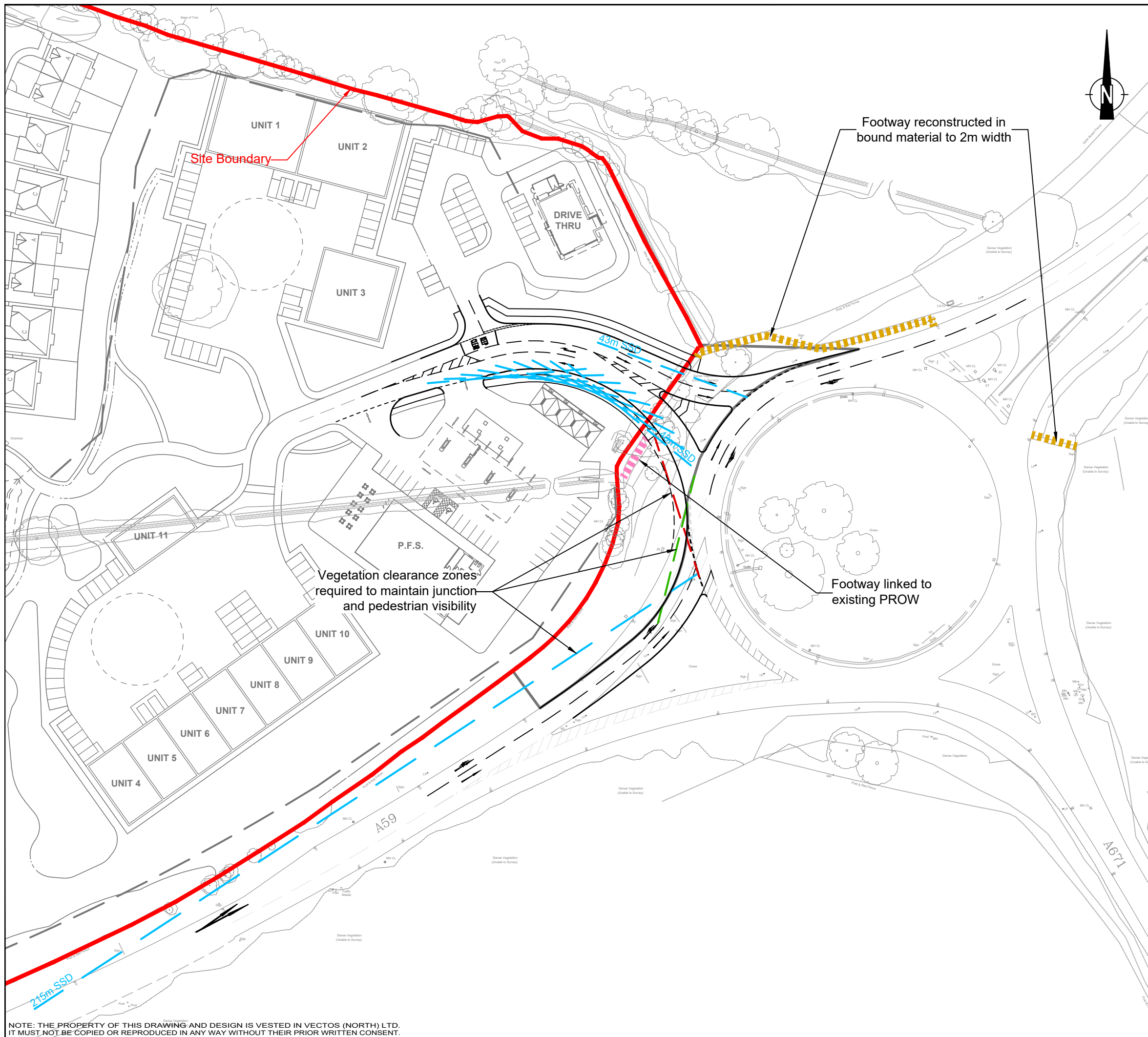
Issue: During the site visit it was observed that the proposed development site appeared to be at a lower level than the existing roundabout. This may result in an uphill gradient on the new access road approach to the roundabout. An uphill gradient may result in HGVs entering the roundabout at reduced speeds, which may increase the risk of collisions with vehicles circulating the roundabout at higher speeds.

Recommendation: The design of the new access road should allow for a length of level gradient at the roundabout to ensure HGVs are not entering the roundabout from an uphill gradient.

Design Response – RSA1 Item 5.3

Noted. The approach carriageway gradient will be a maximum 2% gradient in accordance with CD 116 para 3.32.9. In this case, with the site being lower than the development, it is anticipated that the approach will rise to the roundabout and this will be addressed at the detailed design stage.

Vectos Drawings



Notes:

-
-

F	RSA1 changes, items 5.1 & 5.2	dlb	TR	22.07.20
E	Site access entry lane widened	dlb	TR	19.06.20
D	Various amendments to review comments	dlb	TR	27.05.20
C	A59 entry and Dev access realigned	dlb	RW	24.02.20
B	Amended to suit new master plan layout	JD	RW	06.06.19
A	Lane removed from exit carriageway	JD	RW	06.12.17

REV.	DETAILS	DRAWN	CHECKED	DATE

CLIENT:
Maple Grove Developments

PROJECT:
Whalley Clitheroe

DRAWING TITLE:
Proposed 4th Arm off A59/A671 Roundabout

SCALES:
1:1000 at A3

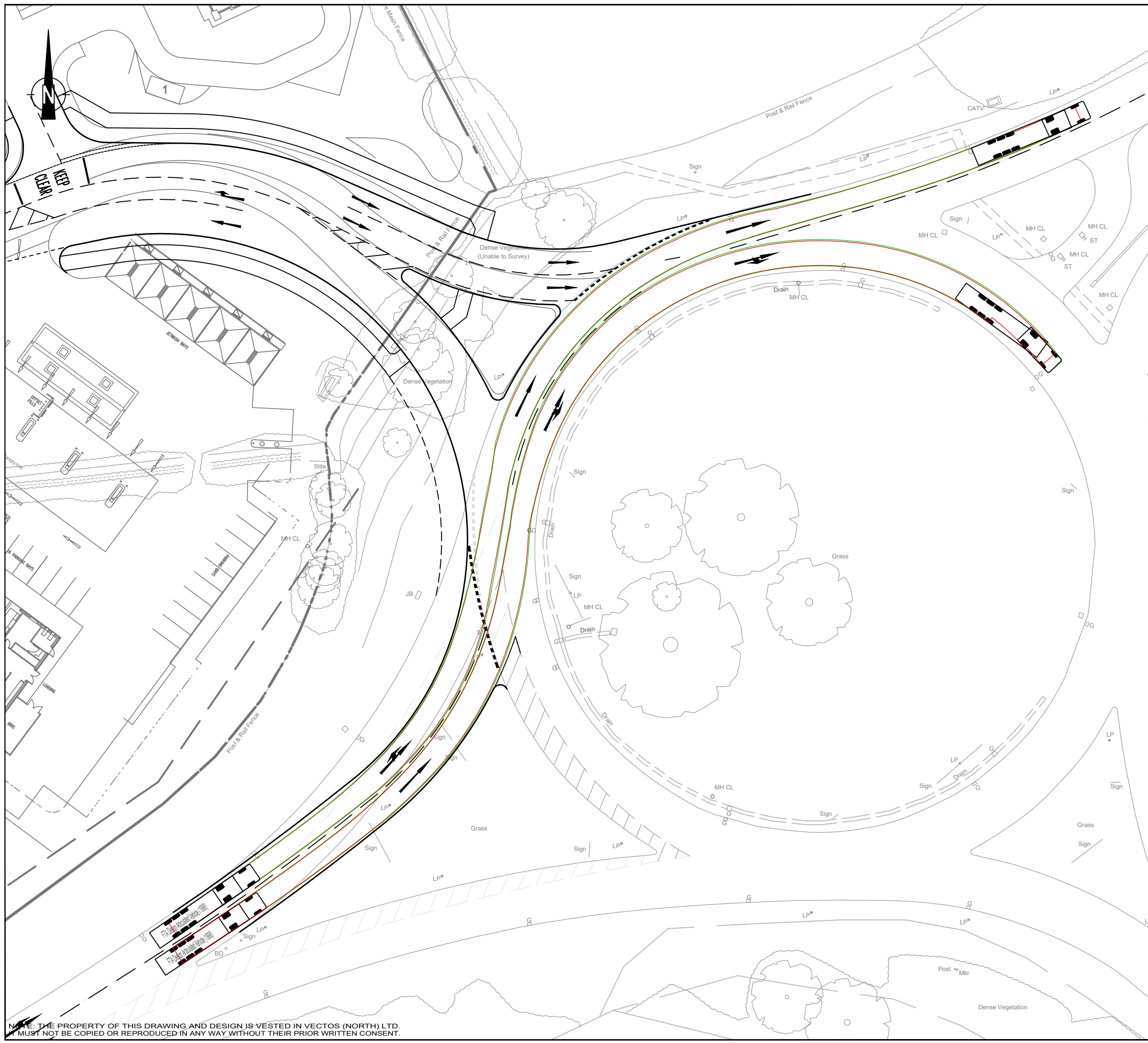
DRAWN:	AH	CHECKED:	RW	DATE:	14.10.14
--------	----	----------	----	-------	----------

vectos
 highway infrastructure specialists

Oxford Place, 61 Oxford Street, Manchester M1 6EQ
 t: 0161 228 1008 e: manchester@vectos.co.uk

DRAWING NUMBER:	VN40390-SK001	REVISION:	F
-----------------	----------------------	-----------	----------

NOTE: THE PROPERTY OF THIS DRAWING AND DESIGN IS VESTED IN VECTOS (NORTH) LTD. IT MUST NOT BE COPIED OR REPRODUCED IN ANY WAY WITHOUT THEIR PRIOR WRITTEN CONSENT.



Notes:

- 1.
- 2.

A	RSA1 change, item 5.2 - amend A59 entry	dlb	TR	22.07.20
REV.	DETAILS	DRAWN	CHECKED	DATE

CLIENT:
Maple Grove Developments

PROJECT:
Whalley Clitheroe

DRAWING TITLE:
**Proposed 4th Arm off
 A59/A671 Roundabout
 Swept Path Analysis (1)**

SCALES:
1:500 at A3

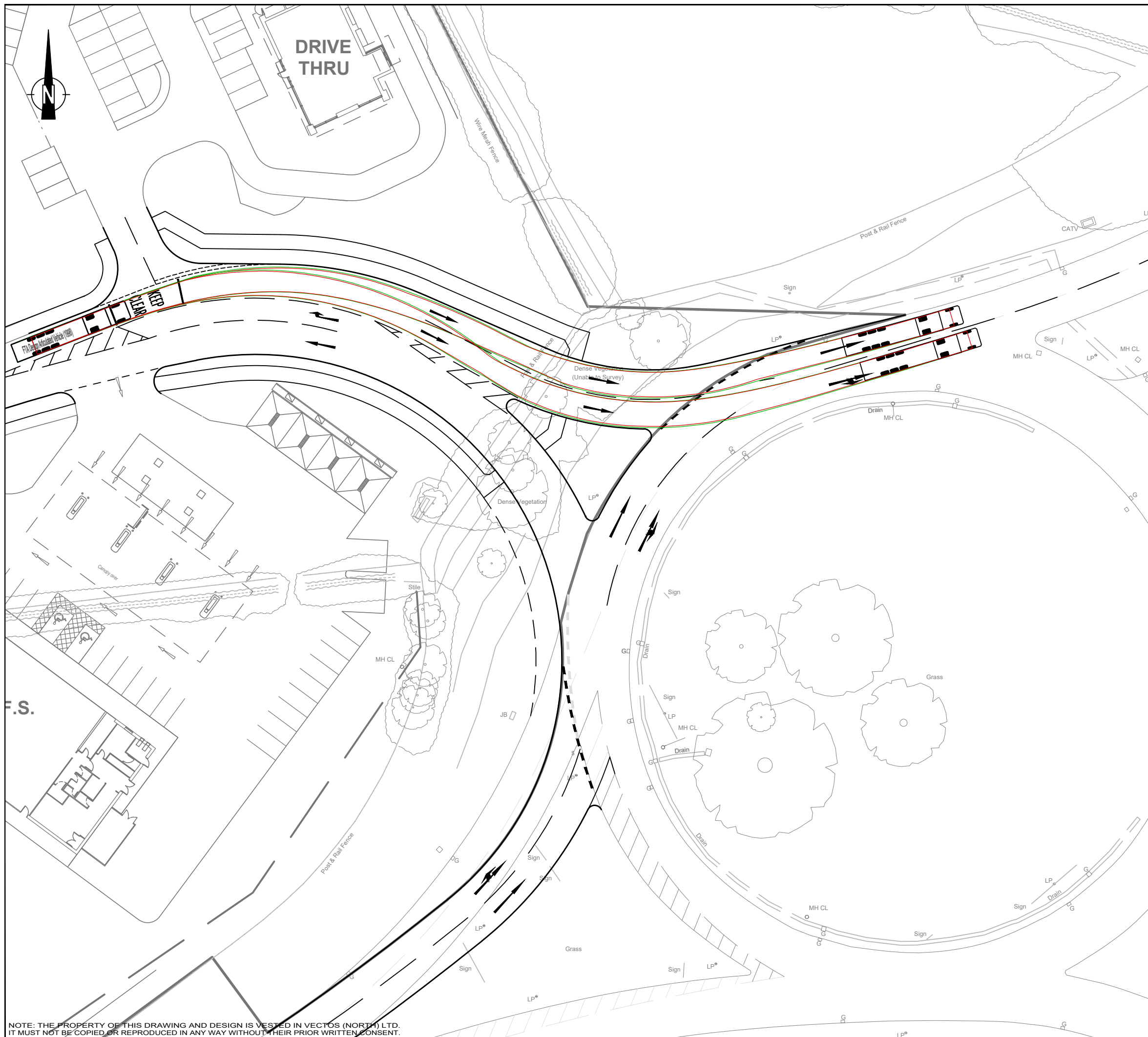
DRAWN:	DLB	CHECKED:	TR	DATE:	Feb 2020
--------	-----	----------	----	-------	----------



Oxford Place, 61 Oxford Street, Manchester M1 6EQ
 t: 0161 228 1008 e: manchester@vectos.co.uk

DRAWING NUMBER:	VN40390-SK001/SPA-1	REVISION:	A
-----------------	---------------------	-----------	---

NOTE: THE PROPERTY OF THIS DRAWING AND DESIGN IS VESTED IN VECTOS (NORTH) LTD.
 IT MUST NOT BE COPIED OR REPRODUCED IN ANY WAY WITHOUT THEIR PRIOR WRITTEN CONSENT.



Notes:

- 1.
- 2.

A	RSA1 change, item 5.2 - site entry widened	dlb	TR	22.07.20
REV.	DETAILS	DRAWN	CHECKED	DATE

CLIENT:
Maple Grove Developments

PROJECT:
Whalley Clitheroe

DRAWING TITLE:
**Proposed 4th Arm off
 A59/A671 Roundabout
 Swept Path Analysis (3)**

SCALES:
1:500 at A3

DRAWN:	DLB	CHECKED:	TR	DATE:	Feb 2020
--------	-----	----------	----	-------	----------



Oxford Place, 61 Oxford Street, Manchester M1 6EQ
 t: 0161 228 1008 e: manchester@vectos.co.uk

DRAWING NUMBER:	VN40390-SK001/SPA-3	REVISION:	A
-----------------	---------------------	-----------	---

NOTE: THE PROPERTY OF THIS DRAWING AND DESIGN IS VESTED IN VECTOS (NORTH) LTD. IT MUST NOT BE COPIED OR REPRODUCED IN ANY WAY WITHOUT THEIR PRIOR WRITTEN CONSENT.

Appendix E – TRICS Report Drive Thru

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 06 - HOTEL, FOOD & DRINK
 Category : J - DRIVE THROUGH COFFEE SHOP
 VEHICLES

Selected regions and areas:

06 WEST MIDLANDS
 WK WARWICKSHIRE 1 days

Secondary Filtering selection:

Parameter: Gross floor area
 Actual Range: 420 to 420 (units: sqm)
 Range Selected by User: 125 to 420 (units: sqm)

Parking Spaces Range: All Surveys Included

Public Transport Provision:

Selection by: Include all surveys

Date Range: 01/01/11 to 25/09/19

Selected survey days:

Wednesday 1 days

Selected survey types:

Manual count 1 days
 Directional ATC Count 0 days

Selected Locations:

Free Standing (PPS6 Out of Town) 1

Selected Location Sub Categories:

Out of Town 1

Secondary Filtering selection:

Use Class:

A3 1 days

Population within 1 mile:

10,001 to 15,000 1 days

Population within 5 miles:

250,001 to 500,000 1 days

Car ownership within 5 miles:

0.6 to 1.0 1 days

Travel Plan:

No 1 days

PTAL Rating:

No PTAL Present 1 days

LIST OF SITES relevant to selection parameters

1	WK-06-J-01	STARBUCKS	WARWICKSHIRE
	A46 WARWICK BY PASS		
	NEAR WARWICK		
	BUDBROOKE SERVICES		
	Free Standing (PPS6 Out of Town)		
	Out of Town		
	Total Gross floor area:	420 sqm	
	<i>Survey date: WEDNESDAY</i>	<i>25/09/19</i>	<i>Survey Type: MANUAL</i>

TRIP RATE for Land Use 06 - HOTEL, FOOD & DRINK/J - DRIVE THROUGH COFFEE SHOP
VEHICLES

Calculation factor: 100 sqm

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00	1	420	7.143	1	420	5.238	1	420	12.381
07:00 - 08:00	1	420	9.524	1	420	7.857	1	420	17.381
08:00 - 09:00	1	420	8.810	1	420	8.333	1	420	17.143
09:00 - 10:00	1	420	12.857	1	420	13.095	1	420	25.952
10:00 - 11:00	1	420	9.762	1	420	8.810	1	420	18.572
11:00 - 12:00	1	420	8.095	1	420	7.619	1	420	15.714
12:00 - 13:00	1	420	11.905	1	420	7.857	1	420	19.762
13:00 - 14:00	1	420	9.524	1	420	10.476	1	420	20.000
14:00 - 15:00	1	420	5.000	1	420	6.190	1	420	11.190
15:00 - 16:00	1	420	9.524	1	420	10.000	1	420	19.524
16:00 - 17:00	1	420	9.524	1	420	9.762	1	420	19.286
17:00 - 18:00	1	420	7.381	1	420	10.000	1	420	17.381
18:00 - 19:00	1	420	5.238	1	420	5.000	1	420	10.238
19:00 - 20:00	1	420	1.190	1	420	4.286	1	420	5.476
20:00 - 21:00	1	420	0.476	1	420	1.429	1	420	1.905
21:00 - 22:00	1	420	0.000	1	420	0.000	1	420	0.000
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			115.953			115.952			231.905

Parameter summary

Trip rate parameter range selected: 420 - 420 (units: sqm)
 Survey date date range: 01/01/11 - 25/09/19
 Number of weekdays (Monday-Friday): 1
 Number of Saturdays: 0
 Number of Sundays: 0
 Surveys automatically removed from selection: 0
 Surveys manually removed from selection: 0

Appendix F – Traffic Survey Data

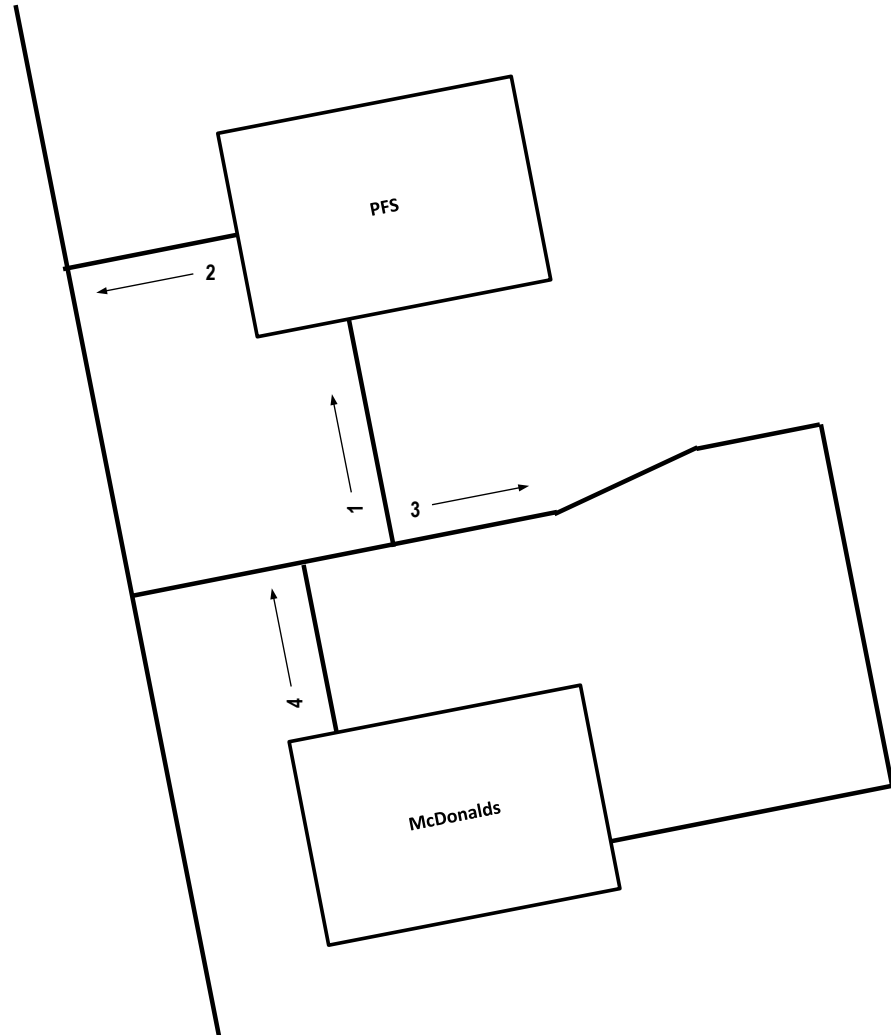
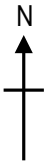
SURVEY CONTROL

Client: Vectos (North)
Client Contact: Tom Reader
Survey Location: Whalley
Date(s) of Survey: Tuesday 3rd March 2020

Notes:

On Site Supervisor: Neil Harley
Data Checking: David Cheng

Survey Reference: 2020.052 Whalley Starbucks
Status: Final
Date of Issue: 4th March 2020



DRAWING TITLE

TRAFFIC MOVEMENT REFERENCE

JOB TITLE

2020.052 WHALLEY STARBUCKS

DRAWN BY

DC

DATE

MAR 2020

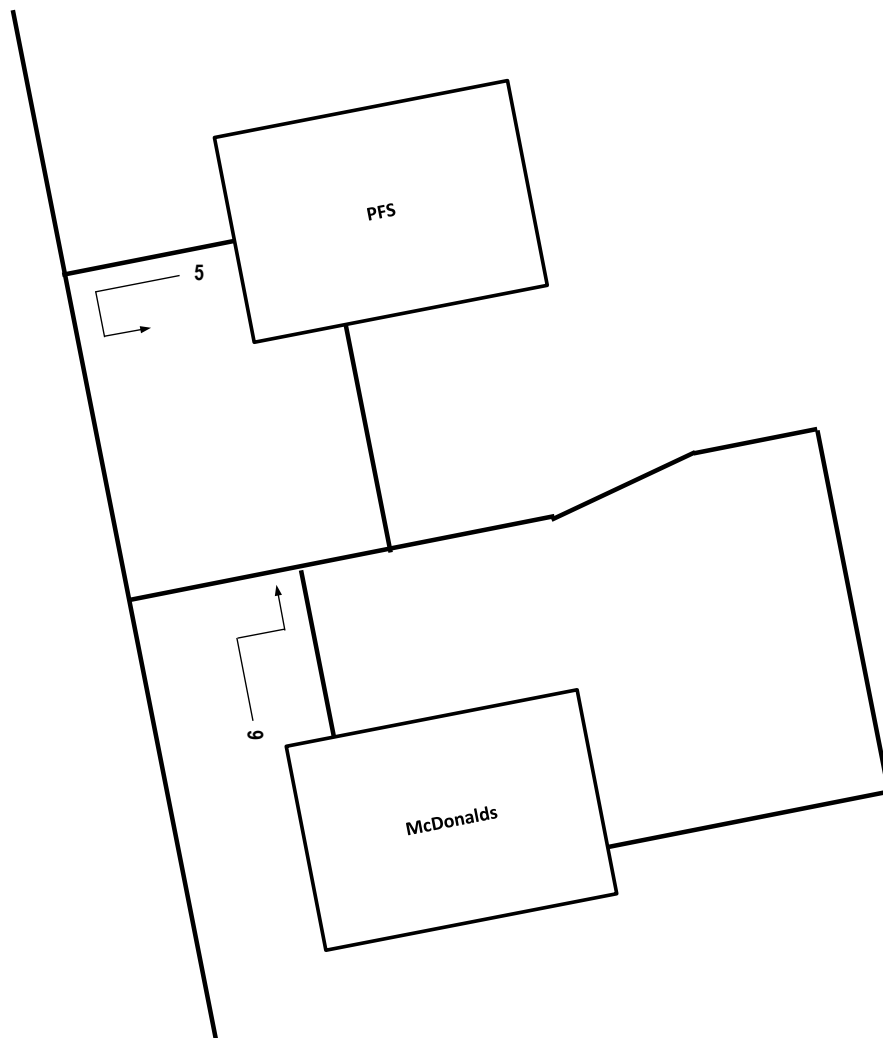
SCALE

NTS

REF

FIGURE 1

signal surveys
Traffic Counts and Car Park Surveys
Parkway House, Palatine Road, Northenden, Manchester,
M22 4DB
Tel 0161 998 4226



DRAWING TITLE

CROSS-TRIP MOVEMENT REFERENCE

JOB TITLE

2020.052 WHALLEY STARBUCKS

DRAWN BY

DC

DATE

MAR 2020

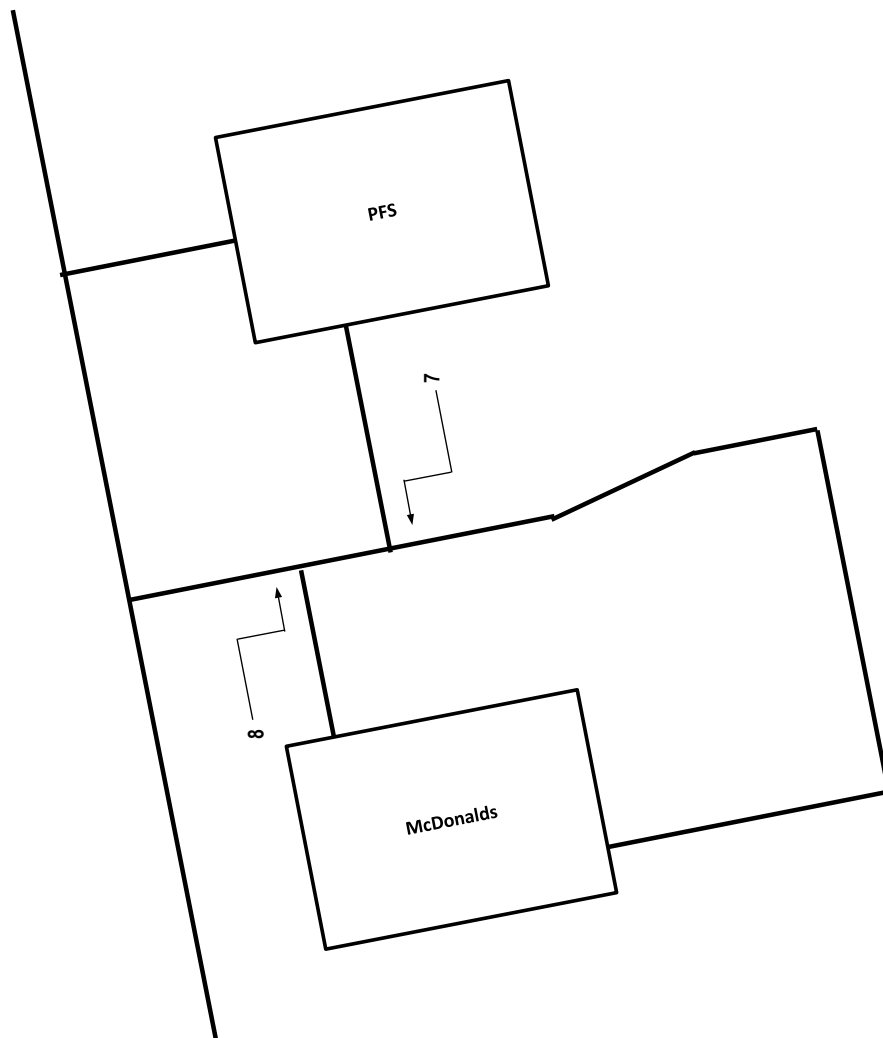
SCALE

NTS

REF

FIGURE 2

signal surveys
 Traffic Counts and Car Park Surveys
 Parkway House, Palatine Road, Northenden,
 Manchester, M22 4DB
 Tel 0161 998 4226



DRAWING TITLE

PEDESTRIAN MOVEMENT REFERENCE

JOB TITLE

2020.052 WHALLEY STARBUCKS

DRAWN BY

DC

DATE

MAR 2020

SCALE

NTS

REF

FIGURE 3

signal surveys
Traffic Counts and Car Park Surveys
Parkway House, Palatine Road, Northenden, Manchester,
M22 4DB
Tel 0161 998 4226

signal surveys

IN/OUT, PFS/McDonalds - Tuesday 3rd March 2020								
Time Beginning	1		2		3		4	
	LV	HV	LV	HV	LV	HV	LV	HV
0800	11	0	12	0	25	0	19	0
0815	15	0	21	0	21	1	20	1
0830	18	2	20	2	21	0	18	0
0845	22	1	19	0	22	0	20	0

IN/OUT, PFS/McDonalds - Tuesday 3rd March 2020								
Time Beginning	1		2		3		4	
	LV	HV	LV	HV	LV	HV	LV	HV
1700	20	1	23	1	23	0	25	0
1715	32	0	27	0	28	0	22	0
1730	35	0	38	0	26	0	30	0
1745	22	0	26	0	24	0	20	0

signal surveys

Time Beginning	Cross-Trip, PFS/McDonalds - Tuesday 3rd March 2020			
	5		6	
	LV	HV	LV	HV
0800	0	0	3	0
0815	1	0	1	0
0830	0	0	2	0
0845	1	0	2	0

Time Beginning	Cross-Trip, PFS/McDonalds - Tuesday 3rd March 2020			
	5		6	
	LV	HV	LV	HV
1700	2	0	0	0
1715	0	0	1	0
1730	0	0	2	0
1745	1	0	0	0

signal surveys

Time Beginning	Pedestrians, PFS/McDonalds - Tuesday 3rd March 2020	
	7	8
	PED	PED
0800	0	0
0815	0	0
0830	0	0
0845	1	0

Time Beginning	Pedestrians, PFS/McDonalds - Tuesday 3rd March 2020	
	7	8
	PED	PED
1700	0	1
1715	0	0
1730	0	0
1745	0	3

Appendix G – TRICS Report Employment

Calculation Reference: AUDIT-715001-200327-0318

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 02 - EMPLOYMENT
 Category : C - INDUSTRIAL UNIT
 VEHICLES

Selected regions and areas:

02	SOUTH EAST RE READING	1 days
03	SOUTH WEST BR BRISTOL CITY	1 days
04	EAST ANGLIA SF SUFFOLK	1 days
06	WEST MIDLANDS HE HEREFORDSHIRE	1 days
08	NORTH WEST LC LANCASHIRE	2 days
09	NORTH TW TYNE & WEAR	1 days

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

Primary Filtering selection:

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

Parameter: Gross floor area
 Actual Range: 150 to 1880 (units: sqm)
 Range Selected by User: 150 to 2000 (units: sqm)

Parking Spaces Range: All Surveys Included

Public Transport Provision:

Selection by: Include all surveys

Date Range: 01/01/12 to 20/06/19

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

Selected survey days:

Tuesday	3 days
Thursday	3 days
Friday	1 days

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

Selected survey types:

Manual count	7 days
Directional ATC Count	0 days

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

Selected Locations:

Suburban Area (PPS6 Out of Centre)	2
Edge of Town	5

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

Selected Location Sub Categories:

Industrial Zone	6
Commercial Zone	1

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

Secondary Filtering selection:

Use Class:

B1	5 days
B2	2 days

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

Population within 1 mile:

1,001 to 5,000	1 days
10,001 to 15,000	3 days
15,001 to 20,000	1 days
20,001 to 25,000	1 days
25,001 to 50,000	1 days

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

Population within 5 miles:

50,001 to 75,000	1 days
75,001 to 100,000	1 days
125,001 to 250,000	3 days
250,001 to 500,000	2 days

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

Car ownership within 5 miles:

0.5 or Less	1 days
0.6 to 1.0	1 days
1.1 to 1.5	5 days

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

Travel Plan:

No	7 days
----	--------

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

PTAL Rating:

No PTAL Present	7 days
-----------------	--------

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

LIST OF SITES relevant to selection parameters

1	BR-02-C-02 SOUTH LIBERTY LANE BRISTOL	STAINLESS FITTINGS	BRISTOL CITY
	Edge of Town Industrial Zone Total Gross floor area: 1475 sqm <i>Survey date: TUESDAY 22/09/15</i>		<i>Survey Type: MANUAL</i>
2	HE-02-C-02 COLLEGE ROAD HEREFORD BURCOTT	THERMAL PROCESSING	HEREFORDSHIRE
	Edge of Town Commercial Zone Total Gross floor area: 1880 sqm <i>Survey date: TUESDAY 22/10/13</i>		<i>Survey Type: MANUAL</i>
3	LC-02-C-03 GOLDEN HILL LANE LEYLAND	TIMBER SUPPLIES	LANCASHIRE
	Suburban Area (PPS6 Out of Centre) Industrial Zone Total Gross floor area: 150 sqm <i>Survey date: TUESDAY 06/11/18</i>		<i>Survey Type: MANUAL</i>
4	LC-02-C-04 CHORLEY ROAD BLACKPOOL LITTLE CARLETON	POWDER COATINGS	LANCASHIRE
	Edge of Town Industrial Zone Total Gross floor area: 1010 sqm <i>Survey date: THURSDAY 20/06/19</i>		<i>Survey Type: MANUAL</i>
5	RE-02-C-01 COMMERCIAL ROAD READING	SHEET METAL FABRICATION	READING
	Edge of Town Industrial Zone Total Gross floor area: 645 sqm <i>Survey date: THURSDAY 22/11/12</i>		<i>Survey Type: MANUAL</i>
6	SF-02-C-01 ANSON ROAD IPSWICH MARTLESHAM HEATH	JOINERY	SUFFOLK
	Edge of Town Industrial Zone Total Gross floor area: 1100 sqm <i>Survey date: FRIDAY 12/07/13</i>		<i>Survey Type: MANUAL</i>
7	TW-02-C-01 SHAFTESBURY AVENUE JARROW TYNE POINT IND. ESTATE	INDUSTRIAL UNIT	TYNE & WEAR
	Suburban Area (PPS6 Out of Centre) Industrial Zone Total Gross floor area: 950 sqm <i>Survey date: THURSDAY 15/11/12</i>		<i>Survey Type: MANUAL</i>

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

TRIP RATE for Land Use 02 - EMPLOYMENT/C - INDUSTRIAL UNIT
VEHICLES

Calculation factor: 100 sqm

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	7	1030	0.291	7	1030	0.055	7	1030	0.346
08:00 - 09:00	7	1030	0.361	7	1030	0.125	7	1030	0.486
09:00 - 10:00	7	1030	0.305	7	1030	0.180	7	1030	0.485
10:00 - 11:00	7	1030	0.264	7	1030	0.222	7	1030	0.486
11:00 - 12:00	7	1030	0.222	7	1030	0.208	7	1030	0.430
12:00 - 13:00	7	1030	0.333	7	1030	0.347	7	1030	0.680
13:00 - 14:00	7	1030	0.347	7	1030	0.264	7	1030	0.611
14:00 - 15:00	7	1030	0.347	7	1030	0.319	7	1030	0.666
15:00 - 16:00	7	1030	0.305	7	1030	0.305	7	1030	0.610
16:00 - 17:00	7	1030	0.153	7	1030	0.402	7	1030	0.555
17:00 - 18:00	7	1030	0.042	7	1030	0.541	7	1030	0.583
18:00 - 19:00	7	1030	0.097	7	1030	0.097	7	1030	0.194
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			3.067			3.065			6.132

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

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

The survey data, graphs and all associated supporting information, contained within the TRICS Database are published by TRICS Consortium Limited ("the Company") and the Company claims copyright and database rights in this published work. The Company authorises those who possess a current TRICS licence to access the TRICS Database and copy the data contained within the TRICS Database for the licence holders' use only. Any resulting copy must retain all copyrights and other proprietary notices, and any disclaimer contained thereon.

The Company accepts no responsibility for loss which may arise from reliance on data contained in the TRICS Database. [No warranty of any kind, express or implied, is made as to the data contained in the TRICS Database.]

Parameter summary

Trip rate parameter range selected:	150 - 1880 (units: sqm)
Survey date date range:	01/01/12 - 20/06/19
Number of weekdays (Monday-Friday):	7
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	0

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

TRIP RATE for Land Use 02 - EMPLOYMENT/C - INDUSTRIAL UNIT
OGVS

Calculation factor: 100 sqm

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	7	1030	0.000	7	1030	0.014	7	1030	0.014
08:00 - 09:00	7	1030	0.014	7	1030	0.000	7	1030	0.014
09:00 - 10:00	7	1030	0.028	7	1030	0.028	7	1030	0.056
10:00 - 11:00	7	1030	0.028	7	1030	0.055	7	1030	0.083
11:00 - 12:00	7	1030	0.014	7	1030	0.014	7	1030	0.028
12:00 - 13:00	7	1030	0.028	7	1030	0.042	7	1030	0.070
13:00 - 14:00	7	1030	0.028	7	1030	0.000	7	1030	0.028
14:00 - 15:00	7	1030	0.000	7	1030	0.014	7	1030	0.014
15:00 - 16:00	7	1030	0.014	7	1030	0.014	7	1030	0.028
16:00 - 17:00	7	1030	0.014	7	1030	0.014	7	1030	0.028
17:00 - 18:00	7	1030	0.000	7	1030	0.000	7	1030	0.000
18:00 - 19:00	7	1030	0.014	7	1030	0.000	7	1030	0.014
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.182			0.195			0.377

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

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

Appendix H – Distribution Information

MSOA	Code	Number	Route
Blackburn with Darwen 001	E02002615	55	West A59
Blackburn with Darwen 002	E02002616	21	West A59
Blackburn with Darwen 003	E02002617	19	West A59
Blackburn with Darwen 004	E02002618	8	West A59
Blackburn with Darwen 005	E02002619	8	West A59
Blackburn with Darwen 006	E02002620	9	West A59
Blackburn with Darwen 007	E02002621	6	West A59
Blackburn with Darwen 008	E02002622	13	West A59
Blackburn with Darwen 009	E02002623	33	West A59
Blackburn with Darwen 010	E02002624	29	West A59
Blackburn with Darwen 011	E02002625	26	A671 South
Blackburn with Darwen 012	E02002626	13	West A59
Blackburn with Darwen 013	E02002627	24	A671 South
Blackburn with Darwen 014	E02002628	10	A671 South
Blackburn with Darwen 015	E02002629	16	A671 South
Blackburn with Darwen 016	E02002630	9	A671 South
Blackburn with Darwen 017	E02002631	13	A671 South
Blackburn with Darwen 018	E02002632	17	A671 South
Blackpool 001	E02002633	1	West A59
Blackpool 002	E02002634	1	West A59
Blackpool 005	E02002637	1	West A59
Blackpool 006	E02002638	1	West A59
Blackpool 008	E02002640	1	West A59
Blackpool 009	E02002641	1	West A59
Blackpool 011	E02002643	2	West A59
Blackpool 012	E02002644	1	West A59
Blackpool 015	E02002647	1	West A59
Blackpool 019	E02002651	1	West A59
Bolton 001	E02000984	2	A671 South
Bolton 002	E02000985	1	A671 South
Bolton 005	E02000988	1	A671 South
Bolton 007	E02000990	1	West A59
Bolton 008	E02000991	1	A671 South
Bolton 009	E02000992	1	West A59
Bolton 010	E02000993	1	A671 South
Bolton 014	E02000997	1	West A59
Bolton 017	E02001000	1	A671 South
Bolton 018	E02001001	1	West A59
Bolton 019	E02001002	1	A671 South
Bolton 021	E02001004	2	West A59
Bolton 023	E02001006	1	West A59
Bolton 030	E02001013	2	West A59
Bolton 031	E02001014	4	West A59
Bradford 002	E02002184	1	North A59
Bradford 006	E02002188	1	North A59
Burnley 001	E02005176	14	A671 South
Burnley 002	E02005177	7	A671 South
Burnley 003	E02005178	9	A671 South
Burnley 004	E02005179	46	A671 South

Burnley 005	E02005180	21 A671 South
Burnley 006	E02005181	13 A671 South
Burnley 007	E02005182	16 A671 South
Burnley 008	E02005183	10 A671 South
Burnley 009	E02005184	9 A671 South
Burnley 010	E02005185	13 A671 South
Burnley 011	E02005186	19 A671 South
Burnley 014	E02006881	19 A671 South
Bury 001	E02001019	1 A671 South
Bury 002	E02001020	1 A671 South
Bury 003	E02001021	2 A671 South
Bury 006	E02001024	1 A671 South
Bury 014	E02001032	1 A671 South
Bury 016	E02001034	3 A671 South
Bury 019	E02001037	1 A671 South
Bury 023	E02001041	2 A671 South
Bury 025	E02001043	1 A671 South
Bury 026	E02001044	2 A671 South
Calderdale 004	E02002247	1 A671 South
Calderdale 013	E02002256	4 A671 South
Calderdale 022	E02002265	1 A671 South
Chorley 001	E02005189	3 West A59
Chorley 002	E02005190	5 A671 South
Chorley 003	E02005191	5 West A59
Chorley 004	E02005192	7 West A59
Chorley 005	E02005193	2 West A59
Chorley 007	E02005195	2 West A59
Chorley 008	E02005196	1 West A59
Chorley 009	E02005197	1 A671 South
Chorley 010	E02005198	2 West A59
Chorley 012	E02005200	1 West A59
Chorley 013	E02005201	1 West A59
Chorley 014	E02005202	3 West A59
Craven 001	E02005742	1 North A59
Craven 002	E02005743	1 North A59
Craven 003	E02005744	4 North A59
Fylde 002	E02005204	1 West A59
Fylde 004	E02005206	1 West A59
Fylde 005	E02005207	1 West A59
Fylde 006	E02005208	1 West A59
Fylde 007	E02005209	2 West A59
Fylde 008	E02005210	1 West A59
Fylde 009	E02005211	2 West A59
Hyndburn 001	E02005212	132 A671 South
Hyndburn 002	E02005213	70 A671 South
Hyndburn 003	E02005214	37 A671 South
Hyndburn 004	E02005215	43 A671 South
Hyndburn 005	E02005216	26 A671 South
Hyndburn 006	E02005217	23 A671 South
Hyndburn 007	E02005218	38 A671 South

Hyndburn 008	E02005219	26 A671 South
Hyndburn 009	E02005220	25 A671 South
Knowsley 001	E02001327	1 West A59
Lancaster 001	E02005221	2 West A59
Lancaster 002	E02005222	1 West A59
Lancaster 006	E02005226	1 West A59
Lancaster 008	E02005228	1 West A59
Lancaster 010	E02005230	6 West A59
Lancaster 011	E02005231	1 West A59
Lancaster 013	E02005233	1 West A59
Lancaster 014	E02005234	1 West A59
Lancaster 018	E02005238	1 West A59
Lancaster 019	E02005239	3 West A59
Lancaster 020	E02006871	1 West A59
Manchester 004	E02001048	1 A671 South
Manchester 005	E02001049	2 A671 South
Manchester 007	E02001051	1 A671 South
Manchester 008	E02001052	1 A671 South
Manchester 009	E02001053	1 A671 South
Manchester 011	E02001055	2 A671 South
Manchester 017	E02001061	3 A671 South
Manchester 019	E02001063	1 A671 South
Manchester 020	E02001064	1 A671 South
Manchester 021	E02001065	1 A671 South
Manchester 054	E02006902	1 A671 South
Manchester 058	E02006915	1 A671 South
Manchester 059	E02006916	1 A671 South
Manchester 060	E02006917	1 A671 South
Oldham 002	E02001099	1 A671 South
Oldham 017	E02001114	1 A671 South
Oldham 018	E02001115	1 A671 South
Oldham 021	E02001118	1 A671 South
Oldham 031	E02001128	1 A671 South
Oldham 033	E02001130	1 A671 South
Pendle 001	E02005240	11 North A59
Pendle 002	E02005241	4 North A59
Pendle 003	E02005242	9 North A59
Pendle 004	E02005243	5 A671 South
Pendle 005	E02005244	9 A671 South
Pendle 006	E02005245	8 A671 South
Pendle 007	E02005246	10 A671 South
Pendle 008	E02005247	29 A671 South
Pendle 009	E02005248	7 A671 South
Pendle 010	E02005249	10 A671 South
Pendle 011	E02005250	6 A671 South
Pendle 012	E02005251	8 A671 South
Pendle 013	E02005252	9 A671 South
Preston 001	E02005253	5 West A59
Preston 002	E02005254	3 West A59
Preston 003	E02005255	1 West A59

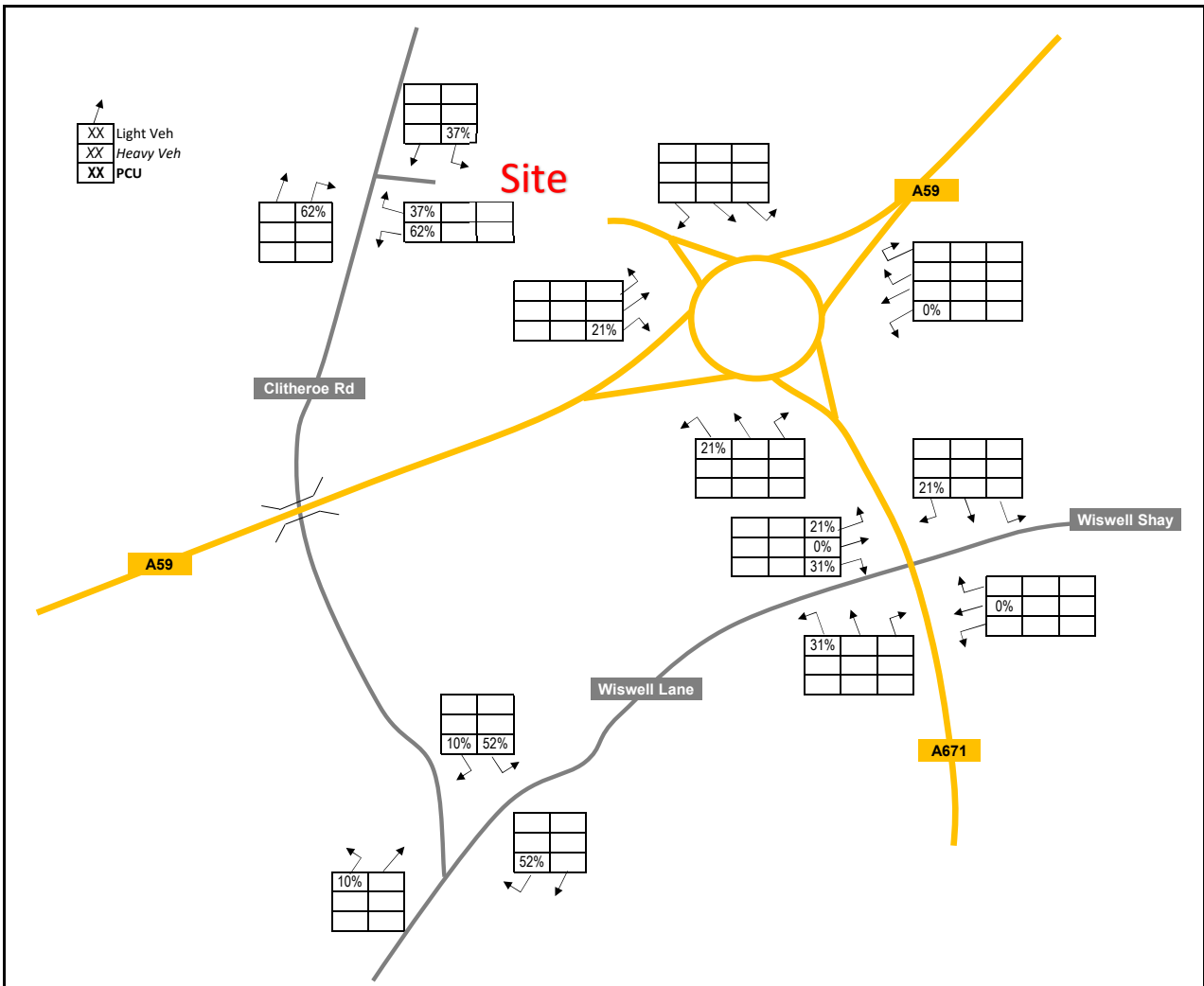
Preston 004	E02005256	11 West A59
Preston 005	E02005257	1 West A59
Preston 006	E02005258	4 West A59
Preston 007	E02005259	2 West A59
Preston 008	E02005260	1 West A59
Preston 009	E02005261	3 West A59
Preston 010	E02005262	3 West A59
Preston 011	E02005263	5 West A59
Preston 012	E02005264	3 West A59
Preston 013	E02005265	1 West A59
Preston 014	E02005266	1 West A59
Preston 015	E02005267	2 West A59
Preston 016	E02005268	2 West A59
Preston 017	E02005269	5 West A59
Ribble Valley 001	E02005270	86 North A59
Ribble Valley 002	E02005271	99 North A59
Ribble Valley 003	E02005272	126 North A59
Ribble Valley 004	E02005273	32 West A59
Ribble Valley 005	E02005274	117 A671 South
Ribble Valley 006	E02005275	20 West A59
Ribble Valley 007	E02005276	347 West A58
Ribble Valley 008	E02005277	131 West A59
Rochdale 001	E02001132	2 A671 South
Rochdale 003	E02001134	1 A671 South
Rochdale 004	E02001135	2 A671 South
Rochdale 005	E02001136	1 A671 South
Rochdale 007	E02001138	3 A671 South
Rochdale 010	E02001141	2 A671 South
Rochdale 011	E02001142	1 A671 South
Rochdale 012	E02001143	1 A671 South
Rochdale 016	E02001147	1 A671 South
Rochdale 018	E02001149	1 A671 South
Rochdale 019	E02001150	1 A671 South
Rochdale 021	E02001152	1 A671 South
Rochdale 023	E02001154	1 A671 South
Rossendale 001	E02005278	4 A671 South
Rossendale 002	E02005279	11 A671 South
Rossendale 003	E02005280	9 A671 South
Rossendale 004	E02005281	1 A671 South
Rossendale 007	E02005284	5 A671 South
Rossendale 009	E02005286	2 A671 South
Rossendale 010	E02006884	8 A671 South
Salford 002	E02001158	1 West A59
Salford 004	E02001160	2 West A59
Salford 005	E02001161	1 A671 South
Salford 009	E02001165	1 A671 South
Salford 016	E02001172	1 A671 South
Salford 020	E02001176	1 A671 South
Salford 021	E02001177	1 A671 South
Salford 022	E02001178	1 A671 South

Salford 026	E02001182	1 A671 South
Salford 027	E02001183	1 A671 South
Sefton 001	E02001429	1 West A59
Sefton 002	E02001430	2 West A59
Sefton 003	E02001431	2 West A59
Sefton 017	E02001445	1 West A59
Sefton 020	E02001448	1 West A59
South Ribble 001	E02005287	3 West A59
South Ribble 002	E02005288	2 West A59
South Ribble 003	E02005289	3 West A59
South Ribble 004	E02005290	6 West A59
South Ribble 005	E02005291	2 West A59
South Ribble 006	E02005292	3 West A59
South Ribble 007	E02005293	3 West A59
South Ribble 008	E02005294	2 West A59
South Ribble 009	E02005295	4 West A59
South Ribble 011	E02005297	4 West A59
South Ribble 012	E02005298	7 West A59
South Ribble 013	E02005299	4 West A59
South Ribble 014	E02005300	2 West A59
South Ribble 015	E02005301	4 West A59
South Ribble 016	E02005302	4 West A59
South Ribble 017	E02005303	4 West A59
St. Helens 008	E02001413	1 West A59
St. Helens 010	E02001415	1 West A59
Stockport 002	E02001188	2 A671 South
Stockport 007	E02001193	1 A671 South
Tameside 002	E02001230	2 A671 South
Tameside 005	E02001233	1 A671 South
Tameside 007	E02001235	1 A671 South
Tameside 008	E02001236	1 A671 South
Tameside 011	E02001239	1 A671 South
Tameside 016	E02001244	1 A671 South
Tameside 018	E02001246	2 A671 South
Tameside 020	E02001248	1 A671 South
Tameside 021	E02001249	1 A671 South
Tameside 025	E02001253	1 A671 South
Tameside 029	E02001257	1 A671 South
Trafford 001	E02001259	1 A671 South
Warrington 002	E02002591	1 A671 South
West Lancashire 001	E02005304	3 West A59
West Lancashire 003	E02005306	1 West A59
West Lancashire 005	E02005308	2 West A59
West Lancashire 007	E02005310	1 West A59
West Lancashire 012	E02005315	3 West A59
West Lancashire 015	E02005318	1 West A59
Wigan 002	E02001288	1 West A59
Wigan 003	E02001289	3 West A59
Wigan 006	E02001292	1 West A59
Wigan 007	E02001293	1 West A59

Wigan 008	E02001294	2 West A59
Wigan 009	E02001295	3 West A59
Wigan 014	E02001300	1 West A59
Wigan 017	E02001303	1 West A59
Wigan 018	E02001304	2 West A59
Wigan 020	E02001306	1 West A59
Wigan 021	E02001307	1 West A59
Wigan 024	E02001310	1 West A59
Wigan 025	E02001311	1 West A59
Wigan 026	E02001312	1 West A59
Wigan 028	E02001314	2 West A59
Wigan 030	E02001316	1 West A59
Wigan 033	E02001319	2 West A59
Wyre 005	E02005323	2 West A59
Wyre 006	E02005324	9 West A59
Wyre 007	E02005325	5 West A59
Wyre 009	E02005327	2 West A59
Wyre 010	E02005328	6 West A59
Wyre 011	E02005329	7 West A59
Wyre 012	E02005330	5 West A59
Wyre 013	E02005331	2 West A59
Wyre 014	E02005332	1 West A59

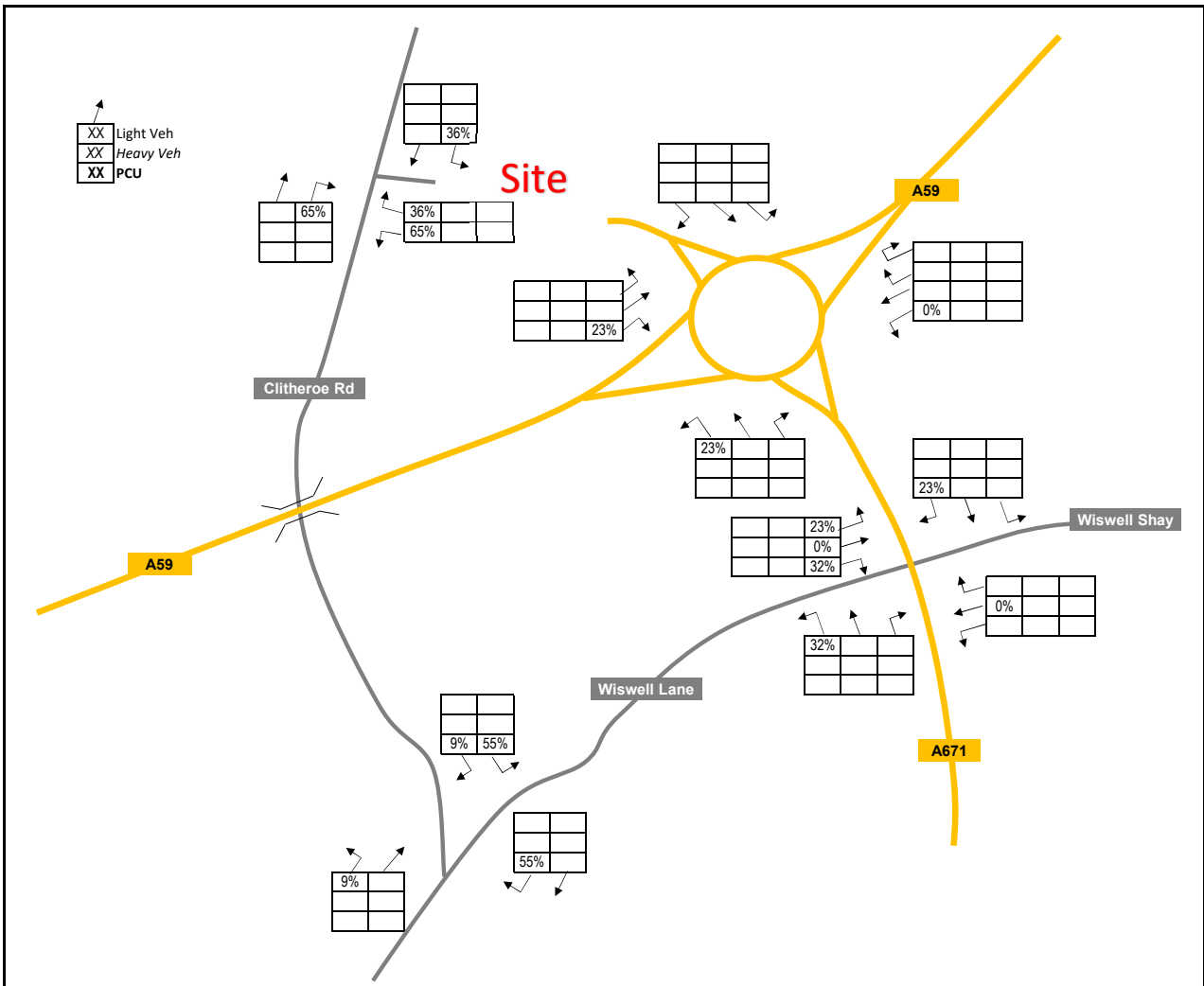
2456

Appendix I – Revised Traffic Flow Figures



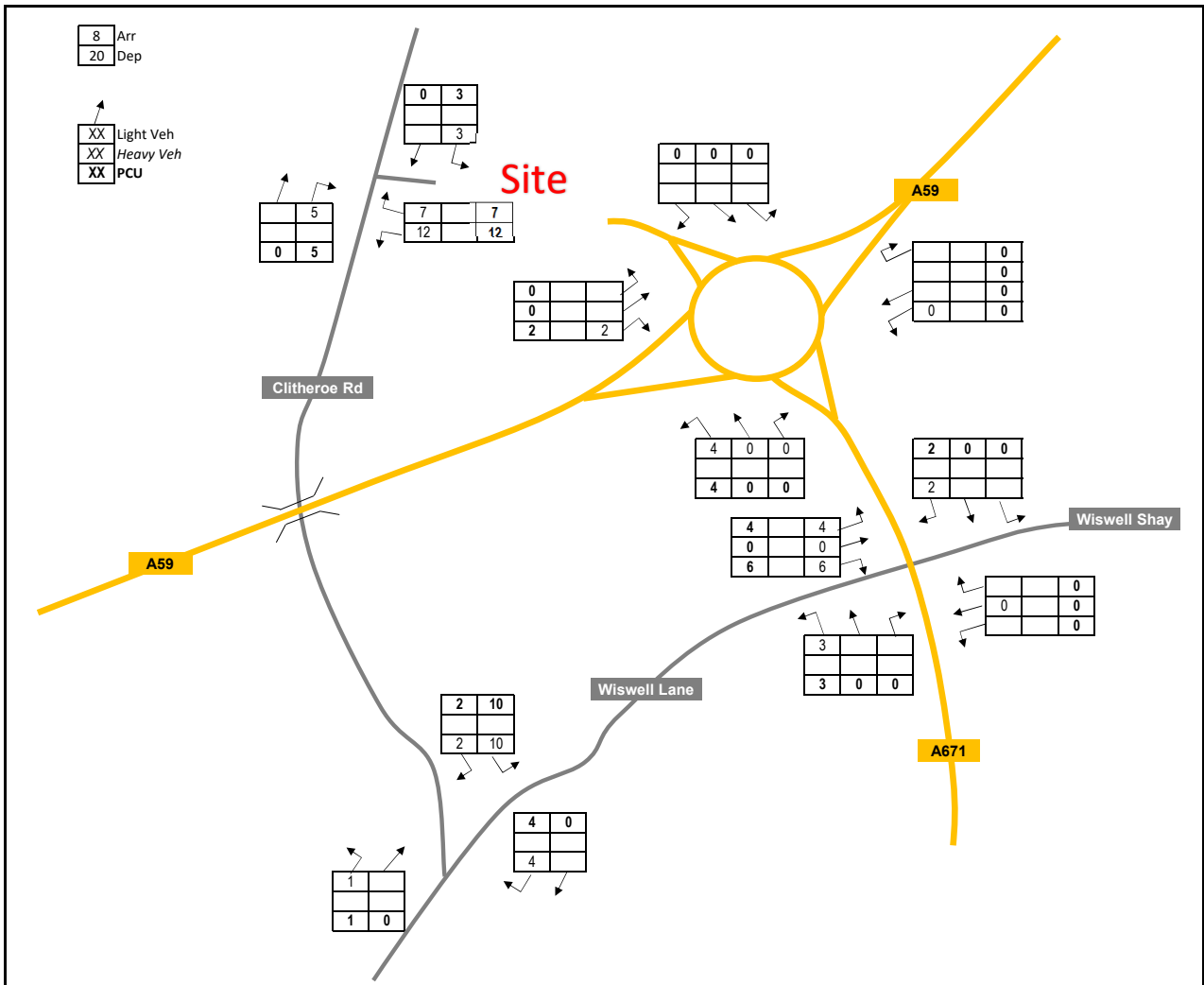
Project: Whalley, Clitheroe
Figure No: 1
Figure Title: Residential Development Traffic Distribution AM





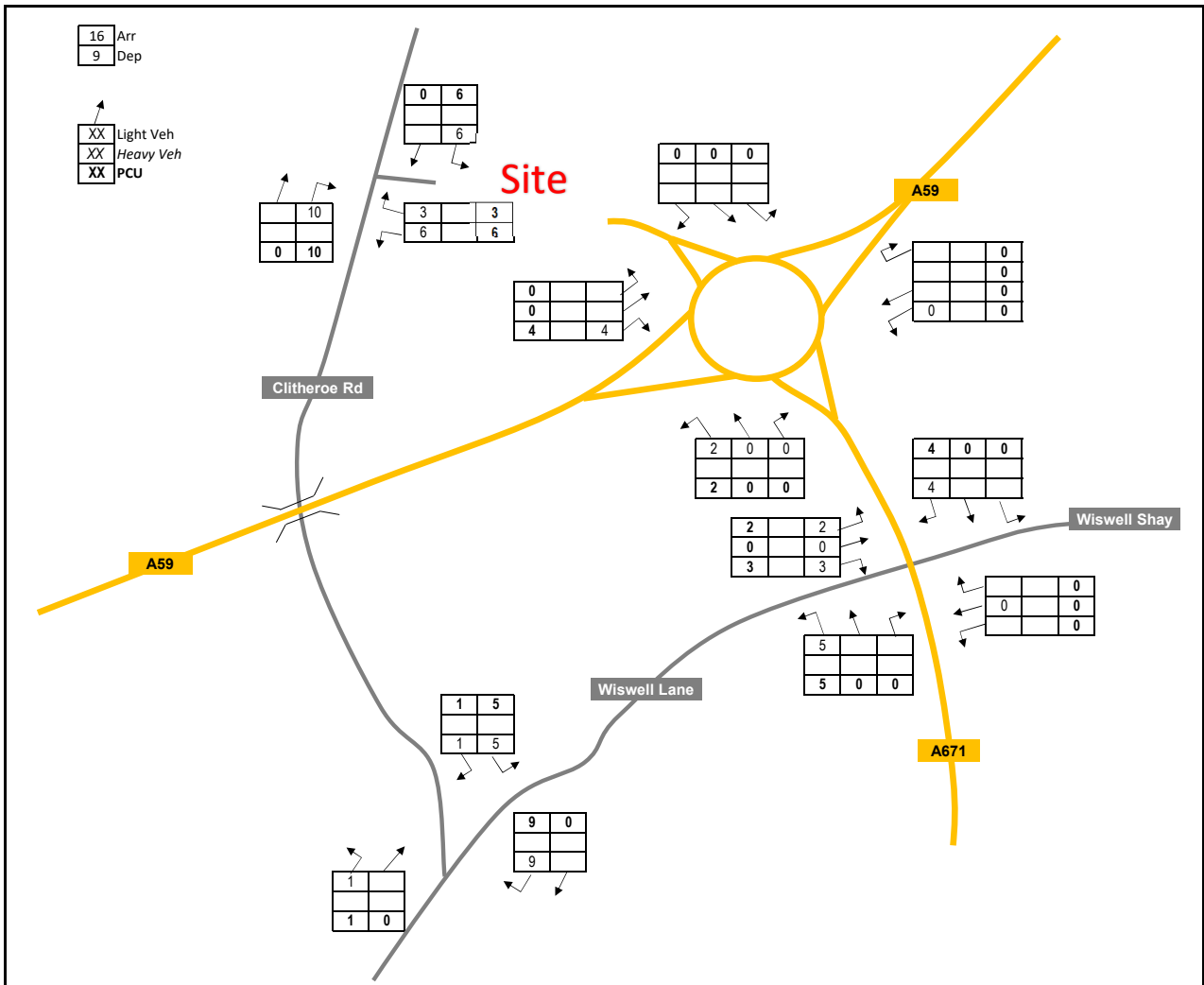
Project: Whalley, Clitheroe
Figure No: 2
Figure Title: Residential Development Traffic Distribution PM





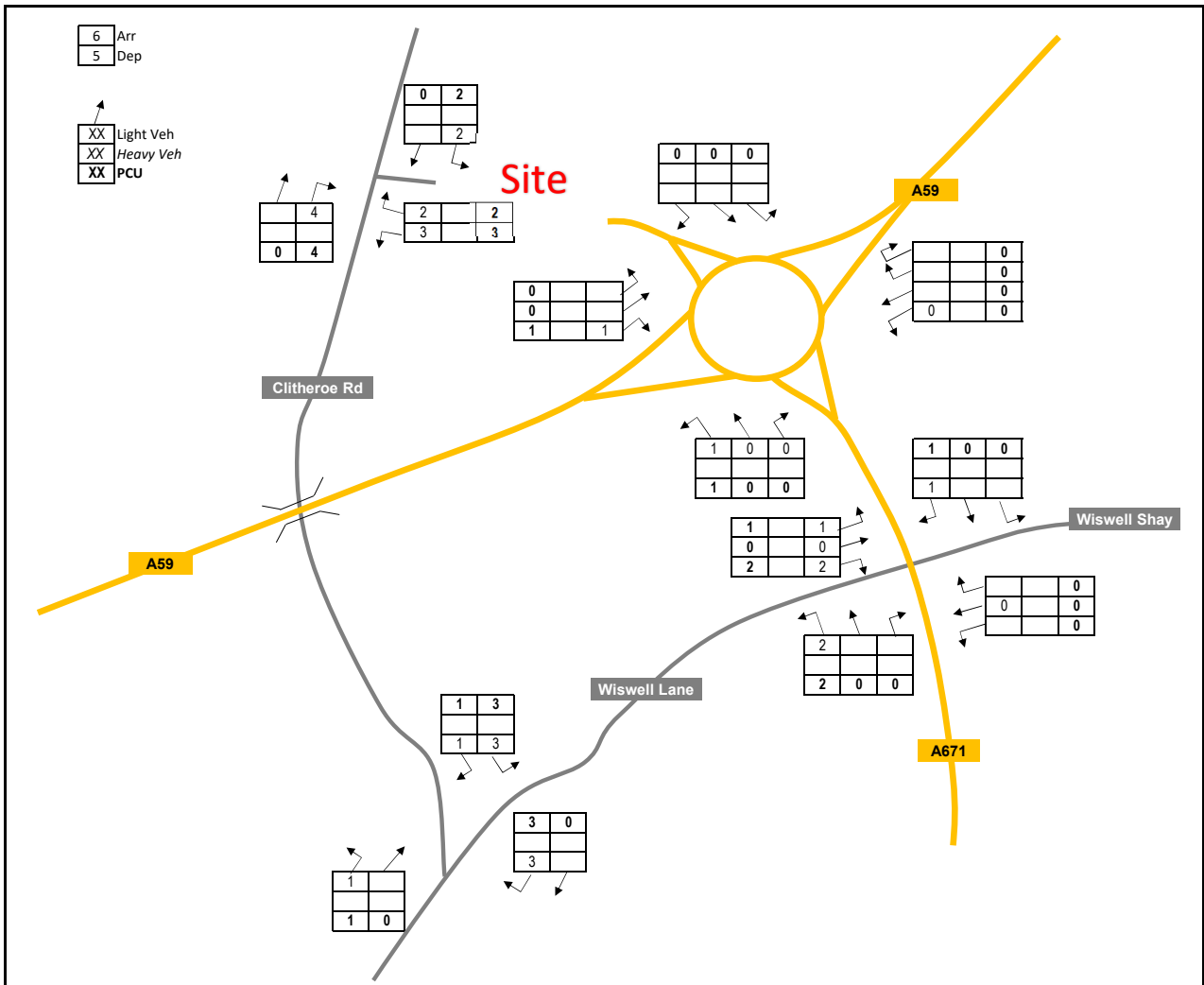
Project: Whalley, Clitheroe
Figure No: 3
Figure Title: Residential Development Traffic Assignment AM





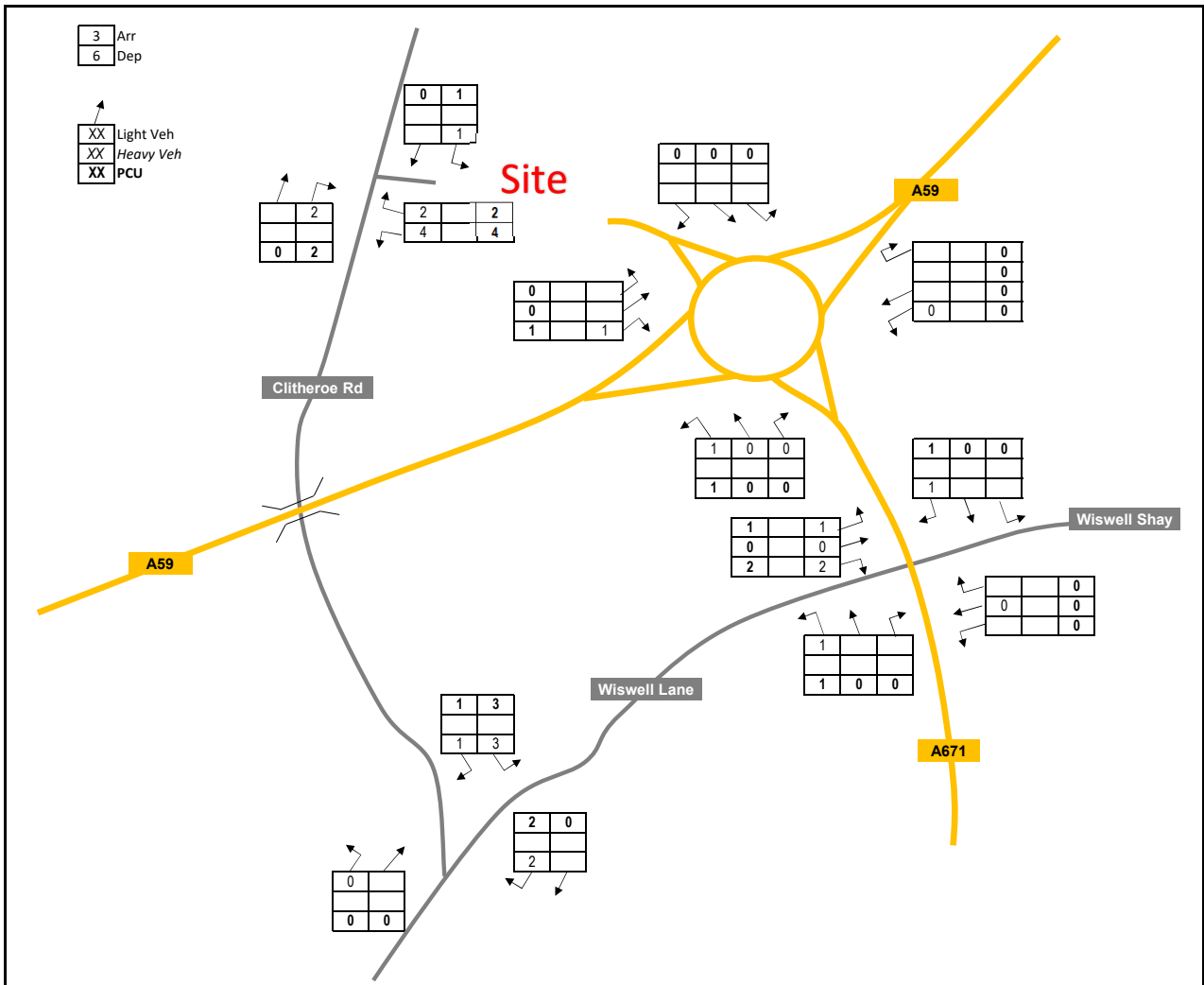
Project: Whalley, Clitheroe
Figure No: 4
Figure Title: Residential Development Traffic Assignment PM





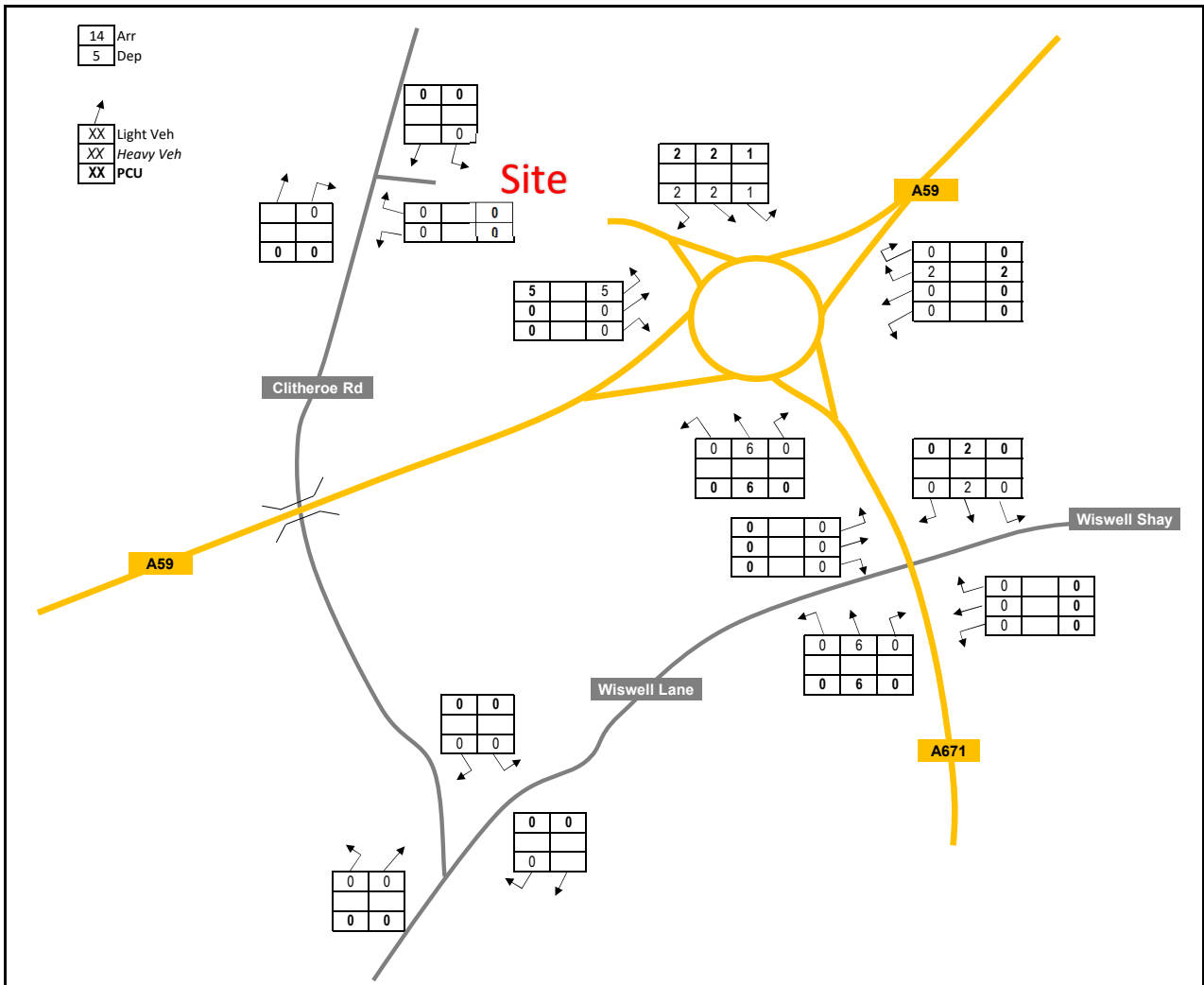
Project: Whalley, Clitheroe
Figure No: 5
Figure Title: Care Home Development Traffic Assignment AM





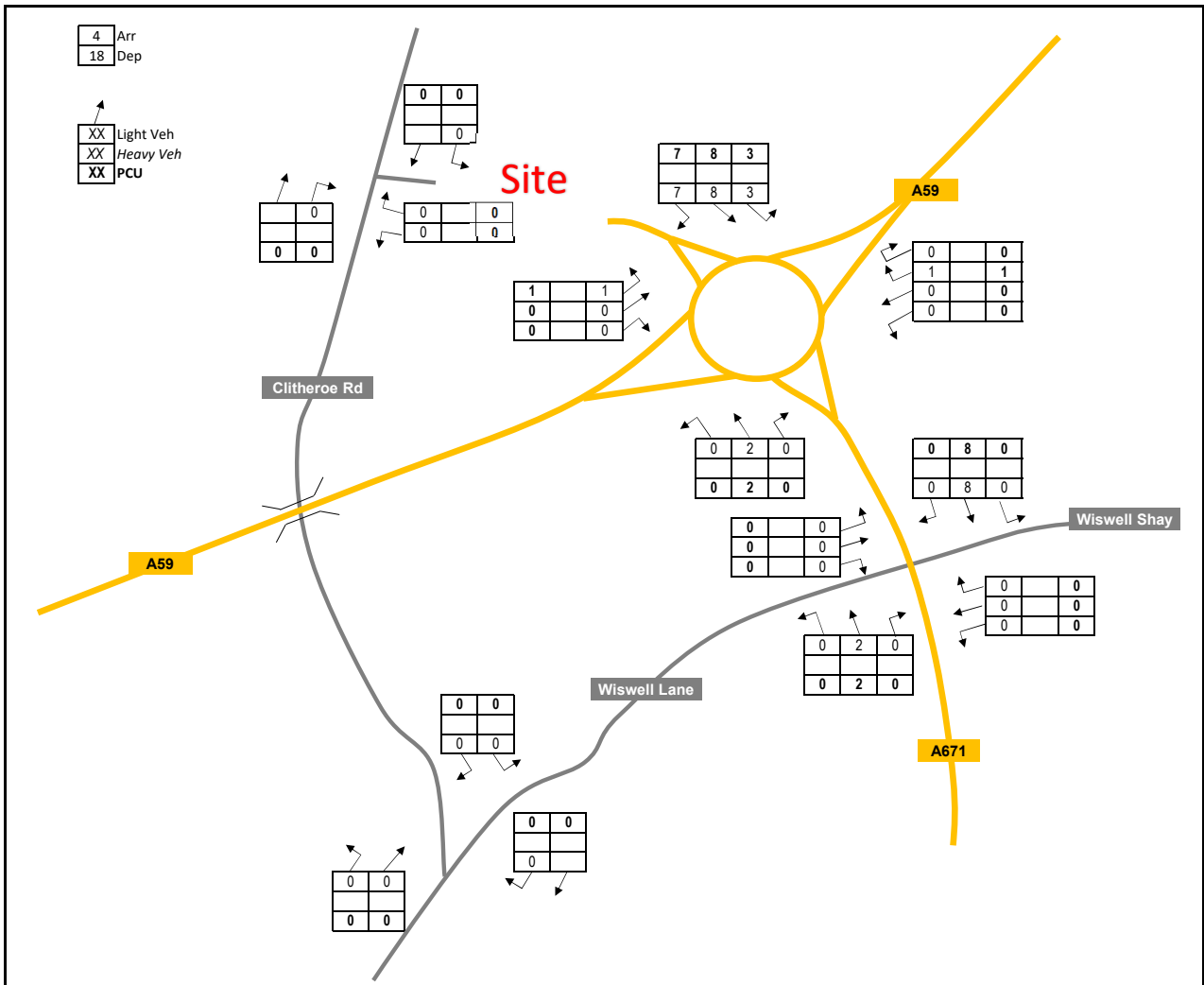
Project: Whalley, Clitheroe
Figure No: 6
Figure Title: Care Home Development Traffic Assignment PM





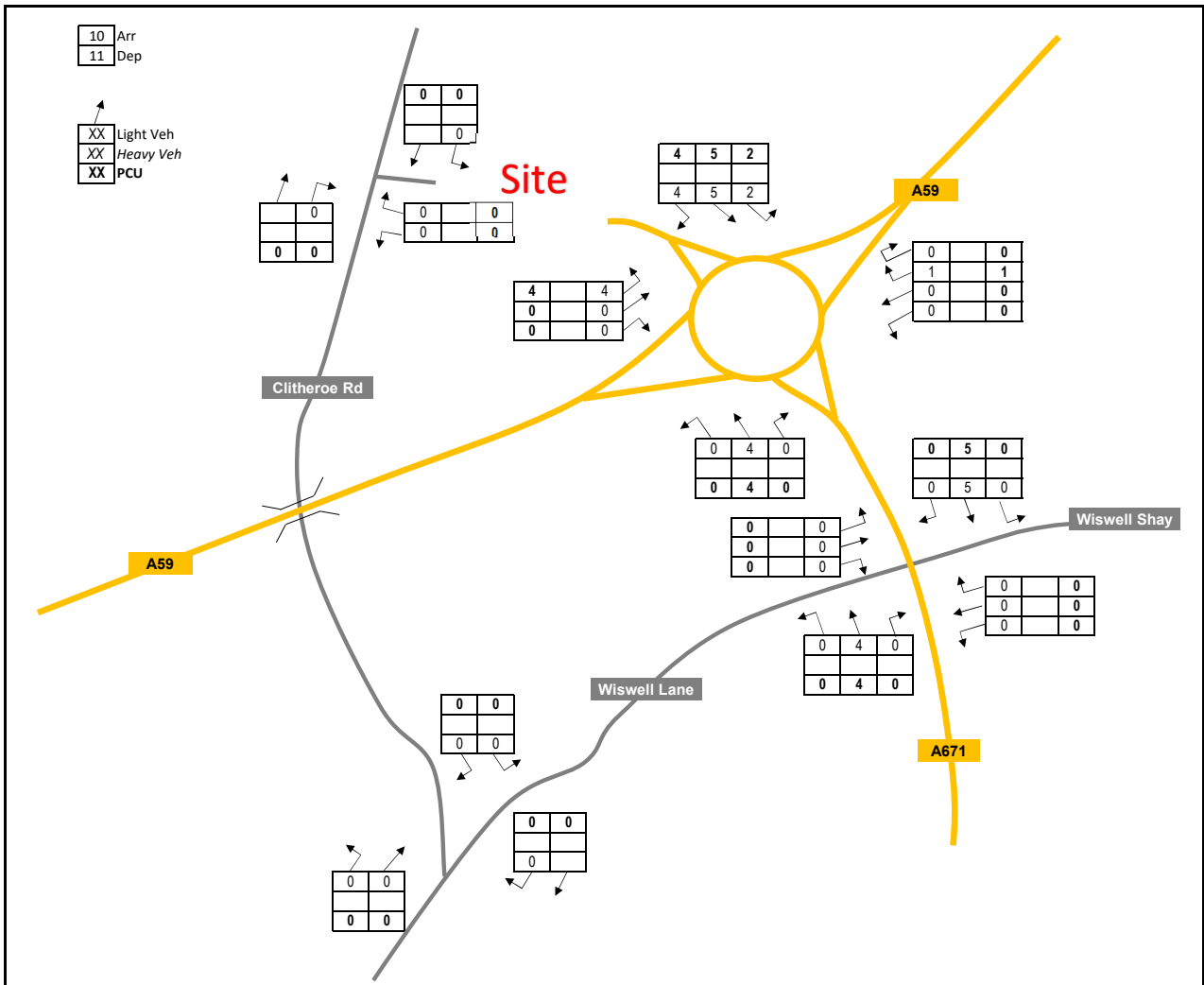
Project: Whalley, Clitheroe
Figure No: 7
Figure Title: Industrial Development Traffic Assignment AM





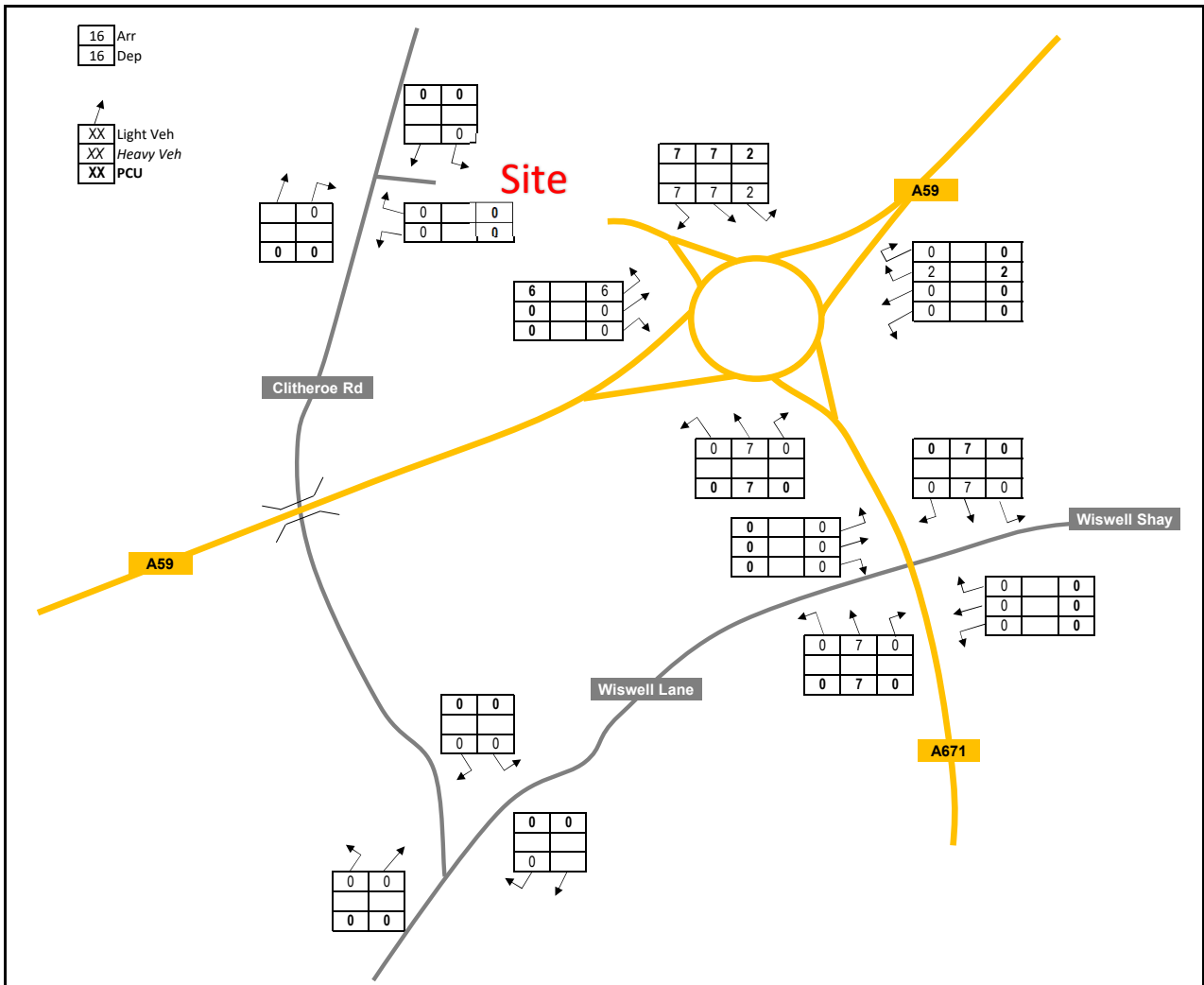
Project: Whalley, Clitheroe
Figure No: 8
Figure Title: Industrial Development Traffic Assignment PM





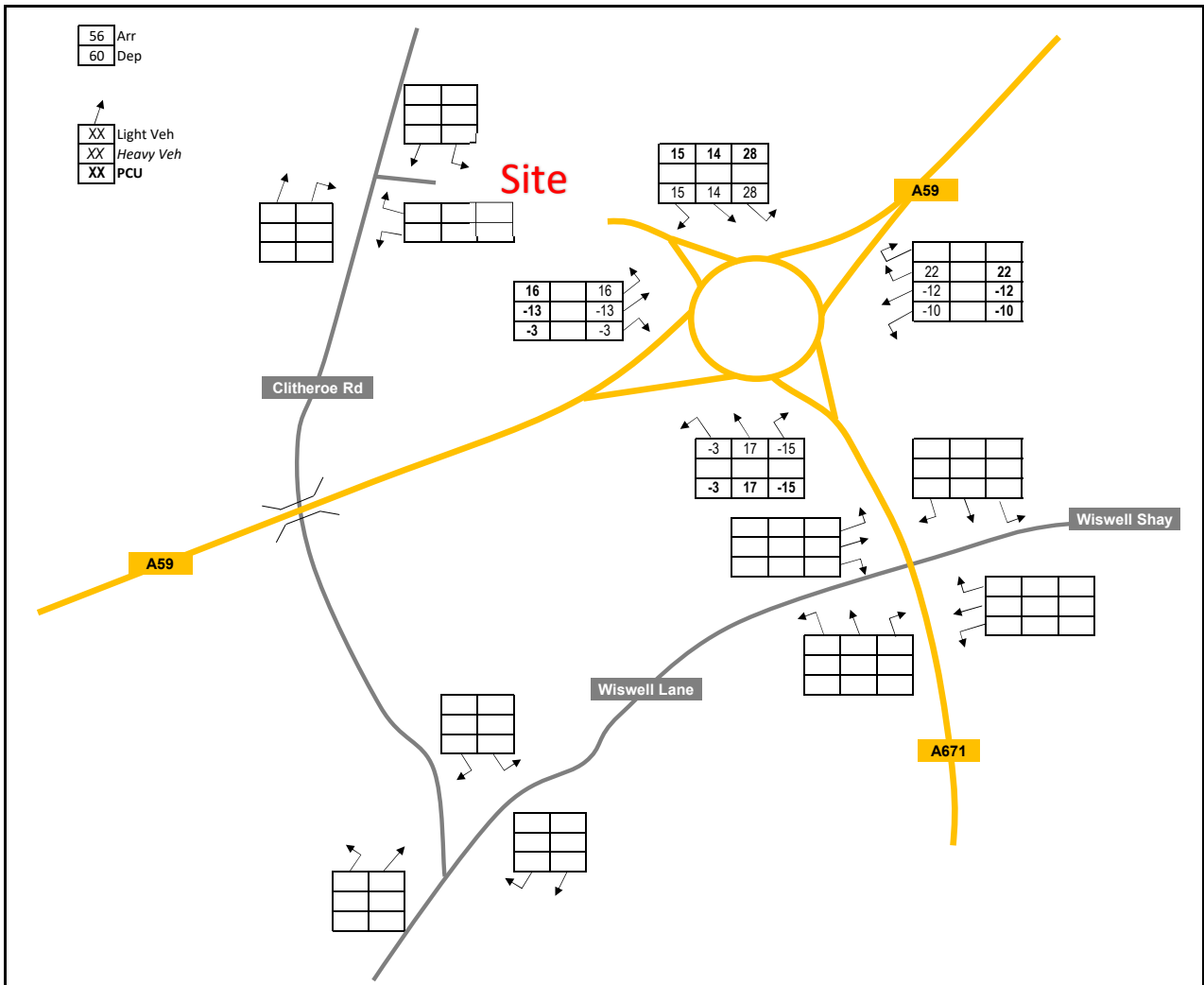
Project: Whalley, Clitheroe
Figure No: 9
Figure Title: PFS New Trips Traffic Assignment AM





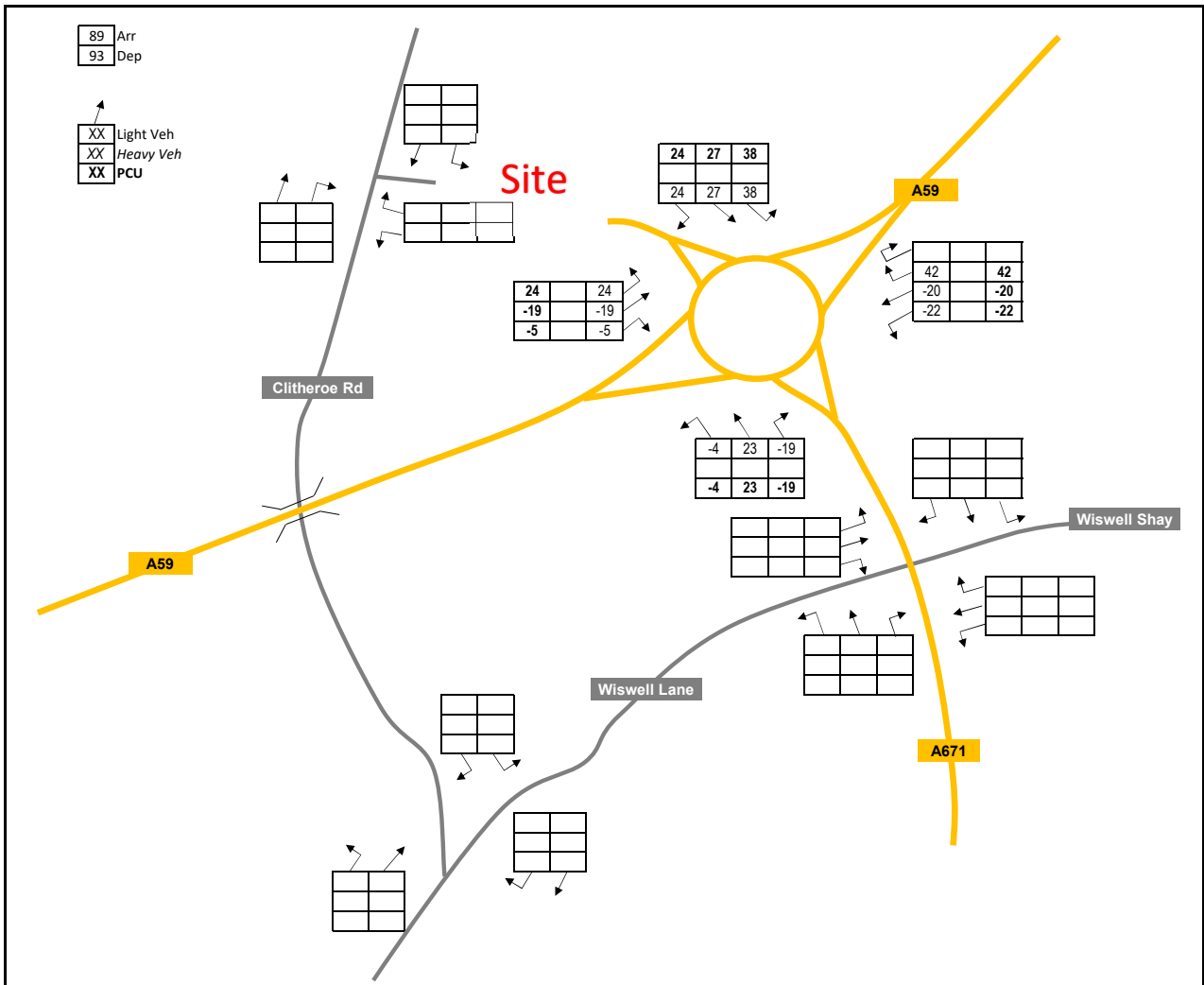
Project: Whalley, Clitheroe
Figure No: 10
PFigure Title: PFS New Trips Traffic Assignment PM





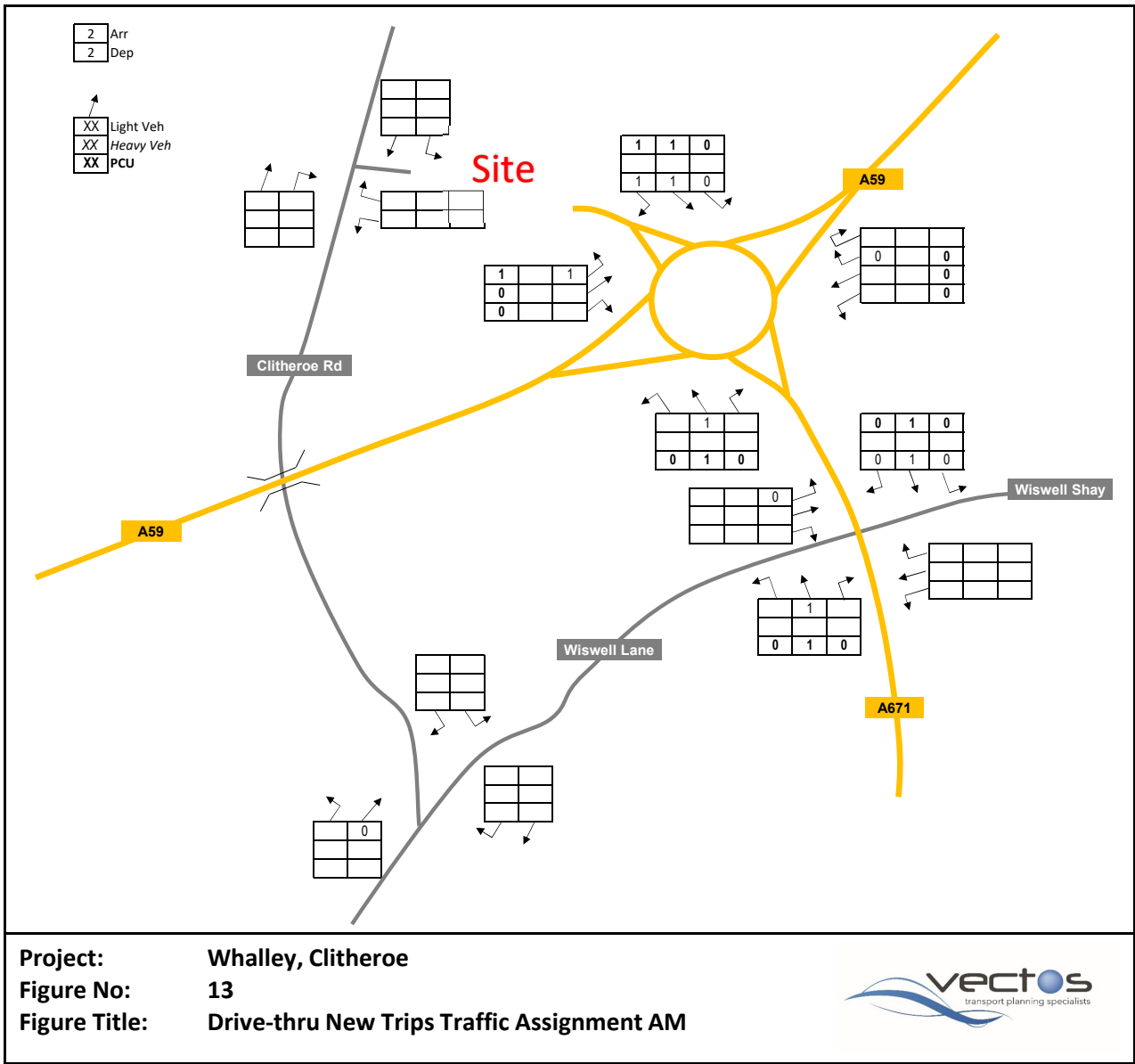
Project: Whalley, Clitheroe
Figure No: 11
Figure Title: PFS Pass-by Trips Traffic Assignment AM

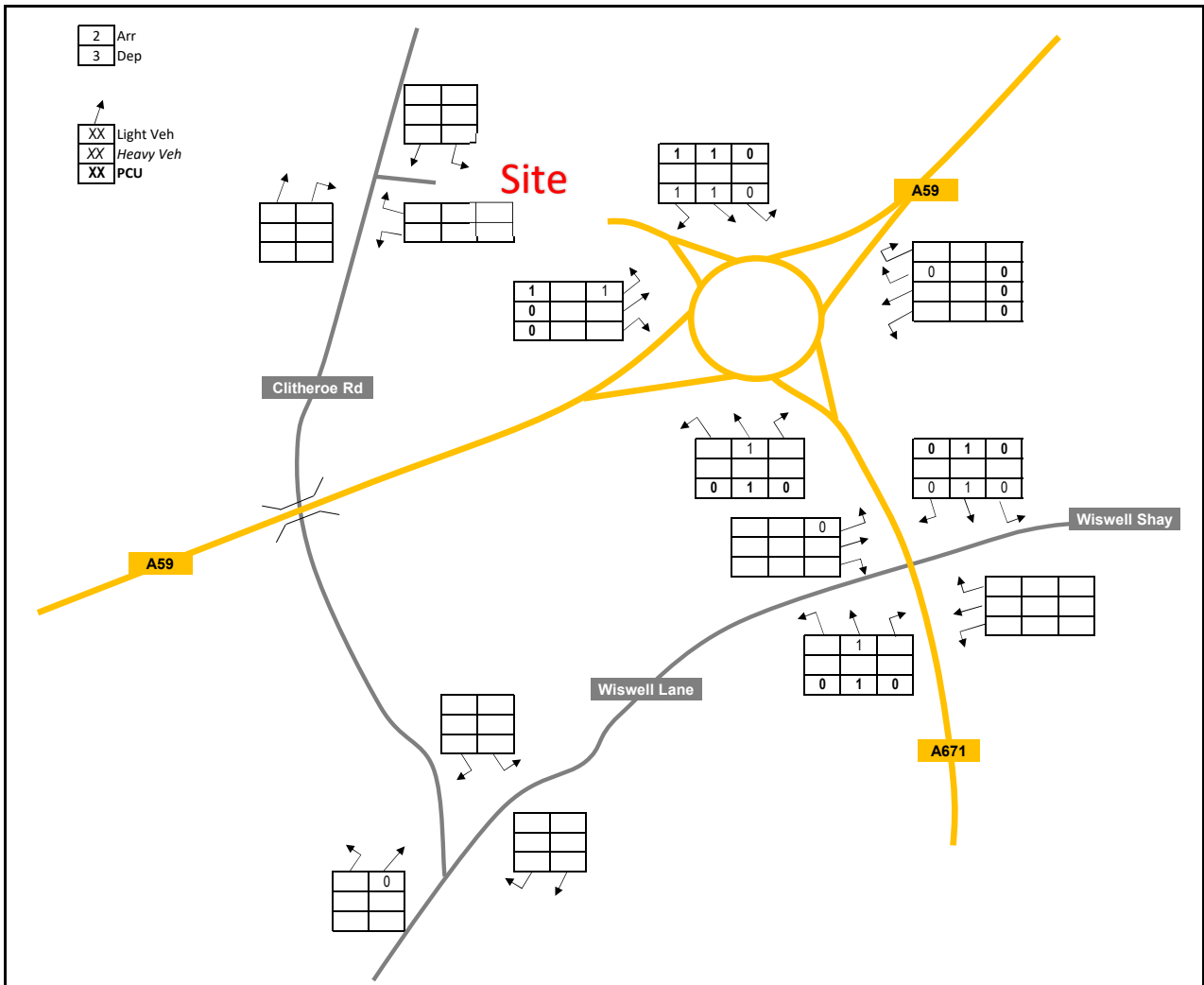




Project: Whalley, Clitheroe
Figure No: 12
Figure Title: PFS Pass-by Trips Traffic Assignment PM

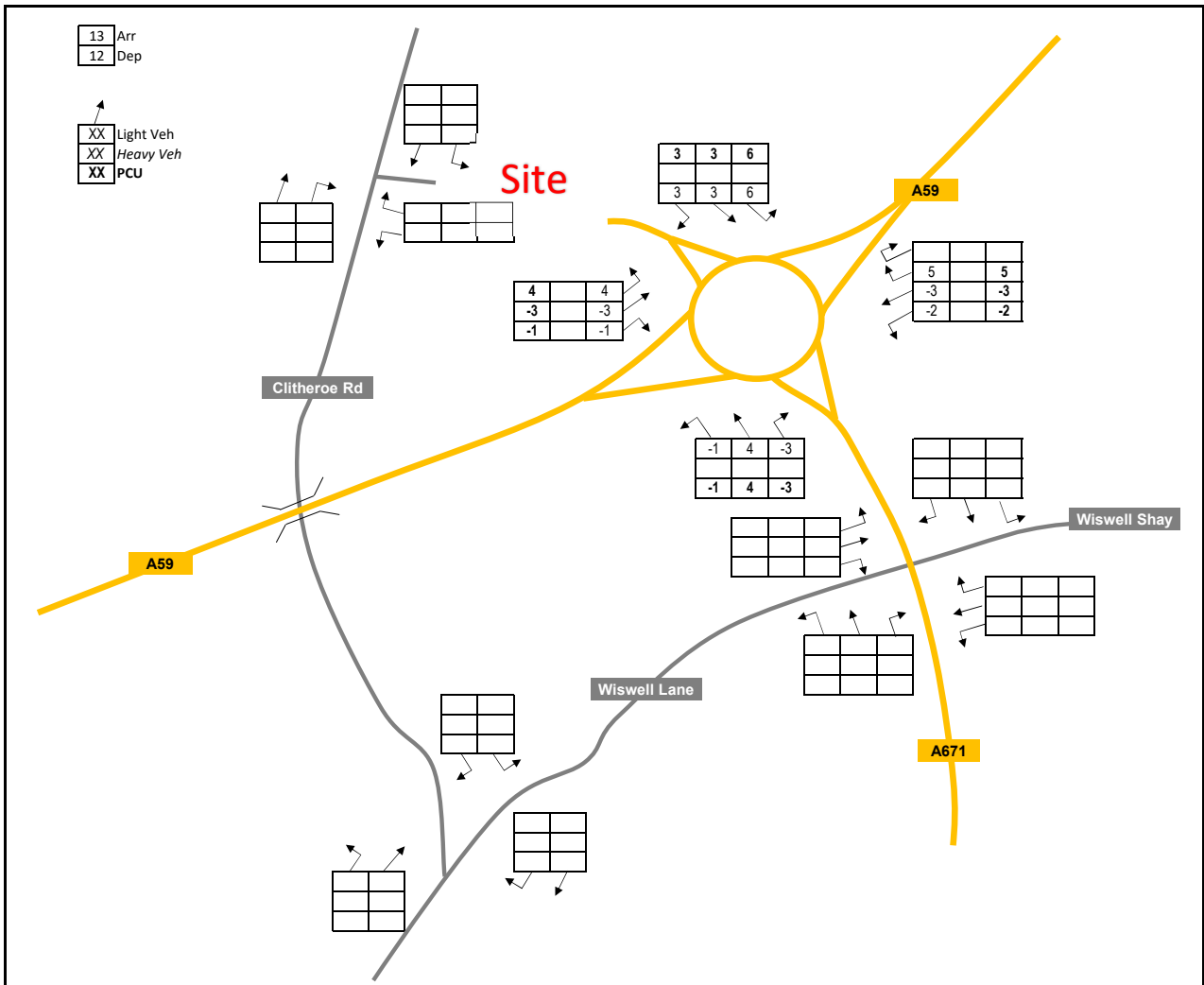






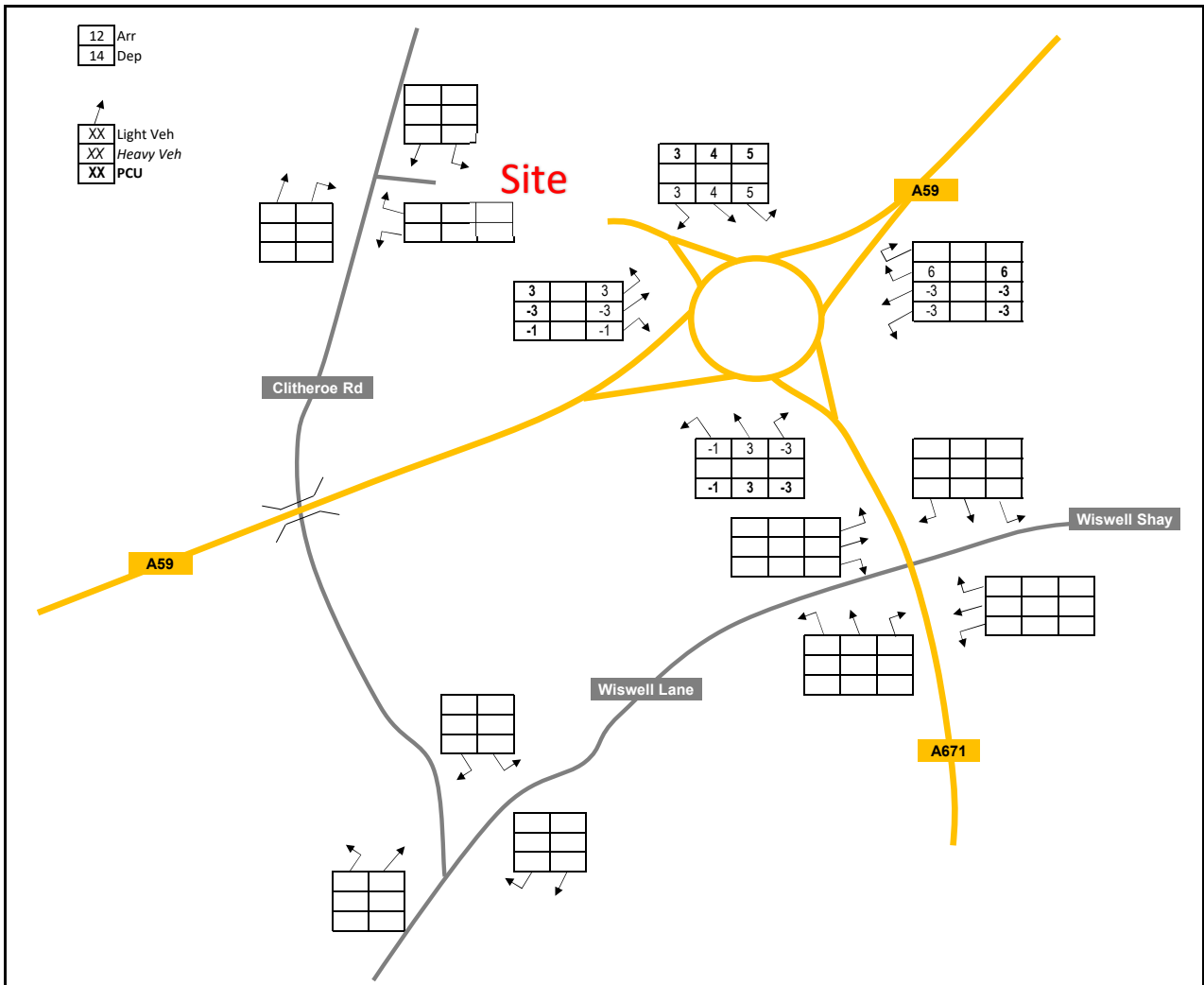
Project: Whalley, Clitheroe
Figure No: 14
Figure Title: Drive-thru New Trips Traffic Assignment PM





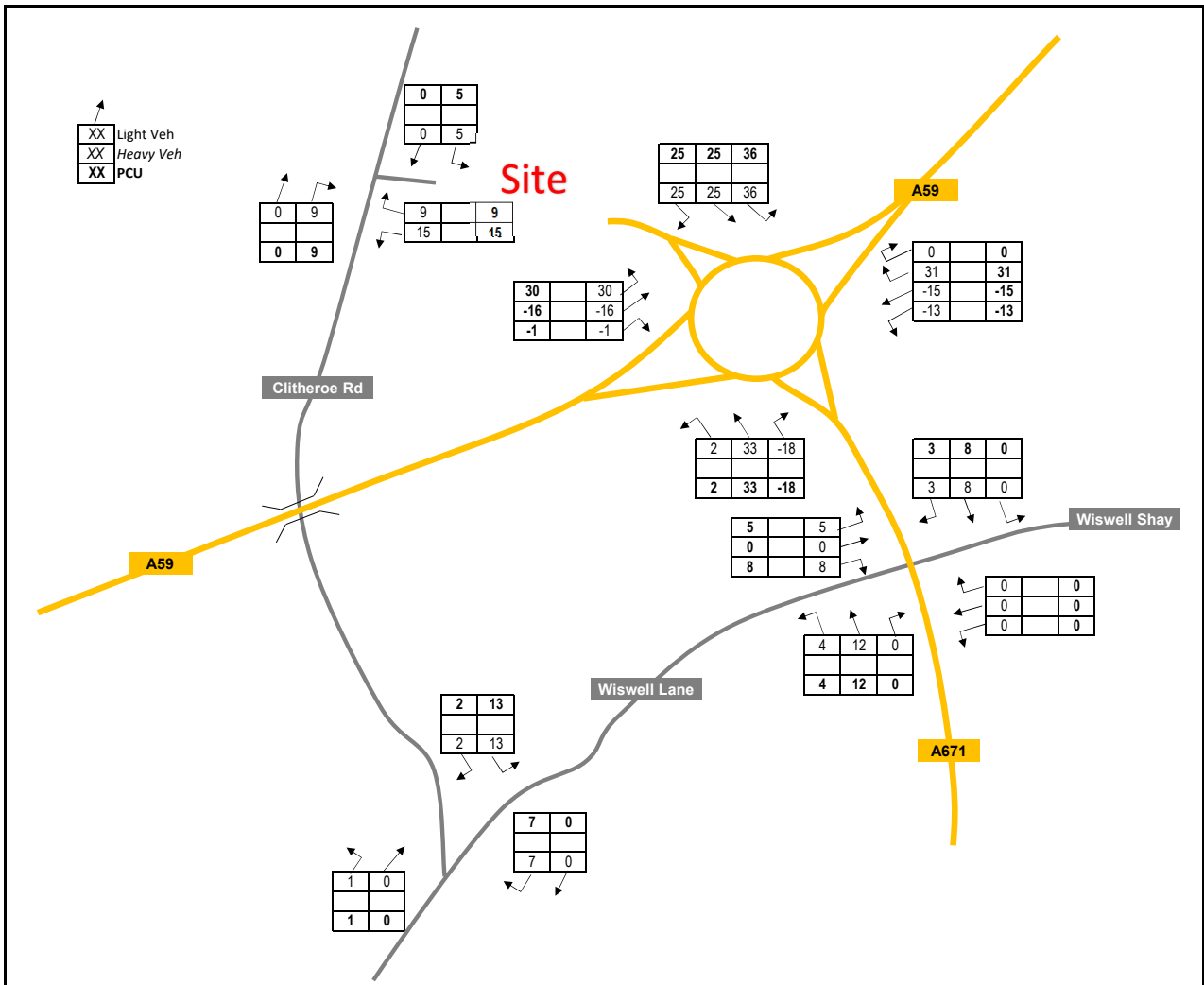
Project: Whalley, Clitheroe
Figure No: 15
Figure Title: Drive-thru Pass-by Trips Traffic Assignment AM





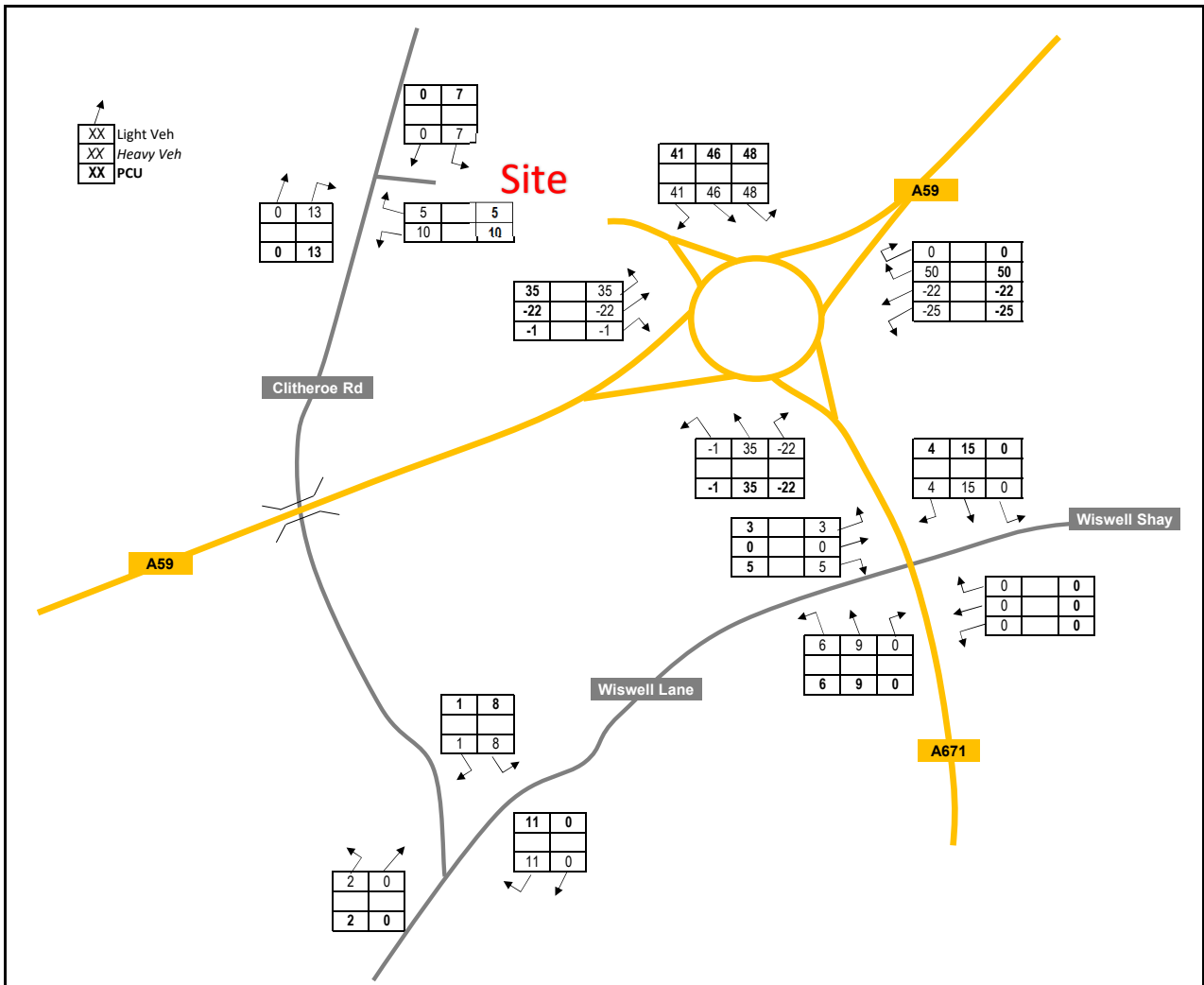
Project: Whalley, Clitheroe
Figure No: 16
Figure Title: Drive-thru Pass-by Trips Traffic Assignment PM





Project: Whalley, Clitheroe
Figure No: 17
Figure Title: Development Traffic Assignment AM



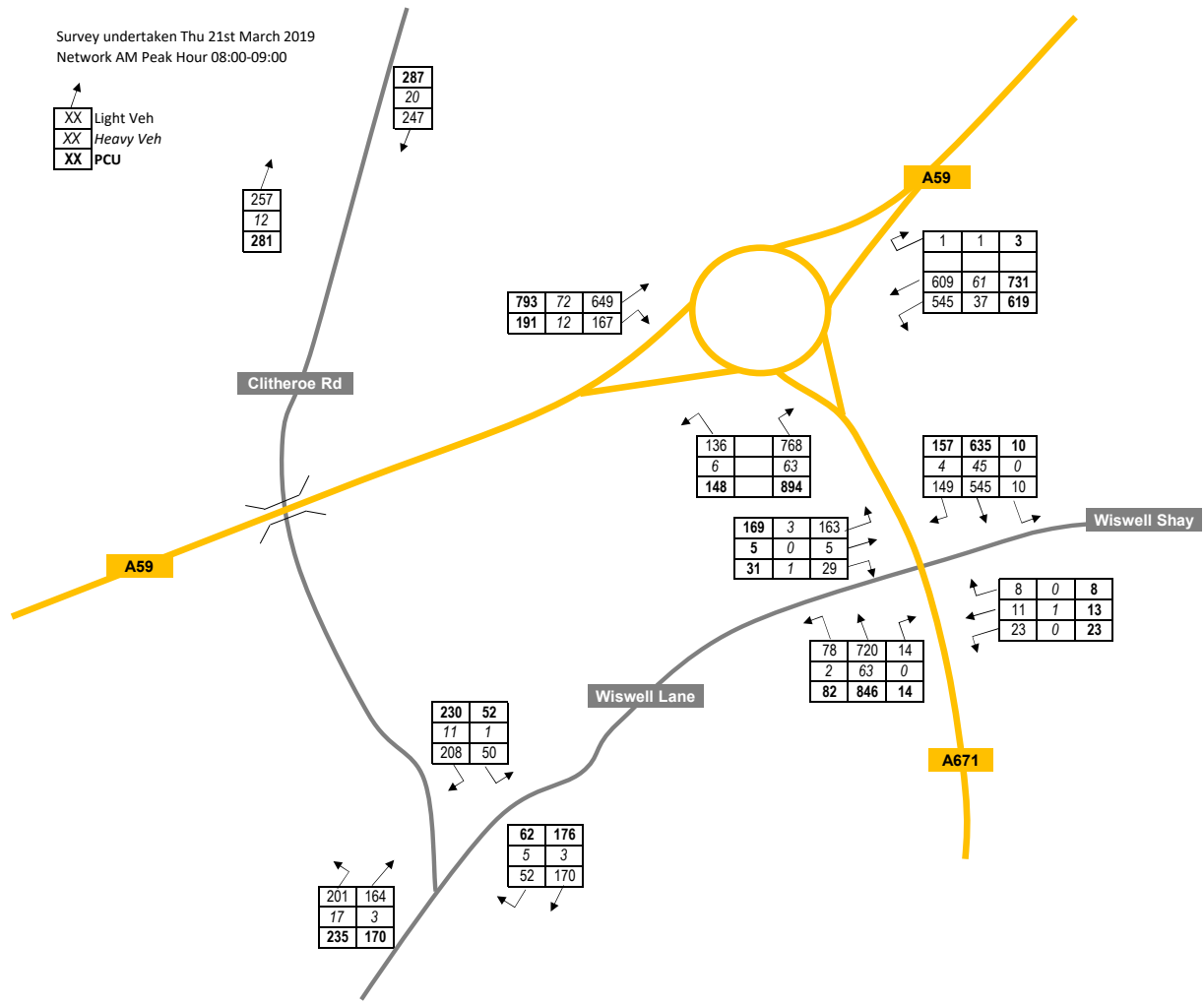


Project: Whalley, Clitheroe
Figure No: 18
Figure Title: Development Traffic Assignment PM



Survey undertaken Thu 21st March 2019
 Network AM Peak Hour 08:00-09:00

XX	Light Veh
XX	Heavy Veh
XX	PCU

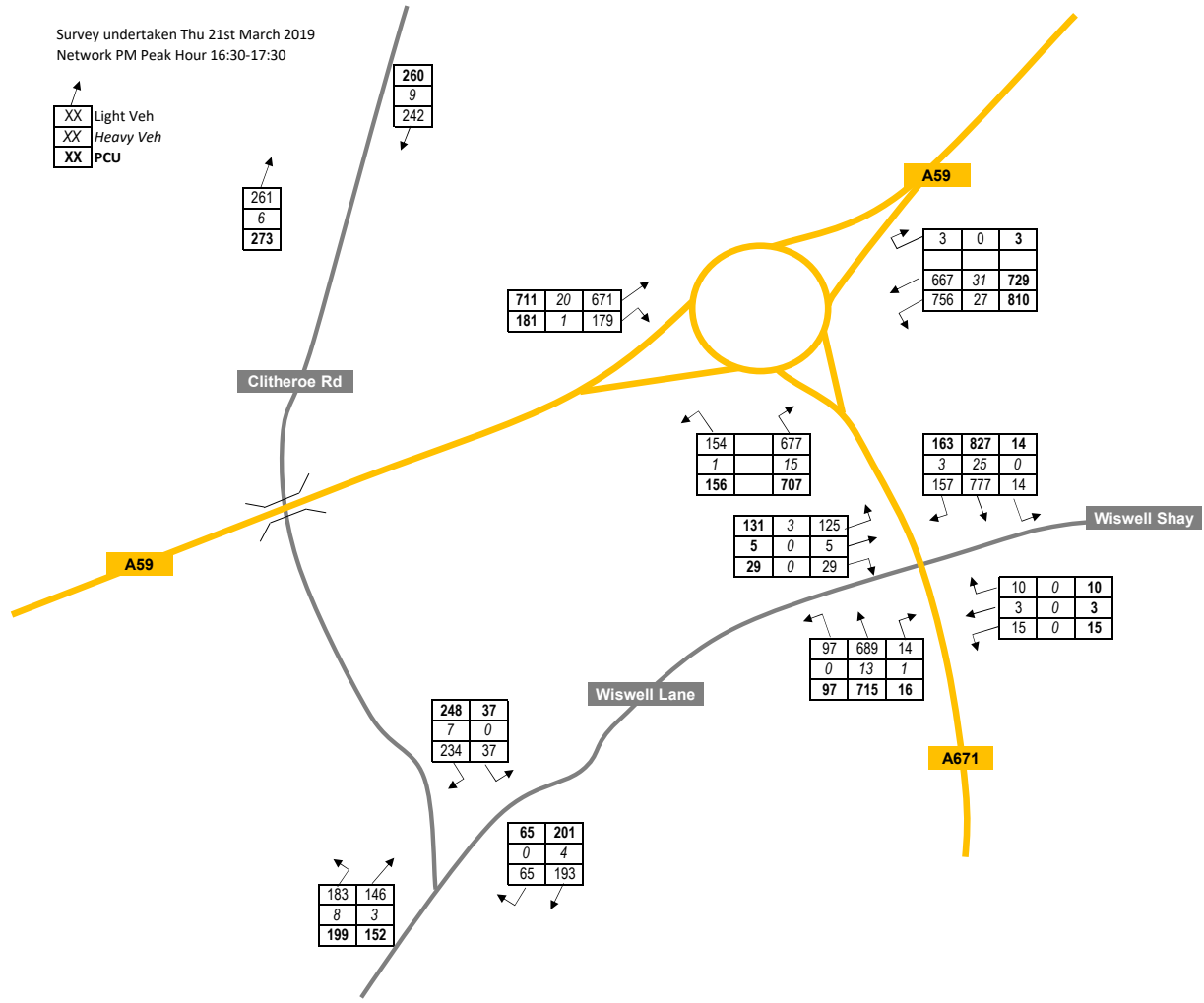


Project: Whalley, Clitheroe
Figure No: 19
Figure Title: 2019 Baseline Traffic Flows: Morning Peak Hour



Survey undertaken Thu 21st March 2019
 Network PM Peak Hour 16:30-17:30

XX	Light Veh
XX	Heavy Veh
XX	PCU

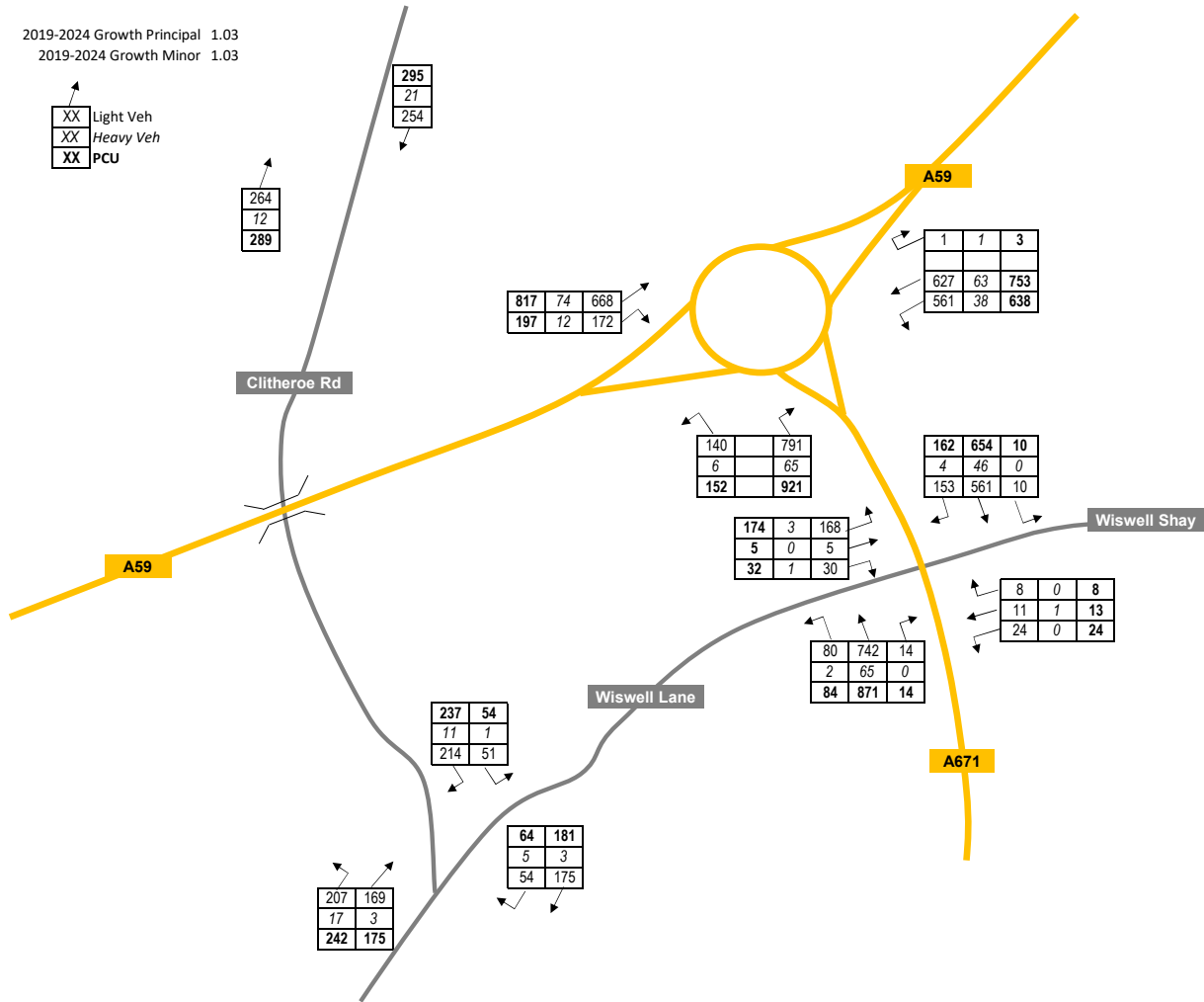


Project: Whalley, Clitheroe
Figure No: 20
Figure Title: 2019 Baseline Traffic Flows: Evening Peak Hour



2019-2024 Growth Principal 1.03
 2019-2024 Growth Minor 1.03

XX	Light Veh
XX	Heavy Veh
XX	PCU

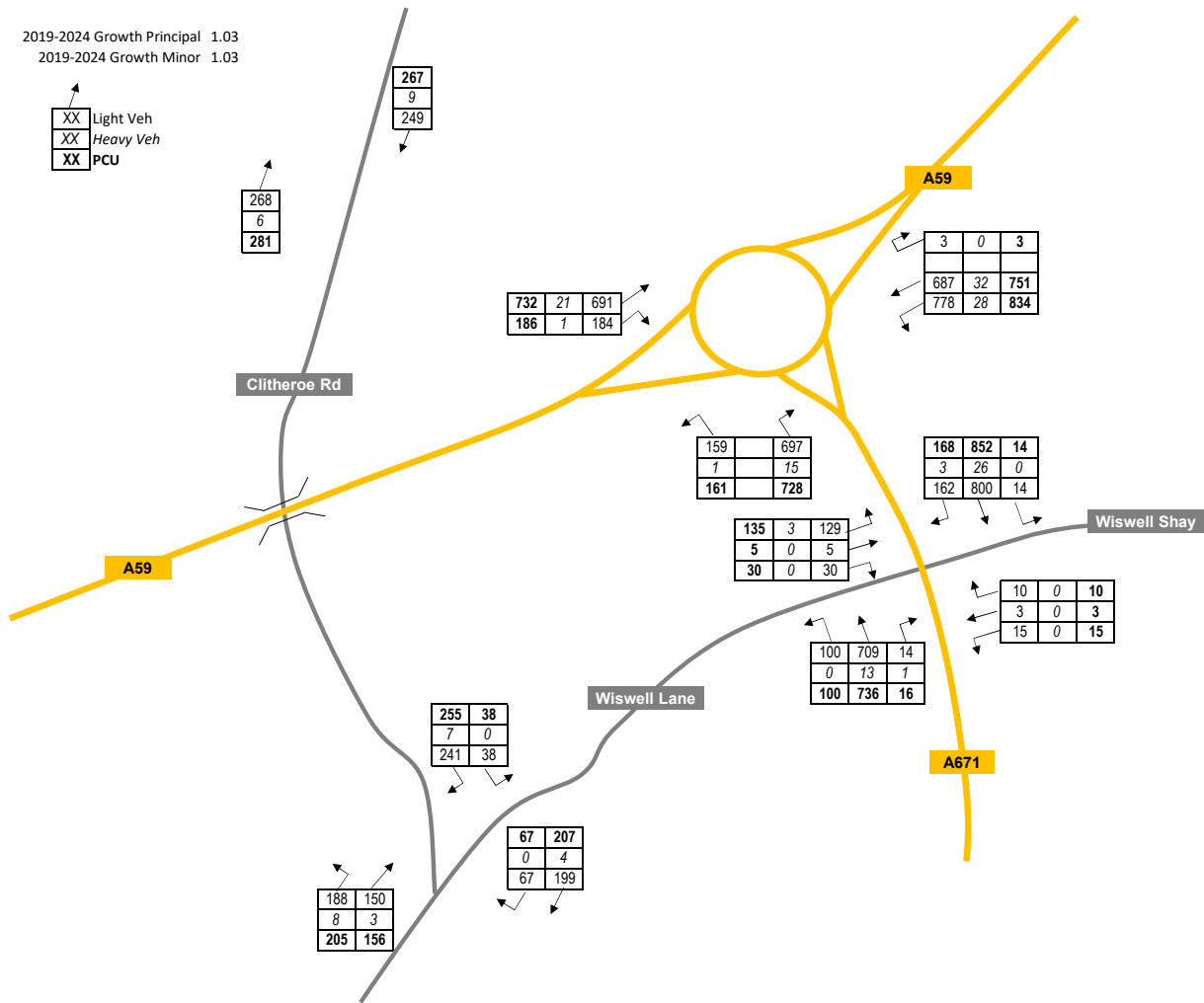


Project: Whalley, Clitheroe
Figure No: 21
Figure Title: 2024 Baseline Traffic Flows: Morning Peak Hour



2019-2024 Growth Principal 1.03
 2019-2024 Growth Minor 1.03

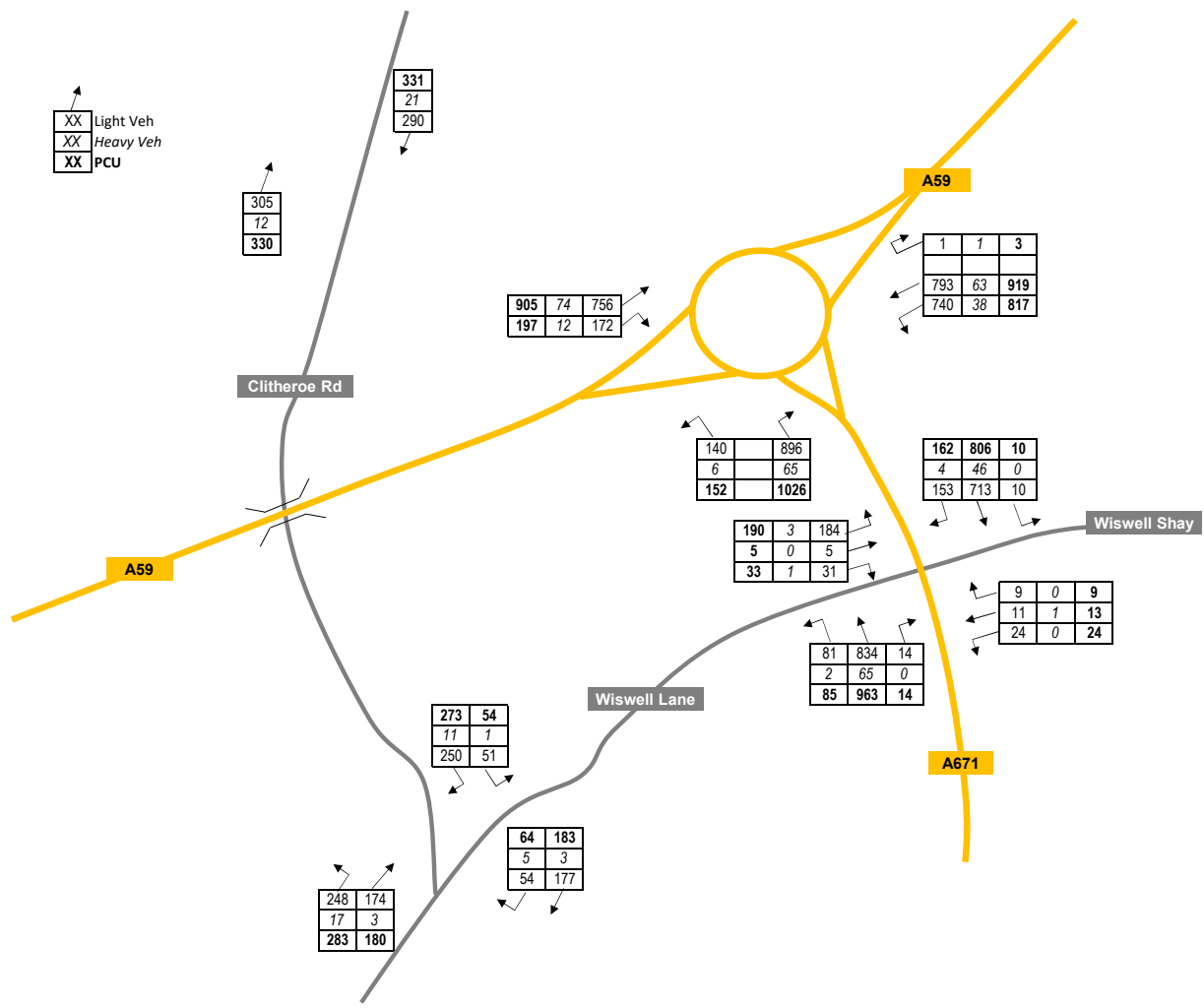
XX	Light Veh
XX	Heavy Veh
XX	PCU



Project: Whalley, Clitheroe
Figure No: 22
Figure Title: 2024 Baseline Traffic Flows: Evening Peak Hour



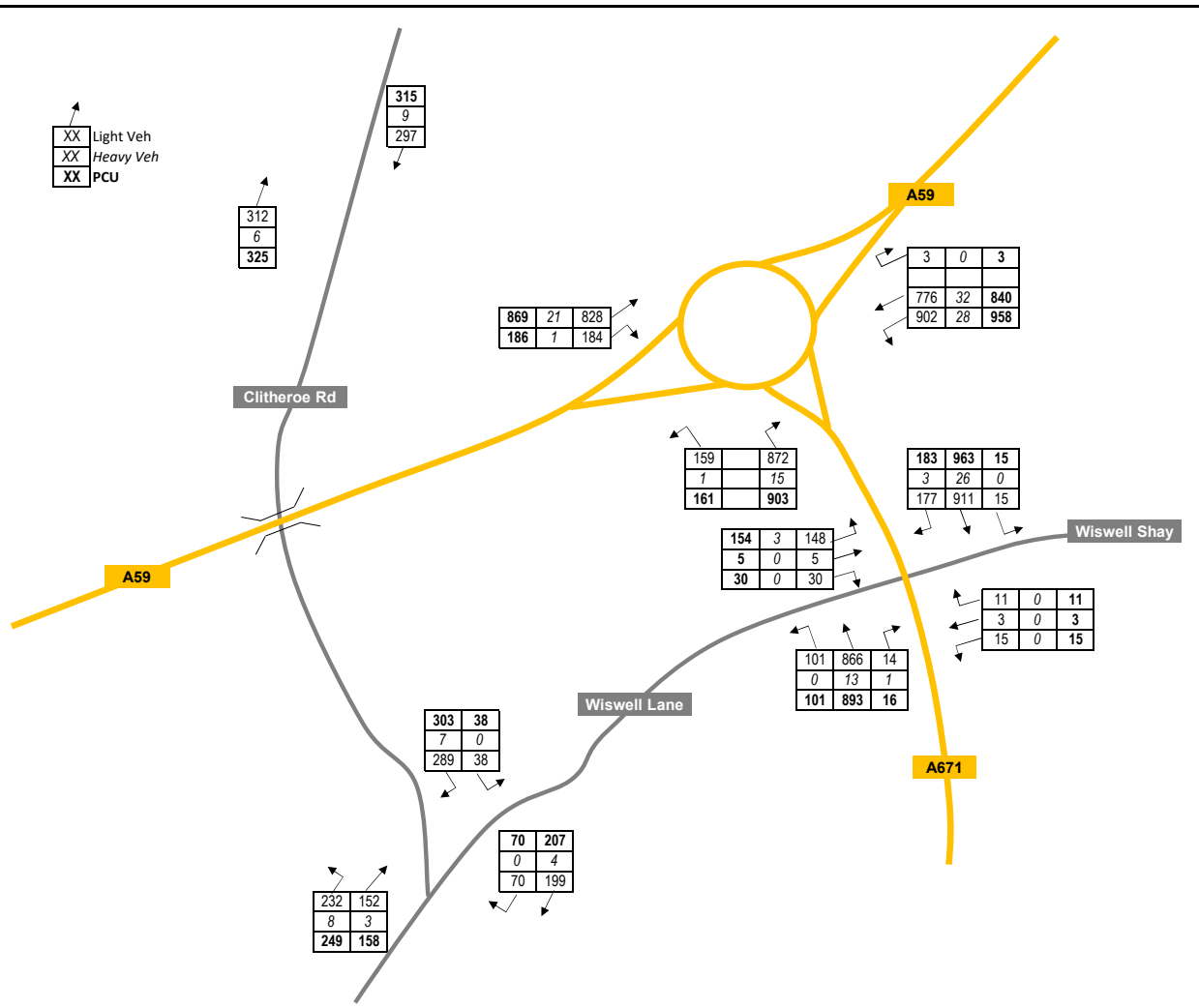
XX	Light Veh
XX	Heavy Veh
XX	PCU



Project: Whalley, Clitheroe
 Figure No: 23
 Figure Title: 2024 Baseline 'Without Development' Traffic Flows: AM Peak

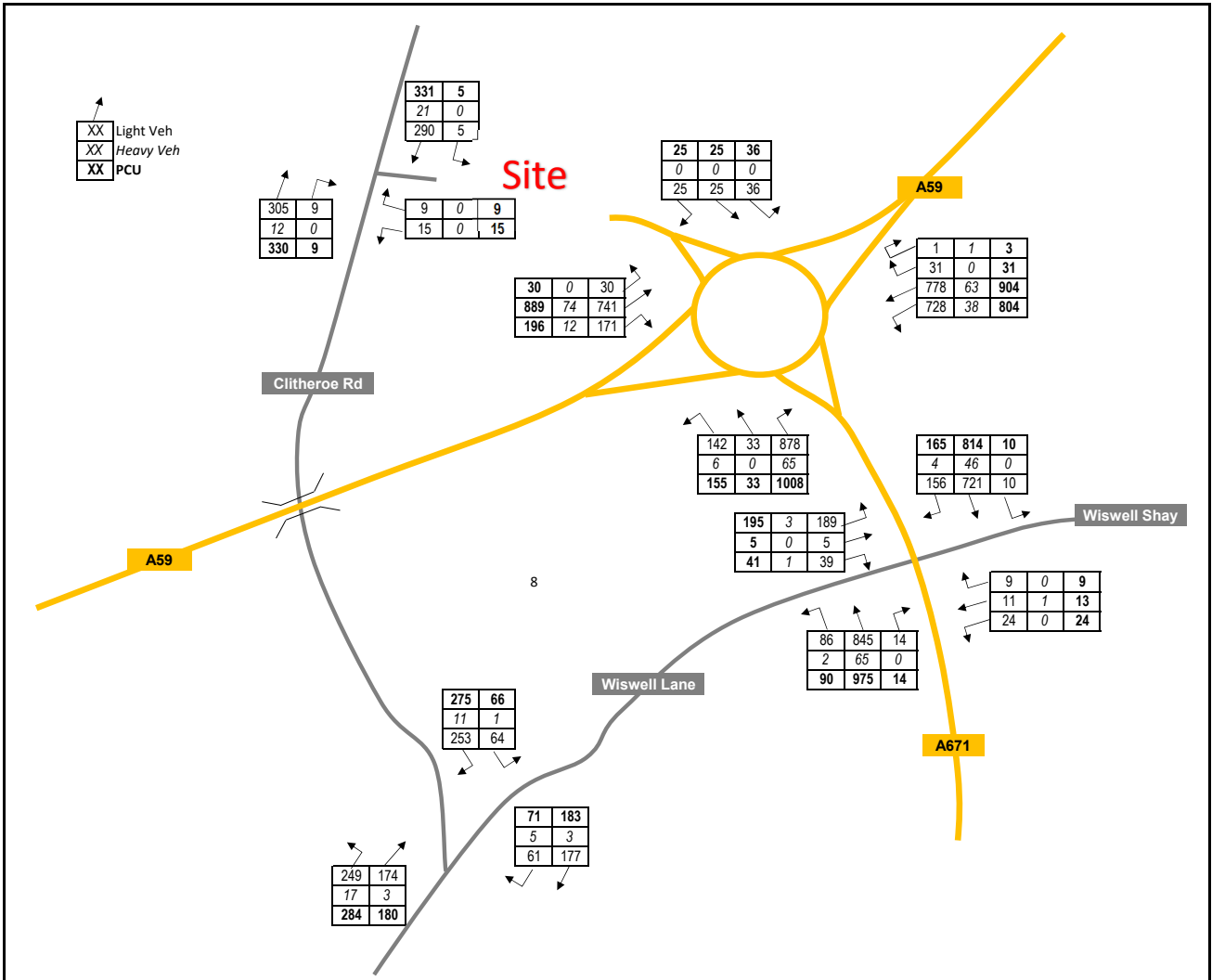


XX	Light Veh
XX	Heavy Veh
XX	PCU



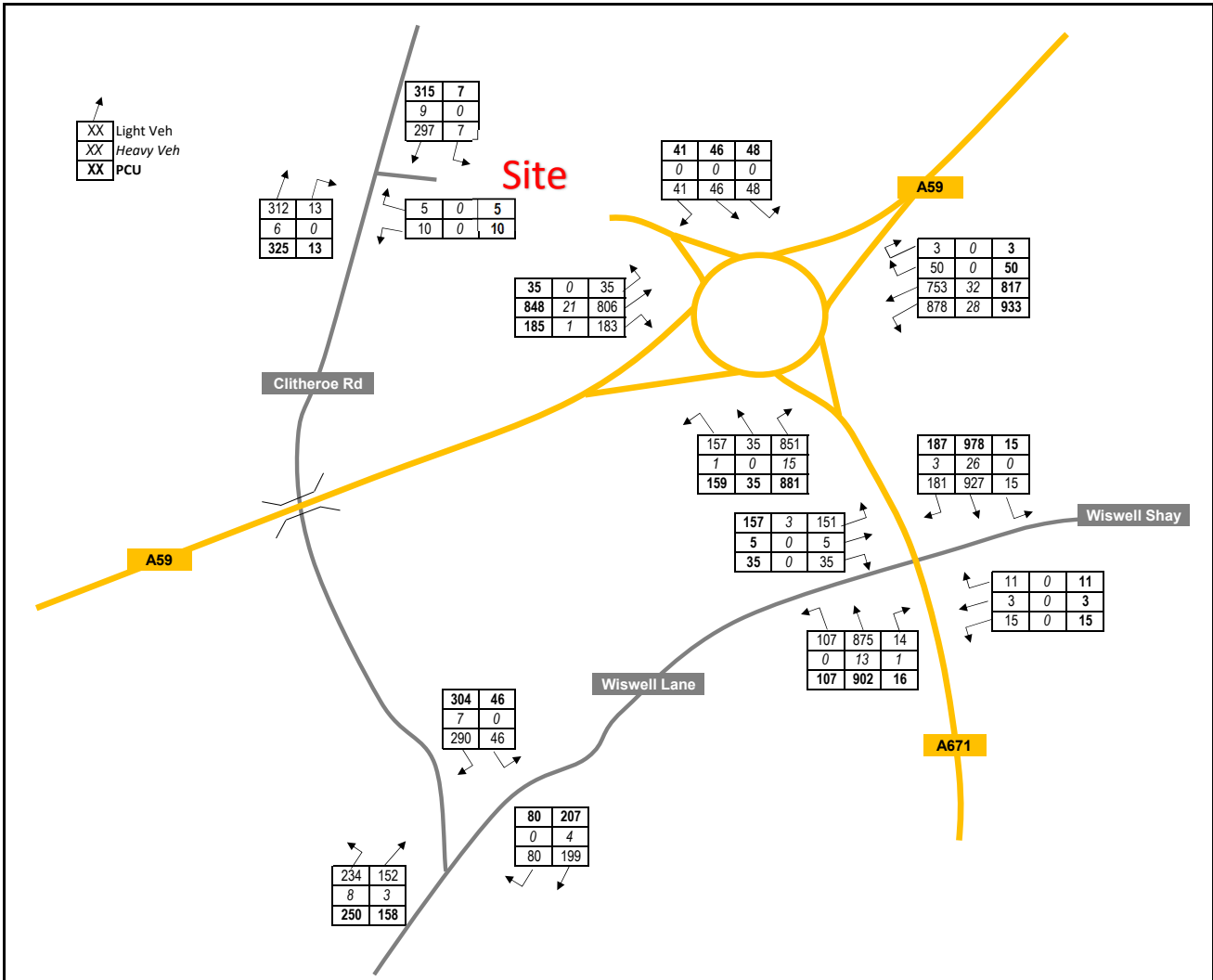
Project: Whalley, Clitheroe
 Figure No: 24
 Figure Title: 2024 Baseline 'Without Development' Flows: PM Peak





Project: Whalley, Clitheroe
 Figure No: 25
 Figure Title: 2024 'With Development' Flows AM Peak





Project: Whalley, Clitheroe
Figure No: 26
Figure Title: 2024 'With Development' Flows PM Peak



Appendix J – A59 / A671 Modelling Outputs Without Development

Junctions 8
ARCADY 8 - Roundabout Module
Version: 8.0.6.541 [19821,26/11/2015] © Copyright TRL Limited, 2020
For sales and distribution information, program advice and maintenance, contact TRL: Tel: +44 (0)1344 770758 email: software@trl.co.uk Web: http://www.trlsoftware.co.uk
The users of this computer program for the solution of an engineering problem are in no way relieved of their responsibility for the correctness of the solution

Filename: A671_A59 07.04.20 UPDATED GEO.arc8
Path: N:\Vectos Job Data\2019\VN91274 Whalley, Clitheroe\Arcady
Report generation date: 20/11/2020 14:03:03

- » (Default Analysis Set) - 2019 Base, AM
- » (Default Analysis Set) - 2019 Base, PM
- » (Default Analysis Set) - 2024 Base, AM
- » (Default Analysis Set) - 2024 Base, PM
- » (Default Analysis Set) - 2024 Base + Committed, AM
- » (Default Analysis Set) - 2024 Base + Committed, PM

Summary of junction performance

	AM		PM	
	Queue (PCU)	RFC	Queue (PCU)	RFC
A1 - 2019 Base				
Arm A	1.97	0.67	3.06	0.76
Arm B	1.86	0.65	1.17	0.54
Arm C	2.26	0.70	1.44	0.59
A1 - 2024 Base				
Arm A	2.18	0.69	3.51	0.78
Arm B	2.08	0.68	1.27	0.56
Arm C	2.60	0.73	1.57	0.61
A1 - 2024 Base + Committed				
Arm A	5.80	0.86	7.31	0.89
Arm B	3.65	0.79	2.23	0.69
Arm C	4.36	0.82	2.94	0.75

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

- "D1 - 2019 Base, AM" model duration: 08:00 - 09:30
- "D2 - 2019 Base, PM" model duration: 16:30 - 18:00
- "D3 - 2019 Base, Saturday" model duration: 12:15 - 13:45
- "D4 - 2024 Base, AM" model duration: 08:00 - 09:30
- "D5 - 2024 Base, PM" model duration: 16:30 - 18:00
- "D6 - 2024 Base, Saturday" model duration: 12:15 - 13:45
- "D7 - 2024 Base + Committed, AM" model duration: 08:00 - 09:30
- "D8 - 2024 Base + Committed, PM" model duration: 16:30 - 18:00

Run using Junctions 8.0.6.541 at 20/11/2020 14:03:00

File summary

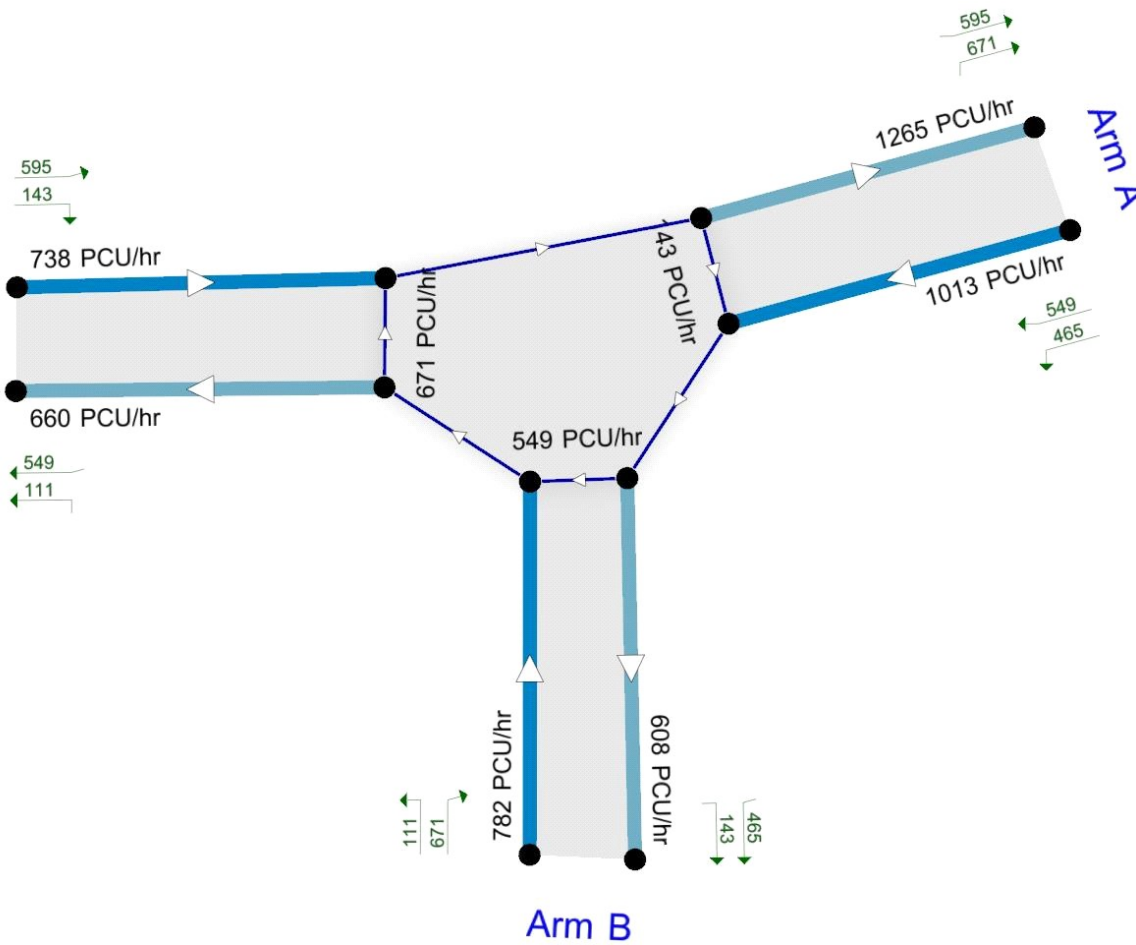
Title	(untitled)
Location	
Site Number	
Date	16/04/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	Office
Description	

Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	RFC Threshold	Average Delay Threshold (s)	Queue Threshold (PCU)
5.75			N/A	0.85	36.00	20.00

Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
m	kph	PCU	PCU	perHour	s	-Min	perMin



Showing modelled flow through junction (PCU/hr).
 Time Segment: (08:00-08:15)
 Showing Analysis Set "A1"; Demand Set "D1 - 2019 Base, AM"

The junction diagram reflects the last run of ARCADY.

(Default Analysis Set) - 2019 Base, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm B - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Analysis Set Details

Name	Roundabout Capacity Model	Description	Include In Report	Use Specific Demand Set(s)	Specific Demand Set (s)	Locked	Network Flow Scaling Factor (%)	Network Capacity Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	ARCADY		✓				100.000	100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Results For Central Hour Only	Single Time Segment Only	Locked	Run Automatically	Use Relationship	Relationship
2019 Base, AM	2019 Base	AM		ONE HOUR	08:00	09:30	90	15				✓		

Junction Network

Junctions

Junction	Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Do Geometric Delay	Junction Delay (s)	Junction LOS
1	(untitled)	Roundabout	A,B,C				5.96	A

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description
A	A	A59 North	
B	B	A671	
C	C	A59 South	

Capacity Options

Arm	Minimum Capacity (PCU/hr)	Maximum Capacity (PCU/hr)	Assume Flat Start Profile	Initial Queue (PCU)
A	0.00	99999.00		0.00
B	0.00	99999.00		0.00
C	0.00	99999.00		0.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
A	7.40	7.40	0.00	40.00	93.00	23.00	
B	3.90	7.30	37.00	57.00	93.00	7.00	
C	6.60	6.60	0.00	42.00	93.00	29.00	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
A		(calculated)	(calculated)	0.556	2351.485
B		(calculated)	(calculated)	0.548	2198.431
C		(calculated)	(calculated)	0.510	2057.963

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	ONE HOUR	✓	1350.00	100.000
B	ONE HOUR	✓	1042.00	100.000
C	ONE HOUR	✓	984.00	100.000

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.000	619.000	731.000
	B	894.000	0.000	148.000
	C	793.000	191.000	0.000

Turning Proportions (PCU) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.00	0.46	0.54
	B	0.86	0.00	0.14
	C	0.81	0.19	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

From	To		
	A	B	C
A	0.0	0.0	0.0
B	0.0	0.0	0.0
C	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)	Total Queueing Delay (PCU-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (PCU-min/min)	Inclusive Total Queueing Delay (PCU-min)	Inclusive Average Queueing Delay (s)
A	0.67	4.81	1.97	A	1238.78	1858.18	116.99	3.78	1.30	117.00	3.78
B	0.65	5.89	1.86	A	956.16	1434.24	106.69	4.46	1.19	106.70	4.46
C	0.70	7.61	2.26	A	902.94	1354.40	123.03	5.45	1.37	123.04	5.45

Main Results for each time segment

Main results: (08:00-08:15)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1016.35	254.09	1013.13	1265.23	143.21	0.00	2271.87	2202.42	0.447	0.00	0.80	2.853	A
B	784.47	196.12	781.67	607.75	548.59	0.00	1897.95	1545.22	0.413	0.00	0.70	3.217	A
C	740.81	185.20	737.79	659.62	670.65	0.00	1715.74	1381.45	0.432	0.00	0.75	3.671	A

Main results: (08:15-08:30)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1213.62	303.41	1212.22	1514.19	171.40	0.00	2256.20	2202.42	0.538	0.80	1.15	3.444	A
B	936.74	234.18	935.42	727.23	656.40	0.00	1838.90	1545.22	0.509	0.70	1.03	3.979	A
C	884.60	221.15	883.03	789.26	802.56	0.00	1648.43	1381.45	0.537	0.75	1.15	4.694	A

Main results: (08:30-08:45)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1486.38	371.59	1483.18	1851.14	209.45	0.00	2235.05	2202.42	0.665	1.15	1.95	4.768	A
B	1147.26	286.82	1144.01	889.52	803.11	0.00	1758.54	1545.22	0.652	1.03	1.84	5.826	A
C	1083.40	270.85	1079.08	965.60	981.52	0.00	1557.10	1381.45	0.696	1.15	2.23	7.465	A

Main results: (08:45-09:00)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1486.38	371.59	1486.31	1857.25	210.27	0.00	2234.60	2202.42	0.665	1.95	1.97	4.810	A
B	1147.26	286.82	1147.19	891.77	804.81	0.00	1757.61	1545.22	0.653	1.84	1.86	5.895	A
C	1083.40	270.85	1083.27	967.75	984.25	0.00	1555.71	1381.45	0.696	2.23	2.26	7.615	A

Main results: (09:00-09:15)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1213.62	303.41	1216.81	1522.87	172.55	0.00	2255.56	2202.42	0.538	1.97	1.17	3.478	A
B	936.74	234.18	939.99	730.48	658.88	0.00	1837.54	1545.22	0.510	1.86	1.05	4.026	A
C	884.60	221.15	888.94	792.39	806.48	0.00	1646.43	1381.45	0.537	2.26	1.17	4.780	A

Main results: (09:15-09:30)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1016.35	254.09	1017.79	1272.54	144.11	0.00	2271.37	2202.42	0.447	1.17	0.81	2.874	A
B	784.47	196.12	785.83	610.79	551.11	0.00	1896.57	1545.22	0.414	1.05	0.71	3.244	A
C	740.81	185.20	742.44	662.73	674.22	0.00	1713.92	1381.45	0.432	1.17	0.77	3.710	A

Queueing Delay Results for each time segment
Queueing Delay results: (08:00-08:15)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	11.80	0.79	2.853	A	A
B	10.25	0.68	3.217	A	A
C	11.01	0.73	3.671	A	A

Queueing Delay results: (08:15-08:30)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	16.94	1.13	3.444	A	A
B	15.07	1.00	3.979	A	A
C	16.70	1.11	4.694	A	A

Queueing Delay results: (08:30-08:45)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	28.24	1.88	4.768	A	A
B	26.48	1.77	5.826	A	A
C	31.58	2.11	7.465	A	A

Queueing Delay results: (08:45-09:00)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	29.47	1.96	4.810	A	A
B	27.82	1.85	5.895	A	A
C	33.72	2.25	7.615	A	A

Queueing Delay results: (09:00-09:15)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	18.10	1.21	3.478	A	A
B	16.21	1.08	4.026	A	A
C	18.25	1.22	4.780	A	A

Queueing Delay results: (09:15-09:30)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	12.45	0.83	2.874	A	A
B	10.86	0.72	3.244	A	A
C	11.77	0.78	3.710	A	A

(Default Analysis Set) - 2019 Base, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm B - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Analysis Set Details

Name	Roundabout Capacity Model	Description	Include In Report	Use Specific Demand Set(s)	Specific Demand Set (s)	Locked	Network Flow Scaling Factor (%)	Network Capacity Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	ARCADY		✓				100.000	100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Results For Central Hour Only	Single Time Segment Only	Locked	Run Automatically	Use Relationship	Relationship
2019 Base, PM	2019 Base	PM		ONE HOUR	16:30	18:00	90	15				✓		

Junction Network

Junctions

Junction	Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Do Geometric Delay	Junction Delay (s)	Junction LOS
1	(untitled)	Roundabout	A,B,C				5.68	A

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description
A	A	A59 North	
B	B	A671	
C	C	A59 South	

Capacity Options

Arm	Minimum Capacity (PCU/hr)	Maximum Capacity (PCU/hr)	Assume Flat Start Profile	Initial Queue (PCU)
A	0.00	99999.00		0.00
B	0.00	99999.00		0.00
C	0.00	99999.00		0.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
A	7.40	7.40	0.00	40.00	93.00	23.00	
B	3.90	7.30	37.00	57.00	93.00	7.00	
C	6.60	6.60	0.00	42.00	93.00	29.00	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
A		(calculated)	(calculated)	0.556	2351.485
B		(calculated)	(calculated)	0.548	2198.431
C		(calculated)	(calculated)	0.510	2057.963

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	ONE HOUR	✓	1539.00	100.000
B	ONE HOUR	✓	863.00	100.000
C	ONE HOUR	✓	892.00	100.000

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.000	810.000	729.000
	B	707.000	0.000	156.000
	C	711.000	181.000	0.000

Turning Proportions (PCU) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.00	0.53	0.47
	B	0.82	0.00	0.18
	C	0.80	0.20	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)	Total Queueing Delay (PCU-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (PCU-min/min)	Inclusive Total Queueing Delay (PCU-min)	Inclusive Average Queueing Delay (s)
A	0.76	6.58	3.06	A	1412.21	2118.32	166.80	4.72	1.85	166.82	4.72
B	0.54	4.45	1.17	A	791.90	1187.86	71.93	3.63	0.80	71.93	3.63
C	0.59	5.30	1.44	A	818.51	1227.77	86.06	4.21	0.96	86.06	4.21

Main Results for each time segment

Main results: (16:30-16:45)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1158.64	289.66	1154.52	1063.94	135.78	0.00	2276.00	2196.15	0.509	0.00	1.03	3.198	A
B	649.71	162.43	647.64	743.42	546.88	0.00	1898.89	1628.64	0.342	0.00	0.52	2.872	A
C	671.54	167.89	669.15	663.95	530.57	0.00	1787.22	1377.11	0.376	0.00	0.60	3.213	A

Main results: (16:45-17:00)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1383.53	345.88	1381.41	1273.26	162.51	0.00	2261.15	2196.15	0.612	1.03	1.56	4.082	A
B	775.82	193.95	774.99	889.57	654.35	0.00	1840.02	1628.64	0.422	0.52	0.72	3.375	A
C	801.89	200.47	800.87	794.44	634.90	0.00	1733.98	1377.11	0.462	0.60	0.85	3.854	A

Main results: (17:00-17:15)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1694.47	423.62	1688.65	1557.99	198.82	0.00	2240.96	2196.15	0.756	1.56	3.01	6.450	A
B	950.18	237.55	948.44	1087.58	799.89	0.00	1760.31	1628.64	0.540	0.72	1.16	4.424	A
C	982.11	245.53	979.82	971.33	776.99	0.00	1661.47	1377.11	0.591	0.85	1.43	5.263	A

Main results: (17:15-17:30)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1694.47	423.62	1694.30	1561.19	199.28	0.00	2240.71	2196.15	0.756	3.01	3.06	6.582	A
B	950.18	237.55	950.15	1091.01	802.56	0.00	1758.84	1628.64	0.540	1.16	1.17	4.451	A
C	982.11	245.53	982.07	974.32	778.40	0.00	1660.75	1377.11	0.591	1.43	1.44	5.304	A

Main results: (17:30-17:45)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1383.53	345.88	1389.38	1277.98	163.18	0.00	2260.77	2196.15	0.612	3.06	1.60	4.159	A
B	775.82	193.95	777.55	894.43	658.13	0.00	1837.96	1628.64	0.422	1.17	0.74	3.402	A
C	801.89	200.47	804.16	798.68	637.00	0.00	1732.91	1377.11	0.463	1.44	0.87	3.885	A

Main results: (17:45-18:00)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1158.64	289.66	1160.84	1069.07	136.48	0.00	2275.62	2196.15	0.509	1.60	1.04	3.237	A
B	649.71	162.43	650.56	747.45	549.87	0.00	1897.25	1628.64	0.342	0.74	0.52	2.888	A
C	671.54	167.89	672.59	667.47	532.96	0.00	1786.00	1377.11	0.376	0.87	0.61	3.238	A

Queueing Delay Results for each time segment

Queueing Delay results: (16:30-16:45)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	15.02	1.00	3.198	A	A
B	7.61	0.51	2.872	A	A
C	8.77	0.58	3.213	A	A

Queueing Delay results: (16:45-17:00)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	22.71	1.51	4.082	A	A
B	10.66	0.71	3.375	A	A
C	12.53	0.84	3.854	A	A

Queueing Delay results: (17:00-17:15)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	42.62	2.84	6.450	A	A
B	16.92	1.13	4.424	A	A
C	20.64	1.38	5.263	A	A

Queueing Delay results: (17:15-17:30)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	45.60	3.04	6.582	A	A
B	17.48	1.17	4.451	A	A
C	21.49	1.43	5.304	A	A

Queueing Delay results: (17:30-17:45)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	24.80	1.65	4.159	A	A
B	11.27	0.75	3.402	A	A
C	13.37	0.89	3.885	A	A

Queueing Delay results: (17:45-18:00)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	16.04	1.07	3.237	A	A
B	7.98	0.53	2.888	A	A
C	9.26	0.62	3.238	A	A

(Default Analysis Set) - 2024 Base, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm B - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Analysis Set Details

Name	Roundabout Capacity Model	Description	Include In Report	Use Specific Demand Set(s)	Specific Demand Set (s)	Locked	Network Flow Scaling Factor (%)	Network Capacity Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	ARCADY		✓				100.000	100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Results For Central Hour Only	Single Time Segment Only	Locked	Run Automatically	Use Relationship	Relationship
2024 Base, AM	2024 Base	AM		ONE HOUR	08:00	09:30	90	15				✓		

Junction Network

Junctions

Junction	Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Do Geometric Delay	Junction Delay (s)	Junction LOS
1	(untitled)	Roundabout	A,B,C				6.52	A

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description
A	A	A59 North	
B	B	A671	
C	C	A59 South	

Capacity Options

Arm	Minimum Capacity (PCU/hr)	Maximum Capacity (PCU/hr)	Assume Flat Start Profile	Initial Queue (PCU)
A	0.00	99999.00		0.00
B	0.00	99999.00		0.00
C	0.00	99999.00		0.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
A	7.40	7.40	0.00	40.00	93.00	23.00	
B	3.90	7.30	37.00	57.00	93.00	7.00	
C	6.60	6.60	0.00	42.00	93.00	29.00	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
A		(calculated)	(calculated)	0.556	2351.485
B		(calculated)	(calculated)	0.548	2198.431
C		(calculated)	(calculated)	0.510	2057.963

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	ONE HOUR	✓	1394.00	100.000
B	ONE HOUR	✓	1073.00	100.000
C	ONE HOUR	✓	1014.00	100.000

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	3.000	638.000	753.000
	B	921.000	0.000	152.000
	C	817.000	197.000	0.000

Turning Proportions (PCU) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.00	0.46	0.54
	B	0.86	0.00	0.14
	C	0.81	0.19	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To		
From		A	B	C
	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To		
From		A	B	C
	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)	Total Queueing Delay (PCU-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (PCU-min/min)	Inclusive Total Queueing Delay (PCU-min)	Inclusive Average Queueing Delay (s)
A	0.69	5.17	2.18	A	1279.16	1918.74	127.29	3.98	1.41	127.30	3.98
B	0.68	6.41	2.08	A	984.60	1476.91	116.64	4.74	1.30	116.65	4.74
C	0.73	8.51	2.60	A	930.46	1395.70	136.92	5.89	1.52	136.93	5.89

Main Results for each time segment

Main results: (08:00-08:15)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1049.48	262.37	1046.06	1305.56	147.69	0.00	2269.39	2202.53	0.462	0.00	0.86	2.934	A
B	807.81	201.95	804.84	626.44	567.30	0.00	1887.70	1544.18	0.428	0.00	0.74	3.317	A
C	763.39	190.85	760.17	679.06	693.08	0.00	1704.29	1379.19	0.448	0.00	0.81	3.801	A

Main results: (08:15-08:30)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1253.18	313.29	1251.63	1562.45	176.76	0.00	2253.23	2202.53	0.556	0.86	1.24	3.594	A
B	964.60	241.15	963.14	749.60	678.79	0.00	1826.64	1544.18	0.528	0.74	1.11	4.162	A
C	911.57	227.89	909.80	812.53	829.40	0.00	1634.73	1379.19	0.558	0.81	1.25	4.954	A

Main results: (08:30-08:45)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1534.82	383.71	1531.13	1909.41	215.89	0.00	2231.47	2202.53	0.688	1.24	2.16	5.114	A
B	1181.40	295.35	1177.60	916.65	830.37	0.00	1743.61	1544.18	0.678	1.11	2.06	6.317	A
C	1116.43	279.11	1111.22	993.89	1014.08	0.00	1540.49	1379.19	0.725	1.25	2.55	8.286	A

Main results: (08:45-09:00)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1534.82	383.71	1534.74	1916.64	216.86	0.00	2230.93	2202.53	0.688	2.16	2.18	5.169	A
B	1181.40	295.35	1181.30	919.28	832.33	0.00	1742.54	1544.18	0.678	2.06	2.08	6.412	A
C	1116.43	279.11	1116.24	996.37	1017.26	0.00	1538.87	1379.19	0.725	2.55	2.60	8.508	A

Main results: (09:00-09:15)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1253.18	313.29	1256.86	1572.64	178.12	0.00	2252.47	2202.53	0.556	2.18	1.27	3.631	A
B	964.60	241.15	968.40	753.35	681.62	0.00	1825.09	1544.18	0.529	2.08	1.13	4.221	A
C	911.57	227.89	916.83	816.10	833.93	0.00	1632.42	1379.19	0.558	2.60	1.28	5.068	A

Main results: (09:15-09:30)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1049.48	262.37	1051.07	1313.50	148.67	0.00	2268.84	2202.53	0.463	1.27	0.87	2.961	A
B	807.81	201.95	809.32	629.72	570.02	0.00	1886.21	1544.18	0.428	1.13	0.75	3.349	A
C	763.39	190.85	765.24	682.41	696.94	0.00	1702.32	1379.19	0.448	1.28	0.82	3.850	A

Queueing Delay Results for each time segment
Queueing Delay results: (08:00-08:15)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	12.52	0.83	2.934	A	A
B	10.87	0.72	3.317	A	A
C	11.73	0.78	3.801	A	A

Queueing Delay results: (08:15-08:30)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	18.19	1.21	3.594	A	A
B	16.20	1.08	4.162	A	A
C	18.11	1.21	4.954	A	A

Queueing Delay results: (08:30-08:45)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	31.13	2.08	5.114	A	A
B	29.40	1.96	6.317	A	A
C	35.83	2.39	8.286	A	A

Queueing Delay results: (08:45-09:00)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	32.65	2.18	5.169	A	A
B	31.08	2.07	6.412	A	A
C	38.68	2.58	8.508	A	A

Queueing Delay results: (09:00-09:15)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	19.54	1.30	3.631	A	A
B	17.53	1.17	4.221	A	A
C	19.97	1.33	5.068	A	A

Queueing Delay results: (09:15-09:30)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	13.25	0.88	2.961	A	A
B	11.55	0.77	3.349	A	A
C	12.60	0.84	3.850	A	A

(Default Analysis Set) - 2024 Base, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm B - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Analysis Set Details

Name	Roundabout Capacity Model	Description	Include In Report	Use Specific Demand Set(s)	Specific Demand Set (s)	Locked	Network Flow Scaling Factor (%)	Network Capacity Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	ARCADY		✓				100.000	100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Results For Central Hour Only	Single Time Segment Only	Locked	Run Automatically	Use Relationship	Relationship
2024 Base, PM	2024 Base	PM		ONE HOUR	16:30	18:00	90	15				✓		

Junction Network

Junctions

Junction	Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Do Geometric Delay	Junction Delay (s)	Junction LOS
1	(untitled)	Roundabout	A,B,C				6.20	A

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description
A	A	A59 North	
B	B	A671	
C	C	A59 South	

Capacity Options

Arm	Minimum Capacity (PCU/hr)	Maximum Capacity (PCU/hr)	Assume Flat Start Profile	Initial Queue (PCU)
A	0.00	99999.00		0.00
B	0.00	99999.00		0.00
C	0.00	99999.00		0.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
A	7.40	7.40	0.00	40.00	93.00	23.00	
B	3.90	7.30	37.00	57.00	93.00	7.00	
C	6.60	6.60	0.00	42.00	93.00	29.00	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
A		(calculated)	(calculated)	0.556	2351.485
B		(calculated)	(calculated)	0.548	2198.431
C		(calculated)	(calculated)	0.510	2057.963

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	ONE HOUR	✓	1588.00	100.000
B	ONE HOUR	✓	889.00	100.000
C	ONE HOUR	✓	918.00	100.000

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	3.000	834.000	751.000
	B	728.000	0.000	161.000
	C	732.000	186.000	0.000

Turning Proportions (PCU) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.00	0.53	0.47
	B	0.82	0.00	0.18
	C	0.80	0.20	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)	Total Queueing Delay (PCU-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (PCU-min/min)	Inclusive Total Queueing Delay (PCU-min)	Inclusive Average Queueing Delay (s)
A	0.78	7.35	3.51	A	1457.18	2185.76	185.65	5.10	2.06	185.67	5.10
B	0.56	4.71	1.27	A	815.76	1223.64	77.21	3.79	0.86	77.22	3.79
C	0.61	5.65	1.57	A	842.37	1263.56	92.81	4.41	1.03	92.82	4.41

Main Results for each time segment

Main results: (16:30-16:45)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1195.53	298.88	1191.13	1097.61	139.52	0.00	2273.93	2196.51	0.526	0.00	1.10	3.311	A
B	669.29	167.32	667.10	765.09	565.56	0.00	1888.66	1627.19	0.354	0.00	0.55	2.942	A
C	691.12	172.78	688.59	684.12	548.54	0.00	1778.05	1375.88	0.389	0.00	0.63	3.298	A

Main results: (16:45-17:00)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1427.58	356.89	1425.20	1313.57	166.98	0.00	2258.66	2196.51	0.632	1.10	1.70	4.307	A
B	799.19	199.80	798.29	915.48	676.70	0.00	1827.78	1627.19	0.437	0.55	0.77	3.493	A
C	825.26	206.32	824.14	818.58	656.41	0.00	1723.00	1375.88	0.479	0.63	0.91	4.000	A

Main results: (17:00-17:15)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1748.42	437.11	1741.41	1607.10	204.26	0.00	2237.93	2196.51	0.781	1.70	3.45	7.149	A
B	978.81	244.70	976.85	1118.83	826.84	0.00	1745.55	1627.19	0.561	0.77	1.26	4.670	A
C	1010.74	252.68	1008.14	1000.46	803.23	0.00	1648.08	1375.88	0.613	0.91	1.56	5.603	A

Main results: (17:15-17:30)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1748.42	437.11	1748.18	1610.72	204.78	0.00	2237.65	2196.51	0.781	3.45	3.51	7.346	A
B	978.81	244.70	978.77	1122.90	830.05	0.00	1743.78	1627.19	0.561	1.26	1.27	4.705	A
C	1010.74	252.68	1010.68	1004.01	804.81	0.00	1647.27	1375.88	0.614	1.56	1.57	5.655	A

Main results: (17:30-17:45)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1427.58	356.89	1434.65	1318.88	167.73	0.00	2258.24	2196.51	0.632	3.51	1.74	4.409	A
B	799.19	199.80	801.14	921.20	681.19	0.00	1825.32	1627.19	0.438	1.27	0.78	3.520	A
C	825.26	206.32	827.85	823.57	658.76	0.00	1721.80	1375.88	0.479	1.57	0.93	4.038	A

Main results: (17:45-18:00)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1195.53	298.88	1198.02	1103.11	140.26	0.00	2273.51	2196.51	0.526	1.74	1.12	3.356	A
B	669.29	167.32	670.21	769.45	568.83	0.00	1886.86	1627.19	0.355	0.78	0.55	2.960	A
C	691.12	172.78	692.27	687.95	551.10	0.00	1776.74	1375.88	0.389	0.93	0.64	3.324	A

Queueing Delay Results for each time segment
Queueing Delay results: (16:30-16:45)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	16.03	1.07	3.311	A	A
B	8.02	0.53	2.942	A	A
C	9.25	0.62	3.298	A	A

Queueing Delay results: (16:45-17:00)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	24.65	1.64	4.307	A	A
B	11.35	0.76	3.493	A	A
C	13.36	0.89	4.000	A	A

Queueing Delay results: (17:00-17:15)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	48.34	3.22	7.149	A	A
B	18.35	1.22	4.670	A	A
C	22.53	1.50	5.603	A	A

Queueing Delay results: (17:15-17:30)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	52.28	3.49	7.346	A	A
B	19.02	1.27	4.705	A	A
C	23.54	1.57	5.655	A	A

Queueing Delay results: (17:30-17:45)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	27.17	1.81	4.409	A	A
B	12.04	0.80	3.520	A	A
C	14.32	0.95	4.038	A	A

Queueing Delay results: (17:45-18:00)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	17.18	1.15	3.356	A	A
B	8.43	0.56	2.960	A	A
C	9.80	0.65	3.324	A	A

(Default Analysis Set) - 2024 Base + Committed, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm B - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Analysis Set Details

Name	Roundabout Capacity Model	Description	Include In Report	Use Specific Demand Set(s)	Specific Demand Set (s)	Locked	Network Flow Scaling Factor (%)	Network Capacity Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	ARCADY		✓				100.000	100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Results For Central Hour Only	Single Time Segment Only	Locked	Run Automatically	Use Relationship	Relati
2024 Base + Committed, AM	2024 Base + Committed	AM		ONE HOUR	08:00	09:30	90	15				✓		

Junction Network

Junctions

Junction	Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Do Geometric Delay	Junction Delay (s)	Junction LOS
1	(untitled)	Roundabout	A,B,C				11.58	B

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description
A	A	A59 North	
B	B	A671	
C	C	A59 South	

Capacity Options

Arm	Minimum Capacity (PCU/hr)	Maximum Capacity (PCU/hr)	Assume Flat Start Profile	Initial Queue (PCU)
A	0.00	99999.00		0.00
B	0.00	99999.00		0.00
C	0.00	99999.00		0.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
A	7.40	7.40	0.00	40.00	93.00	23.00	
B	3.90	7.30	37.00	57.00	93.00	7.00	
C	6.60	6.60	0.00	42.00	93.00	29.00	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
A		(calculated)	(calculated)	0.556	2351.485
B		(calculated)	(calculated)	0.548	2198.431
C		(calculated)	(calculated)	0.510	2057.963

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	ONE HOUR	✓	1739.00	100.000
B	ONE HOUR	✓	1178.00	100.000
C	ONE HOUR	✓	1102.00	100.000

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	3.000	817.000	919.000
	B	1026.000	0.000	152.000
	C	905.000	197.000	0.000

Turning Proportions (PCU) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.00	0.47	0.53
	B	0.87	0.00	0.13
	C	0.82	0.18	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To		
From		A	B	C
	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To		
From		A	B	C
	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)	Total Queueing Delay (PCU-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (PCU-min/min)	Inclusive Total Queueing Delay (PCU-min)	Inclusive Average Queueing Delay (s)
A	0.86	11.27	5.80	B	1595.74	2393.61	270.42	6.78	3.00	270.44	6.78
B	0.79	10.37	3.65	B	1080.95	1621.43	178.06	6.59	1.98	178.07	6.59
C	0.82	13.37	4.36	B	1011.21	1516.82	201.16	7.96	2.24	201.18	7.96

Main Results for each time segment

Main results: (08:00-08:15)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1309.21	327.30	1303.81	1449.49	147.61	0.00	2269.43	2215.84	0.577	0.00	1.35	3.707	A
B	886.86	221.72	883.09	760.15	691.27	0.00	1819.80	1554.95	0.487	0.00	0.94	3.828	A
C	829.64	207.41	825.71	802.96	771.39	0.00	1664.33	1364.92	0.498	0.00	0.98	4.273	A

Main results: (08:15-08:30)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1563.33	390.83	1559.83	1734.48	176.64	0.00	2253.29	2215.84	0.694	1.35	2.23	5.166	A
B	1059.00	264.75	1056.69	909.46	827.00	0.00	1745.46	1554.95	0.607	0.94	1.52	5.208	A
C	990.68	247.67	988.08	960.66	923.03	0.00	1586.95	1364.92	0.624	0.98	1.63	5.984	A

Main results: (08:30-08:45)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1914.67	478.67	1901.24	2113.98	215.08	0.00	2231.92	2215.84	0.858	2.23	5.58	10.482	B
B	1297.00	324.25	1288.95	1108.30	1008.02	0.00	1646.31	1554.95	0.788	1.52	3.53	9.858	A
C	1213.32	303.33	1203.14	1171.06	1125.92	0.00	1483.42	1364.92	0.818	1.63	4.18	12.416	B

Main results: (08:45-09:00)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1914.67	478.67	1913.80	2128.38	216.77	0.00	2230.98	2215.84	0.858	5.58	5.80	11.267	B
B	1297.00	324.25	1296.55	1115.89	1014.68	0.00	1642.66	1554.95	0.790	3.53	3.65	10.367	B
C	1213.32	303.33	1212.59	1178.67	1132.56	0.00	1480.03	1364.92	0.820	4.18	4.36	13.370	B

Main results: (09:00-09:15)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1563.33	390.83	1577.28	1754.59	179.00	0.00	2251.98	2215.84	0.694	5.80	2.31	5.443	A
B	1059.00	264.75	1067.27	920.02	836.26	0.00	1740.39	1554.95	0.608	3.65	1.58	5.413	A
C	990.68	247.67	1001.31	971.25	932.28	0.00	1582.23	1364.92	0.626	4.36	1.70	6.305	A

Main results: (09:15-09:30)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1309.21	327.30	1312.95	1460.46	148.81	0.00	2268.76	2215.84	0.577	2.31	1.38	3.783	A
B	886.86	221.72	889.32	765.65	696.11	0.00	1817.15	1554.95	0.488	1.58	0.96	3.891	A
C	829.64	207.41	832.43	808.60	776.84	0.00	1661.55	1364.92	0.499	1.70	1.01	4.356	A

Queueing Delay Results for each time segment
Queueing Delay results: (08:00-08:15)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	19.58	1.31	3.707	A	A
B	13.72	0.91	3.828	A	A
C	14.28	0.95	4.273	A	A

Queueing Delay results: (08:15-08:30)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	32.02	2.13	5.166	A	A
B	22.02	1.47	5.208	A	A
C	23.53	1.57	5.984	A	A

Queueing Delay results: (08:30-08:45)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	74.77	4.98	10.482	B	B
B	48.59	3.24	9.858	A	A
C	56.17	3.74	12.416	B	B

Queueing Delay results: (08:45-09:00)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	85.73	5.72	11.267	B	B
B	54.05	3.60	10.367	B	B
C	64.37	4.29	13.370	B	B

Queueing Delay results: (09:00-09:15)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	37.02	2.47	5.443	A	A
B	24.87	1.66	5.413	A	A
C	27.26	1.82	6.305	A	A

Queueing Delay results: (09:15-09:30)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	21.30	1.42	3.783	A	A
B	14.81	0.99	3.891	A	A
C	15.56	1.04	4.356	A	A

(Default Analysis Set) - 2024 Base + Committed, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm B - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Analysis Set Details

Name	Roundabout Capacity Model	Description	Include In Report	Use Specific Demand Set(s)	Specific Demand Set (s)	Locked	Network Flow Scaling Factor (%)	Network Capacity Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	ARCADY		✓				100.000	100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Results For Central Hour Only	Single Time Segment Only	Locked	Run Automatically	Use Relationship	Relati
2024 Base + Committed, PM	2024 Base + Committed	PM		ONE HOUR	16:30	18:00	90	15				✓		

Junction Network

Junctions

Junction	Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Do Geometric Delay	Junction Delay (s)	Junction LOS
1	(untitled)	Roundabout	A,B,C				10.73	B

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description
A	A	A59 North	
B	B	A671	
C	C	A59 South	

Capacity Options

Arm	Minimum Capacity (PCU/hr)	Maximum Capacity (PCU/hr)	Assume Flat Start Profile	Initial Queue (PCU)
A	0.00	99999.00		0.00
B	0.00	99999.00		0.00
C	0.00	99999.00		0.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
A	7.40	7.40	0.00	40.00	93.00	23.00	
B	3.90	7.30	37.00	57.00	93.00	7.00	
C	6.60	6.60	0.00	42.00	93.00	29.00	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
A		(calculated)	(calculated)	0.556	2351.485
B		(calculated)	(calculated)	0.548	2198.431
C		(calculated)	(calculated)	0.510	2057.963

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	ONE HOUR	✓	1801.00	100.000
B	ONE HOUR	✓	1064.00	100.000
C	ONE HOUR	✓	1055.00	100.000

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	3.000	958.000	840.000
	B	903.000	0.000	161.000
	C	869.000	186.000	0.000

Turning Proportions (PCU) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.00	0.53	0.47
	B	0.85	0.00	0.15
	C	0.82	0.18	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)	Total Queueing Delay (PCU-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (PCU-min/min)	Inclusive Total Queueing Delay (PCU-min)	Inclusive Average Queueing Delay (s)
A	0.89	13.84	7.31	B	1652.63	2478.94	319.63	7.74	3.55	319.66	7.74
B	0.69	6.93	2.23	A	976.34	1464.52	122.09	5.00	1.36	122.10	5.00
C	0.75	9.27	2.94	A	968.09	1452.13	151.02	6.24	1.68	151.03	6.24

Main Results for each time segment

Main results: (16:30-16:45)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1355.89	338.97	1350.04	1330.90	139.42	0.00	2273.98	2219.14	0.596	0.00	1.46	3.873	A
B	801.03	200.26	798.01	857.55	631.92	0.00	1852.31	1629.49	0.432	0.00	0.76	3.404	A
C	794.26	198.56	790.82	750.42	679.51	0.00	1711.22	1350.38	0.464	0.00	0.86	3.898	A

Main results: (16:45-17:00)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1619.06	404.77	1614.99	1592.76	166.87	0.00	2258.72	2219.14	0.717	1.46	2.48	5.557	A
B	956.51	239.13	954.97	1025.92	755.94	0.00	1784.38	1629.49	0.536	0.76	1.14	4.332	A
C	948.42	237.11	946.47	897.75	813.16	0.00	1643.02	1350.38	0.577	0.86	1.35	5.154	A

Main results: (17:00-17:15)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1982.94	495.73	1965.14	1945.72	203.71	0.00	2238.24	2219.14	0.886	2.48	6.93	12.442	B
B	1171.49	292.87	1167.31	1249.02	919.83	0.00	1694.61	1629.49	0.691	1.14	2.19	6.773	A
C	1161.58	290.39	1155.48	1093.19	993.95	0.00	1550.76	1350.38	0.749	1.35	2.87	8.971	A

Main results: (17:15-17:30)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1982.94	495.73	1981.41	1953.97	204.75	0.00	2237.67	2219.14	0.886	6.93	7.31	13.839	B
B	1171.49	292.87	1171.33	1258.71	927.45	0.00	1690.44	1629.49	0.693	2.19	2.23	6.930	A
C	1161.58	290.39	1161.32	1101.39	997.39	0.00	1549.00	1350.38	0.750	2.87	2.94	9.269	A

Main results: (17:30-17:45)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1619.06	404.77	1637.94	1604.38	168.30	0.00	2257.93	2219.14	0.717	7.31	2.59	5.977	A
B	956.51	239.13	960.72	1039.57	766.68	0.00	1778.50	1629.49	0.538	2.23	1.18	4.424	A
C	948.42	237.11	954.61	909.32	818.07	0.00	1640.51	1350.38	0.578	2.94	1.39	5.294	A

Main results: (17:45-18:00)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1355.89	338.97	1360.27	1339.39	140.39	0.00	2273.44	2219.14	0.596	2.59	1.49	3.962	A
B	801.03	200.26	802.66	863.96	636.71	0.00	1849.69	1629.49	0.433	1.18	0.77	3.445	A
C	794.26	198.56	796.31	755.90	683.47	0.00	1709.19	1350.38	0.465	1.39	0.88	3.952	A

Queueing Delay Results for each time segment
Queueing Delay results: (16:30-16:45)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	21.14	1.41	3.873	A	A
B	11.06	0.74	3.404	A	A
C	12.51	0.83	3.898	A	A

Queueing Delay results: (16:45-17:00)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	35.50	2.37	5.557	A	A
B	16.70	1.11	4.332	A	A
C	19.56	1.30	5.154	A	A

Queueing Delay results: (17:00-17:15)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	90.25	6.02	12.442	B	B
B	31.13	2.08	6.773	A	A
C	40.06	2.67	8.971	A	A

Queueing Delay results: (17:15-17:30)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	107.34	7.16	13.839	B	B
B	33.17	2.21	6.930	A	A
C	43.67	2.91	9.269	A	A

Queueing Delay results: (17:30-17:45)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	42.27	2.82	5.977	A	A
B	18.24	1.22	4.424	A	A
C	21.75	1.45	5.294	A	A

Queueing Delay results: (17:45-18:00)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	23.15	1.54	3.962	A	A
B	11.79	0.79	3.445	A	A
C	13.47	0.90	3.952	A	A

Appendix K – A59 / A671 / Site Access Modelling Outputs With Development

Junctions 8
ARCADY 8 - Roundabout Module
Version: 8.0.6.541 [19821,26/11/2015] © Copyright TRL Limited, 2020
For sales and distribution information, program advice and maintenance, contact TRL: Tel: +44 (0)1344 770758 email: software@trl.co.uk Web: http://www.trlsoftware.co.uk
The users of this computer program for the solution of an engineering problem are in no way relieved of their responsibility for the correctness of the solution

Filename: A671_A59 with Site Access 18.11.20.arc8
Path: N:\Vectos Job Data\2019\VN91274 Whalley, Clitheroe\Arcady
Report generation date: 20/11/2020 16:59:42

- » (Default Analysis Set) - Base 2024 + CD + Dev Sensitivity Test, AM
- » (Default Analysis Set) - Base 2024 + CD + Dev Sensitivity Test, PM
- » (Default Analysis Set) - Base 2024 + CD + Dev, AM
- » (Default Analysis Set) - Base 2024 + CD + Dev, PM

Summary of junction performance

	AM		PM	
	Queue (PCU)	RFC	Queue (PCU)	RFC
A1 - Base 2024 + CD + Dev				
Arm A	6.82	0.87	9.31	0.91
Arm B	4.47	0.81	2.53	0.72
Arm C	1.57	0.59	1.24	0.55
Arm D	0.10	0.09	0.15	0.13
A1 - Base 2024 + CD + Dev Sensitivity Test				
Arm A	6.93	0.87	9.68	0.91
Arm B	4.76	0.82	2.57	0.72
Arm C	1.64	0.60	1.25	0.55
Arm D	0.10	0.09	0.17	0.14

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

"D5 - Base 2024 + CD + Dev Sensitivity Test, AM" model duration: 08:00 - 09:30

"D6 - Base 2024 + CD + Dev Sensitivity Test, PM" model duration: 16:30 - 18:00

"D7 - Base 2024 + CD + Dev, AM" model duration: 08:00 - 09:30

"D8 - Base 2024 + CD + Dev, PM" model duration: 16:30 - 18:00

Run using Junctions 8.0.6.541 at 20/11/2020 16:59:39

File summary

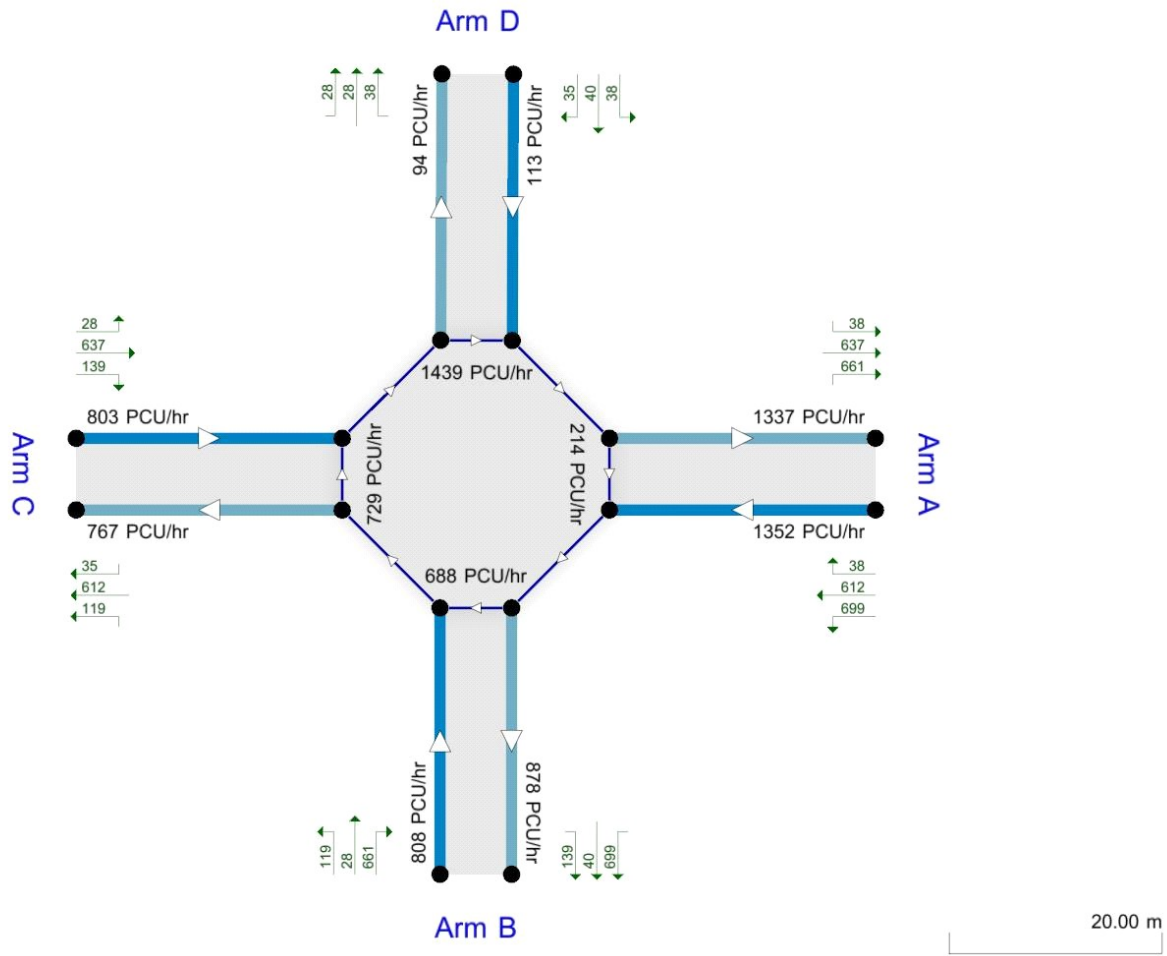
Title	(untitled)
Location	
Site Number	
Date	16/04/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	Office
Description	

Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	RFC Threshold	Average Delay Threshold (s)	Queue Threshold (PCU)
5.75			N/A	0.85	36.00	20.00

Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
m	kph	PCU	PCU	perHour	s	-Min	perMin



Showing modelled flow through junction (PCU/hr).
 Time Segment: (16:30-16:45)
 Showing Analysis Set "A1"; Demand Set "D5 - Base 2024 + CD + Dev Sensitivity Test, AM"

The junction diagram reflects the last run of ARCADY.

(Default Analysis Set) - Base 2024 + CD + Dev Sensitivity Test, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm B - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Analysis Set Details

Name	Roundabout Capacity Model	Description	Include In Report	Use Specific Demand Set(s)	Specific Demand Set (s)	Locked	Network Flow Scaling Factor (%)	Network Capacity Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	ARCADY		✓				100.000	100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Results For Central Hour Only	Single Time Segment Only	Locked	Run Automatically	Use Relationship	Relatio
Base 2024 + CD + Dev Sensitivity Test, AM	Base 2024 + CD + Dev Sensitivity Test	AM		ONE HOUR	08:00	09:30	90	15				✓		

Junction Network

Junctions

Junction	Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Do Geometric Delay	Junction Delay (s)	Junction LOS
1	(untitled)	Roundabout	A,B,C,D				10.88	B

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description
A	A	A59 North	
B	B	A671	
C	C	A59 South	
D	D	Site Access	

Capacity Options

Arm	Minimum Capacity (PCU/hr)	Maximum Capacity (PCU/hr)	Assume Flat Start Profile	Initial Queue (PCU)
A	0.00	99999.00		0.00
B	0.00	99999.00		0.00
C	0.00	99999.00		0.00
D	0.00	99999.00		0.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
A	7.40	7.40	0.00	40.00	93.00	23.00	
B	3.90	7.30	37.00	57.00	93.00	7.00	
C	8.80	8.80	0.00	42.00	93.00	23.00	
D	4.70	8.60	30.00	35.00	93.00	29.00	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
A		(calculated)	(calculated)	0.556	2351.485
B		(calculated)	(calculated)	0.548	2198.431
C		(calculated)	(calculated)	0.619	2799.465
D		(calculated)	(calculated)	0.545	2313.806

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	ONE HOUR	✓	1746.00	100.000
B	ONE HOUR	✓	1209.00	100.000
C	ONE HOUR	✓	1127.00	100.000
D	ONE HOUR	✓	86.00	100.000

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction 1 (for whole period)

		To			
		A	B	C	D
From	A	3.000	804.000	904.000	35.000
	B	1008.000	0.000	155.000	46.000
	C	889.000	196.000	0.000	42.000
	D	36.000	25.000	25.000	0.000

Turning Proportions (PCU) - Junction 1 (for whole period)

		To			
		A	B	C	D
From	A	0.00	0.46	0.52	0.02
	B	0.83	0.00	0.13	0.04
	C	0.79	0.17	0.00	0.04
	D	0.42	0.29	0.29	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To			
From		A	B	C	D
	A	1.500	1.049	1.074	1.000
	B	1.068	1.000	1.041	1.000
	C	1.090	1.066	1.000	1.000
	D	1.000	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To			
From		A	B	C	D
	A	50.0	4.9	7.4	0.0
	B	6.8	0.0	4.1	0.0
	C	9.0	6.6	0.0	0.0
	D	0.0	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)	Total Queueing Delay (PCU-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (PCU-min/min)	Inclusive Total Queueing Delay (PCU-min)	Inclusive Average Queueing Delay (s)
A	0.87	13.49	6.93	B	1602.16	2403.24	311.02	7.77	3.46	311.05	7.77
B	0.82	13.30	4.76	B	1109.40	1664.10	219.22	7.90	2.44	219.24	7.90
C	0.60	4.78	1.64	A	1034.15	1551.23	94.98	3.67	1.06	94.99	3.67
D	0.09	3.74	0.10	A	78.92	118.37	6.23	3.16	0.07	6.23	3.16

Main Results for each time segment

Main results: (08:00-08:15)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1314.48	328.62	1308.57	1451.86	184.65	0.00	2248.84	1970.34	0.585	0.00	1.48	4.039	A
B	910.20	227.55	905.90	768.46	724.77	0.00	1801.45	1521.35	0.505	0.00	1.07	4.248	A
C	848.46	212.12	845.93	812.43	818.24	0.00	2292.69	1951.46	0.370	0.00	0.63	2.688	A
D	64.75	16.19	64.56	92.22	1571.95	0.00	1456.48	595.53	0.044	0.00	0.05	2.586	A

Main results: (08:15-08:30)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1569.62	392.40	1565.62	1737.11	220.91	0.00	2228.68	1970.35	0.704	1.48	2.48	5.728	A
B	1086.87	271.72	1084.04	919.39	867.14	0.00	1723.47	1521.35	0.631	1.07	1.78	5.951	A
C	1013.15	253.29	1011.99	972.04	979.13	0.00	2193.04	1951.46	0.462	0.63	0.92	3.295	A
D	77.31	19.33	77.24	110.34	1880.78	0.00	1288.05	595.53	0.060	0.05	0.06	2.972	A

Main results: (08:30-08:45)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1922.38	480.60	1905.85	2120.09	270.29	0.00	2201.23	1970.33	0.873	2.48	6.61	12.298	B
B	1331.13	332.78	1320.08	1120.41	1055.73	0.00	1620.18	1521.35	0.822	1.78	4.54	12.306	B
C	1240.85	310.21	1238.08	1183.49	1192.32	0.00	2061.00	1951.46	0.602	0.92	1.62	4.717	A
D	94.69	23.67	94.55	134.57	2295.83	0.00	1061.69	595.53	0.089	0.06	0.10	3.721	A

Main results: (08:45-09:00)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1922.38	480.60	1921.09	2130.80	270.84	0.00	2200.93	1970.33	0.873	6.61	6.93	13.493	B
B	1331.13	332.78	1330.29	1127.94	1063.99	0.00	1615.65	1521.35	0.824	4.54	4.76	13.299	B
C	1240.85	310.21	1240.77	1192.73	1201.55	0.00	2055.29	1951.46	0.604	1.62	1.64	4.782	A
D	94.69	23.67	94.68	135.36	2306.96	0.00	1055.62	595.53	0.090	0.10	0.10	3.745	A

Main results: (09:00-09:15)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1569.62	392.40	1587.00	1752.35	221.71	0.00	2228.24	1970.35	0.704	6.93	2.58	6.115	A
B	1086.87	271.72	1098.44	929.98	878.73	0.00	1717.12	1521.35	0.633	4.76	1.86	6.291	A
C	1013.15	253.29	1015.92	985.02	992.15	0.00	2184.98	1951.46	0.464	1.64	0.94	3.339	A
D	77.31	19.33	77.45	111.47	1896.61	0.00	1279.41	595.53	0.060	0.10	0.06	2.994	A

Main results: (09:15-09:30)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1314.48	328.62	1318.78	1461.06	185.45	0.00	2248.39	1970.34	0.585	2.58	1.51	4.130	A
B	910.20	227.55	913.26	773.88	730.35	0.00	1798.40	1521.35	0.506	1.86	1.10	4.332	A
C	848.46	212.12	849.67	818.73	824.88	0.00	2288.58	1951.46	0.371	0.94	0.64	2.709	A
D	64.75	16.19	64.82	92.85	1581.70	0.00	1451.16	595.53	0.045	0.06	0.05	2.598	A

Queueing Delay Results for each time segment
Queueing Delay results: (08:00-08:15)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	21.36	1.42	4.039	A	A
B	15.57	1.04	4.248	A	A
C	9.30	0.62	2.688	A	A
D	0.69	0.05	2.586	A	A

Queueing Delay results: (08:15-08:30)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	35.48	2.37	5.728	A	A
B	25.66	1.71	5.951	A	A
C	13.57	0.90	3.295	A	A
D	0.94	0.06	2.972	A	A

Queueing Delay results: (08:30-08:45)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	86.87	5.79	12.298	B	B
B	61.05	4.07	12.306	B	B
C	23.43	1.56	4.717	A	A
D	1.44	0.10	3.721	A	A

Queueing Delay results: (08:45-09:00)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	102.01	6.80	13.493	B	B
B	70.13	4.68	13.299	B	B
C	24.43	1.63	4.782	A	A
D	1.47	0.10	3.745	A	A

Queueing Delay results: (09:00-09:15)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	41.90	2.79	6.115	A	A
B	29.82	1.99	6.291	A	A
C	14.48	0.97	3.339	A	A
D	0.98	0.07	2.994	A	A

Queueing Delay results: (09:15-09:30)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	23.40	1.56	4.130	A	A
B	16.98	1.13	4.332	A	A
C	9.77	0.65	2.709	A	A
D	0.71	0.05	2.598	A	A

(Default Analysis Set) - Base 2024 + CD + Dev Sensitivity Test, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm B - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Analysis Set Details

Name	Roundabout Capacity Model	Description	Include In Report	Use Specific Demand Set(s)	Specific Demand Set (s)	Locked	Network Flow Scaling Factor (%)	Network Capacity Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	ARCADY		✓				100.000	100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Results For Central Hour Only	Single Time Segment Only	Locked	Run Automatically	Use Relationship	Relatio
Base 2024 + CD + Dev Sensitivity Test, PM	Base 2024 + CD + Dev Sensitivity Test	PM		ONE HOUR	16:30	18:00	90	15				✓		

Junction Network

Junctions

Junction	Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Do Geometric Delay	Junction Delay (s)	Junction LOS
1	(untitled)	Roundabout	A,B,C,D				11.37	B

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description
A	A	A59 North	
B	B	A671	
C	C	A59 South	
D	D	Site Access	

Capacity Options

Arm	Minimum Capacity (PCU/hr)	Maximum Capacity (PCU/hr)	Assume Flat Start Profile	Initial Queue (PCU)
A	0.00	99999.00		0.00
B	0.00	99999.00		0.00
C	0.00	99999.00		0.00
D	0.00	99999.00		0.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
A	7.40	7.40	0.00	40.00	93.00	23.00	
B	3.90	7.30	37.00	57.00	93.00	7.00	
C	8.80	8.80	0.00	42.00	93.00	23.00	
D	4.70	8.60	30.00	35.00	93.00	29.00	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
A		(calculated)	(calculated)	0.556	2351.485
B		(calculated)	(calculated)	0.548	2198.431
C		(calculated)	(calculated)	0.619	2799.465
D		(calculated)	(calculated)	0.545	2313.806

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	ONE HOUR	✓	1804.00	100.000
B	ONE HOUR	✓	1077.00	100.000
C	ONE HOUR	✓	1070.00	100.000
D	ONE HOUR	✓	150.00	100.000

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction 1 (for whole period)

		To			
		A	B	C	D
From	A	3.000	933.000	817.000	51.000
	B	881.000	0.000	159.000	37.000
	C	848.000	185.000	0.000	37.000
	D	50.000	53.000	47.000	0.000

Turning Proportions (PCU) - Junction 1 (for whole period)

		To			
		A	B	C	D
From	A	0.00	0.52	0.45	0.03
	B	0.82	0.00	0.15	0.03
	C	0.79	0.17	0.00	0.03
	D	0.33	0.35	0.31	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To			
From		A	B	C	D
	A	1.000	1.030	1.040	1.000
	B	1.018	1.000	1.006	1.000
	C	1.024	1.005	1.000	1.000
	D	1.000	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To			
From		A	B	C	D
	A	0.0	3.0	4.0	0.0
	B	1.8	0.0	0.6	0.0
	C	2.4	0.5	0.0	0.0
	D	0.0	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)	Total Queueing Delay (PCU-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (PCU-min/min)	Inclusive Total Queueing Delay (PCU-min)	Inclusive Average Queueing Delay (s)
A	0.91	18.53	9.68	C	1655.38	2483.07	389.79	9.42	4.33	389.82	9.42
B	0.72	7.94	2.57	A	988.27	1482.41	136.40	5.52	1.52	136.41	5.52
C	0.55	3.83	1.25	A	981.85	1472.78	75.47	3.07	0.84	75.47	3.07
D	0.14	3.61	0.17	A	137.64	206.46	10.56	3.07	0.12	10.56	3.07

Main Results for each time segment

Main results: (16:30-16:45)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1358.15	339.54	1351.80	1337.14	213.98	0.00	2232.53	1947.15	0.608	0.00	1.59	4.195	A
B	810.82	202.71	807.59	877.83	687.96	0.00	1821.62	1582.08	0.445	0.00	0.81	3.593	A
C	805.55	201.39	803.43	766.72	728.82	0.00	2348.07	1928.17	0.343	0.00	0.53	2.374	A
D	112.93	28.23	112.61	93.74	1438.51	0.00	1529.26	590.98	0.074	0.00	0.08	2.541	A

Main results: (16:45-17:00)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1621.76	405.44	1616.97	1599.80	255.98	0.00	2209.19	1947.15	0.734	1.59	2.78	6.231	A
B	968.20	242.05	966.45	1050.04	822.92	0.00	1747.69	1582.08	0.554	0.81	1.25	4.669	A
C	961.91	240.48	961.02	917.19	872.17	0.00	2259.29	1928.17	0.426	0.53	0.75	2.827	A
D	134.85	33.71	134.73	112.15	1721.05	0.00	1375.16	590.98	0.098	0.08	0.11	2.901	A

Main results: (17:00-17:15)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1986.24	496.56	1961.65	1956.22	313.31	0.00	2177.32	1947.15	0.912	2.78	8.93	15.724	C
B	1185.80	296.45	1180.74	1276.16	998.79	0.00	1651.36	1582.08	0.718	1.25	2.51	7.687	A
C	1178.09	294.52	1176.15	1114.39	1065.14	0.00	2139.77	1928.16	0.551	0.75	1.24	3.801	A
D	165.15	41.29	164.93	136.69	2104.60	0.00	1165.98	590.98	0.142	0.11	0.16	3.596	A

Main results: (17:15-17:30)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1986.24	496.56	1983.24	1961.79	313.78	0.00	2177.05	1947.15	0.912	8.93	9.68	18.534	C
B	1185.80	296.45	1185.56	1287.73	1009.29	0.00	1645.62	1582.08	0.721	2.51	2.57	7.938	A
C	1178.09	294.52	1178.06	1124.95	1069.90	0.00	2136.82	1928.16	0.551	1.24	1.25	3.828	A
D	165.15	41.29	165.15	137.53	2110.42	0.00	1162.80	590.98	0.142	0.16	0.17	3.607	A

Main results: (17:30-17:45)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1621.76	405.44	1648.77	1607.83	256.69	0.00	2208.79	1947.15	0.734	9.68	2.93	6.951	A
B	968.20	242.05	973.33	1067.09	838.37	0.00	1739.23	1582.08	0.557	2.57	1.29	4.806	A
C	961.91	240.48	963.84	932.71	878.99	0.00	2255.06	1928.17	0.427	1.25	0.76	2.849	A
D	134.85	33.71	135.07	113.38	1729.45	0.00	1370.58	590.98	0.098	0.17	0.11	2.913	A

Main results: (17:45-18:00)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1358.15	339.54	1363.37	1343.88	214.80	0.00	2232.08	1947.15	0.608	2.93	1.63	4.308	A
B	810.82	202.71	812.69	884.49	693.68	0.00	1818.48	1582.08	0.446	1.29	0.82	3.640	A
C	805.55	201.39	806.46	772.85	733.52	0.00	2345.16	1928.17	0.344	0.76	0.54	2.386	A
D	112.93	28.23	113.05	94.35	1445.63	0.00	1525.37	590.98	0.074	0.11	0.08	2.548	A

Queueing Delay Results for each time segment
Queueing Delay results: (16:30-16:45)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	22.88	1.53	4.195	A	A
B	11.80	0.79	3.593	A	A
C	7.82	0.52	2.374	A	A
D	1.17	0.08	2.541	A	A

Queueing Delay results: (16:45-17:00)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	39.61	2.64	6.231	A	A
B	18.16	1.21	4.669	A	A
C	11.09	0.74	2.827	A	A
D	1.61	0.11	2.901	A	A

Queueing Delay results: (17:00-17:15)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	111.79	7.45	15.724	C	B
B	35.45	2.36	7.687	A	A
C	18.08	1.21	3.801	A	A
D	2.43	0.16	3.596	A	A

Queueing Delay results: (17:15-17:30)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	140.61	9.37	18.534	C	B
B	38.25	2.55	7.938	A	A
C	18.65	1.24	3.828	A	A
D	2.47	0.16	3.607	A	A

Queueing Delay results: (17:30-17:45)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	49.62	3.31	6.951	A	A
B	20.08	1.34	4.806	A	A
C	11.67	0.78	2.849	A	A
D	1.67	0.11	2.913	A	A

Queueing Delay results: (17:45-18:00)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	25.27	1.68	4.308	A	A
B	12.64	0.84	3.640	A	A
C	8.15	0.54	2.386	A	A
D	1.22	0.08	2.548	A	A

(Default Analysis Set) - Base 2024 + CD + Dev, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm B - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Analysis Set Details

Name	Roundabout Capacity Model	Description	Include In Report	Use Specific Demand Set(s)	Specific Demand Set (s)	Locked	Network Flow Scaling Factor (%)	Network Capacity Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	ARCADY		✓				100.000	100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Results For Central Hour Only	Single Time Segment Only	Locked	Run Automatically	Use Relationship	Relationship
Base 2024 + CD + Dev, AM	Base 2024 + CD + Dev	AM		ONE HOUR	08:00	09:30	90	15				✓		

Junction Network

Junctions

Junction	Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Do Geometric Delay	Junction Delay (s)	Junction LOS
1	(untitled)	Roundabout	A,B,C,D				10.56	B

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description
A	A	A59 North	
B	B	A671	
C	C	A59 South	
D	D	Site Access	

Capacity Options

Arm	Minimum Capacity (PCU/hr)	Maximum Capacity (PCU/hr)	Assume Flat Start Profile	Initial Queue (PCU)
A	0.00	99999.00		0.00
B	0.00	99999.00		0.00
C	0.00	99999.00		0.00
D	0.00	99999.00		0.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
A	7.40	7.40	0.00	40.00	93.00	23.00	
B	3.90	7.30	37.00	57.00	93.00	7.00	
C	8.80	8.80	0.00	42.00	93.00	23.00	
D	4.70	8.60	30.00	35.00	93.00	29.00	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
A		(calculated)	(calculated)	0.556	2351.485
B		(calculated)	(calculated)	0.548	2198.431
C		(calculated)	(calculated)	0.619	2799.465
D		(calculated)	(calculated)	0.545	2313.806

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	ONE HOUR	✓	1742.00	100.000
B	ONE HOUR	✓	1196.00	100.000
C	ONE HOUR	✓	1115.00	100.000
D	ONE HOUR	✓	86.00	100.000

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction 1 (for whole period)

		To			
		A	B	C	D
From	A	3.000	804.000	904.000	31.000
	B	1008.000	0.000	155.000	33.000
	C	889.000	196.000	0.000	30.000
	D	36.000	25.000	25.000	0.000

Turning Proportions (PCU) - Junction 1 (for whole period)

		To			
		A	B	C	D
From	A	0.00	0.46	0.52	0.02
	B	0.84	0.00	0.13	0.03
	C	0.80	0.18	0.00	0.03
	D	0.42	0.29	0.29	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To			
From		A	B	C	D
	A	1.500	1.049	1.074	1.000
	B	1.068	1.000	1.041	1.000
	C	1.090	1.066	1.000	1.000
	D	1.000	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To			
From		A	B	C	D
	A	50.0	4.9	7.4	0.0
	B	6.8	0.0	4.1	0.0
	C	9.0	6.6	0.0	0.0
	D	0.0	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)	Total Queueing Delay (PCU-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (PCU-min/min)	Inclusive Total Queueing Delay (PCU-min)	Inclusive Average Queueing Delay (s)
A	0.87	13.30	6.82	B	1598.49	2397.73	307.42	7.69	3.42	307.45	7.69
B	0.81	12.59	4.47	B	1097.47	1646.21	209.35	7.63	2.33	209.37	7.63
C	0.59	4.65	1.57	A	1023.14	1534.72	92.03	3.60	1.02	92.04	3.60
D	0.09	3.75	0.10	A	78.92	118.37	6.23	3.16	0.07	6.23	3.16

Main Results for each time segment

Main results: (08:00-08:15)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1311.47	327.87	1305.59	1451.92	184.66	0.00	2248.83	1974.94	0.583	0.00	1.47	4.026	A
B	900.41	225.10	896.21	768.47	721.78	0.00	1803.09	1524.51	0.499	0.00	1.05	4.198	A
C	839.43	209.86	836.95	812.44	805.55	0.00	2300.55	1953.75	0.365	0.00	0.62	2.659	A
D	64.75	16.19	64.56	70.48	1572.02	0.00	1456.44	574.31	0.044	0.00	0.05	2.586	A

Main results: (08:15-08:30)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1566.02	391.51	1562.07	1737.21	220.91	0.00	2228.68	1974.95	0.703	1.47	2.46	5.698	A
B	1075.18	268.79	1072.47	919.41	863.57	0.00	1725.43	1524.51	0.623	1.05	1.73	5.833	A
C	1002.36	250.59	1001.24	972.07	963.97	0.00	2202.43	1953.75	0.455	0.62	0.90	3.243	A
D	77.31	19.33	77.24	84.33	1880.88	0.00	1287.99	574.31	0.060	0.05	0.06	2.972	A

Main results: (08:30-08:45)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1917.98	479.49	1901.77	2120.78	270.31	0.00	2201.22	1974.94	0.871	2.46	6.51	12.148	B
B	1316.82	329.21	1306.60	1120.56	1051.52	0.00	1622.48	1524.51	0.812	1.73	4.28	11.744	B
C	1227.64	306.91	1225.01	1183.73	1174.38	0.00	2072.11	1953.75	0.592	0.90	1.56	4.589	A
D	94.69	23.67	94.55	102.85	2296.54	0.00	1061.30	574.31	0.089	0.06	0.10	3.723	A

Main results: (08:45-09:00)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1917.98	479.49	1916.74	2130.90	270.84	0.00	2200.93	1974.94	0.871	6.51	6.82	13.295	B
B	1316.82	329.21	1316.09	1127.96	1059.62	0.00	1618.05	1524.51	0.814	4.28	4.47	12.592	B
C	1227.64	306.91	1227.57	1192.77	1182.94	0.00	2066.81	1953.75	0.594	1.56	1.57	4.645	A
D	94.69	23.67	94.68	103.45	2307.05	0.00	1055.56	574.31	0.090	0.10	0.10	3.745	A

Main results: (09:00-09:15)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1566.02	391.51	1583.04	1751.58	221.69	0.00	2228.25	1974.95	0.703	6.82	2.56	6.071	A
B	1075.18	268.79	1085.83	929.81	874.92	0.00	1719.21	1524.51	0.625	4.47	1.80	6.136	A
C	1002.36	250.59	1004.99	984.75	976.00	0.00	2194.98	1953.75	0.457	1.57	0.92	3.283	A
D	77.31	19.33	77.45	85.17	1895.82	0.00	1279.84	574.31	0.060	0.10	0.06	2.993	A

Main results: (09:15-09:30)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1311.47	327.87	1315.72	1460.95	185.45	0.00	2248.40	1974.94	0.583	2.56	1.50	4.116	A
B	900.41	225.10	903.34	773.86	727.30	0.00	1800.06	1524.51	0.500	1.80	1.07	4.280	A
C	839.43	209.86	840.59	818.70	811.95	0.00	2296.59	1953.75	0.366	0.92	0.63	2.679	A
D	64.75	16.19	64.82	70.96	1581.58	0.00	1451.23	574.31	0.045	0.06	0.05	2.596	A

Queueing Delay Results for each time segment
Queueing Delay results: (08:00-08:15)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	21.25	1.42	4.026	A	A
B	15.23	1.02	4.198	A	A
C	9.11	0.61	2.659	A	A
D	0.69	0.05	2.586	A	A

Queueing Delay results: (08:15-08:30)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	35.23	2.35	5.698	A	A
B	24.92	1.66	5.833	A	A
C	13.22	0.88	3.243	A	A
D	0.94	0.06	2.972	A	A

Queueing Delay results: (08:30-08:45)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	85.74	5.72	12.148	B	B
B	57.92	3.86	11.744	B	B
C	22.58	1.51	4.589	A	A
D	1.44	0.10	3.723	A	A

Queueing Delay results: (08:45-09:00)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	100.42	6.69	13.295	B	B
B	65.95	4.40	12.592	B	B
C	23.50	1.57	4.645	A	A
D	1.47	0.10	3.745	A	A

Queueing Delay results: (09:00-09:15)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	41.51	2.77	6.071	A	A
B	28.75	1.92	6.136	A	A
C	14.07	0.94	3.283	A	A
D	0.98	0.07	2.993	A	A

Queueing Delay results: (09:15-09:30)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	23.27	1.55	4.116	A	A
B	16.58	1.11	4.280	A	A
C	9.56	0.64	2.679	A	A
D	0.71	0.05	2.596	A	A

(Default Analysis Set) - Base 2024 + CD + Dev, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm B - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Analysis Set Details

Name	Roundabout Capacity Model	Description	Include In Report	Use Specific Demand Set(s)	Specific Demand Set (s)	Locked	Network Flow Scaling Factor (%)	Network Capacity Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	ARCADY		✓				100.000	100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Results For Central Hour Only	Single Time Segment Only	Locked	Run Automatically	Use Relationship	Relationship
Base 2024 + CD + Dev, FM	Base 2024 + CD + Dev	FM		ONE HOUR	16:30	18:00	90	15				✓		

Junction Network

Junctions

Junction	Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Do Geometric Delay	Junction Delay (s)	Junction LOS
1	(untitled)	Roundabout	A,B,C,D				11.04	B

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description
A	A	A59 North	
B	B	A671	
C	C	A59 South	
D	D	Site Access	

Capacity Options

Arm	Minimum Capacity (PCU/hr)	Maximum Capacity (PCU/hr)	Assume Flat Start Profile	Initial Queue (PCU)
A	0.00	99999.00		0.00
B	0.00	99999.00		0.00
C	0.00	99999.00		0.00
D	0.00	99999.00		0.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
A	7.40	7.40	0.00	40.00	93.00	23.00	
B	3.90	7.30	37.00	57.00	93.00	7.00	
C	8.80	8.80	0.00	42.00	93.00	23.00	
D	4.70	8.60	30.00	35.00	93.00	29.00	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
A		(calculated)	(calculated)	0.556	2351.485
B		(calculated)	(calculated)	0.548	2198.431
C		(calculated)	(calculated)	0.619	2799.465
D		(calculated)	(calculated)	0.545	2313.806

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	ONE HOUR	✓	1803.00	100.000
B	ONE HOUR	✓	1075.00	100.000
C	ONE HOUR	✓	1068.00	100.000
D	ONE HOUR	✓	135.00	100.000

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction 1 (for whole period)

		To			
		A	B	C	D
From	A	3.000	933.000	817.000	50.000
	B	881.000	0.000	159.000	35.000
	C	848.000	185.000	0.000	35.000
	D	48.000	46.000	41.000	0.000

Turning Proportions (PCU) - Junction 1 (for whole period)

		To			
		A	B	C	D
From	A	0.00	0.52	0.45	0.03
	B	0.82	0.00	0.15	0.03
	C	0.79	0.17	0.00	0.03
	D	0.36	0.34	0.30	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To			
From		A	B	C	D
	A	1.000	1.030	1.040	1.000
	B	1.018	1.000	1.006	1.000
	C	1.024	1.005	1.000	1.000
	D	1.000	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To			
From		A	B	C	D
	A	0.0	3.0	4.0	0.0
	B	1.8	0.0	0.6	0.0
	C	2.4	0.5	0.0	0.0
	D	0.0	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)	Total Queueing Delay (PCU-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (PCU-min/min)	Inclusive Total Queueing Delay (PCU-min)	Inclusive Average Queueing Delay (s)
A	0.91	17.80	9.31	C	1654.46	2481.70	379.76	9.18	4.22	379.79	9.18
B	0.72	7.83	2.53	A	986.44	1479.66	134.88	5.47	1.50	134.89	5.47
C	0.55	3.81	1.24	A	980.02	1470.02	75.08	3.06	0.83	75.09	3.06
D	0.13	3.55	0.15	A	123.88	185.82	9.39	3.03	0.10	9.39	3.03

Main Results for each time segment

Main results: (16:30-16:45)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1357.39	339.35	1351.09	1335.65	204.23	0.00	2237.96	1955.54	0.607	0.00	1.57	4.167	A
B	809.32	202.33	806.10	872.60	682.72	0.00	1824.48	1583.94	0.444	0.00	0.80	3.568	A
C	804.05	201.01	801.93	762.24	726.59	0.00	2349.45	1927.95	0.342	0.00	0.53	2.369	A
D	101.64	25.41	101.35	89.99	1438.53	0.00	1529.25	587.04	0.066	0.00	0.07	2.521	A

Main results: (16:45-17:00)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1620.86	405.22	1616.17	1598.02	244.30	0.00	2215.68	1955.53	0.732	1.57	2.75	6.157	A
B	966.40	241.60	964.67	1043.80	816.67	0.00	1751.11	1583.94	0.552	0.80	1.24	4.638	A
C	960.11	240.03	959.23	911.85	869.50	0.00	2260.94	1927.95	0.425	0.53	0.75	2.819	A
D	121.36	30.34	121.26	107.66	1721.06	0.00	1375.15	587.04	0.088	0.07	0.10	2.870	A

Main results: (17:00-17:15)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1985.14	496.29	1961.61	1954.11	299.02	0.00	2185.26	1955.53	0.908	2.75	8.63	15.253	C
B	1183.60	295.90	1178.64	1269.01	991.62	0.00	1655.29	1583.95	0.715	1.24	2.48	7.591	A
C	1175.89	293.97	1173.96	1108.28	1061.97	0.00	2141.73	1927.95	0.549	0.75	1.23	3.785	A
D	148.64	37.16	148.44	131.25	2104.69	0.00	1165.93	587.04	0.127	0.10	0.15	3.537	A

Main results: (17:15-17:30)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1985.14	496.29	1982.42	1959.60	299.47	0.00	2185.01	1955.53	0.909	8.63	9.31	17.803	C
B	1183.60	295.90	1183.37	1280.17	1001.71	0.00	1649.76	1583.95	0.717	2.48	2.53	7.830	A
C	1175.89	293.97	1175.86	1118.47	1066.61	0.00	2138.86	1927.95	0.550	1.23	1.24	3.811	A
D	148.64	37.16	148.64	132.04	2110.43	0.00	1162.80	587.04	0.128	0.15	0.15	3.548	A

Main results: (17:30-17:45)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1620.86	405.22	1646.54	1605.93	244.98	0.00	2215.30	1955.53	0.732	9.31	2.89	6.825	A
B	966.40	241.60	971.43	1060.10	831.42	0.00	1743.04	1583.94	0.554	2.53	1.28	4.768	A
C	960.11	240.03	962.03	926.70	876.15	0.00	2256.82	1927.95	0.425	1.24	0.76	2.841	A
D	121.36	30.34	121.56	108.82	1729.36	0.00	1370.63	587.04	0.089	0.15	0.10	2.884	A

Main results: (17:45-18:00)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
A	1357.39	339.35	1362.51	1342.35	205.00	0.00	2237.53	1955.54	0.607	2.89	1.61	4.276	A
B	809.32	202.33	811.16	879.16	688.35	0.00	1821.40	1583.94	0.444	1.28	0.82	3.627	A
C	804.05	201.01	804.95	768.27	731.23	0.00	2346.58	1927.95	0.343	0.76	0.53	2.382	A
D	101.64	25.41	101.74	90.57	1445.61	0.00	1525.39	587.04	0.067	0.10	0.07	2.530	A

Queueing Delay Results for each time segment
Queueing Delay results: (16:30-16:45)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	22.72	1.51	4.167	A	A
B	11.73	0.78	3.568	A	A
C	7.79	0.52	2.369	A	A
D	1.05	0.07	2.521	A	A

Queueing Delay results: (16:45-17:00)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	39.15	2.61	6.157	A	A
B	18.02	1.20	4.638	A	A
C	11.04	0.74	2.819	A	A
D	1.43	0.10	2.870	A	A

Queueing Delay results: (17:00-17:15)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	108.70	7.25	15.253	C	B
B	34.98	2.33	7.591	A	A
C	17.97	1.20	3.785	A	A
D	2.15	0.14	3.537	A	A

Queueing Delay results: (17:15-17:30)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	135.49	9.03	17.803	C	B
B	37.69	2.51	7.830	A	A
C	18.54	1.24	3.811	A	A
D	2.19	0.15	3.548	A	A

Queueing Delay results: (17:30-17:45)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	48.63	3.24	6.825	A	A
B	19.89	1.33	4.768	A	A
C	11.62	0.77	2.841	A	A
D	1.48	0.10	2.884	A	A

Queueing Delay results: (17:45-18:00)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
A	25.06	1.67	4.276	A	A
B	12.56	0.84	3.627	A	A
C	8.12	0.54	2.382	A	A
D	1.09	0.07	2.530	A	A

Appendix L – TRICS Report Sensitivity Test B1 Office

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 02 - EMPLOYMENT
 Category : A - OFFICE
 TOTAL VEHICLES

Selected regions and areas:

06	WEST MIDLANDS	
	WM WEST MIDLANDS	1 days
08	NORTH WEST	
	LC LANCASHIRE	1 days

Primary Filtering selection:

Parameter: Gross floor area
 Actual Range: 1800 to 2600 (units: sqm)
 Range Selected by User: 1000 to 4000 (units: sqm)

Parking Spaces Range: All Surveys Included

Public Transport Provision:

Selection by: Include all surveys

Date Range: 01/01/12 to 14/03/19

Selected survey days:

Tuesday 2 days

Selected survey types:

Manual count 2 days
 Directional ATC Count 0 days

Selected Locations:

Suburban Area (PPS6 Out of Centre) 2

Selected Location Sub Categories:

Residential Zone 1
 Built-Up Zone 1

Secondary Filtering selection:

Use Class:

B1 2 days

Filter by Use Class Breakdown:

All Surveys Included

Population within 500m Range:

All Surveys Included

Population within 1 mile:

5,001 to 10,000 1 days
 25,001 to 50,000 1 days

Population within 5 miles:

125,001 to 250,000 1 days
 500,001 or More 1 days

Car ownership within 5 miles:

0.6 to 1.0 1 days
 1.1 to 1.5 1 days

Travel Plan:

No 2 days

PTAL Rating:

No PTAL Present 2 days

LIST OF SITES relevant to selection parameters

1	LC-02-A-09 FURTHERGATE BLACKBURN	OFFICES		LANCASHIRE
	Suburban Area (PPS6 Out of Centre) Built-Up Zone			
	Total Gross floor area:		2600 sqm	
	<i>Survey date: TUESDAY</i>		<i>04/06/13</i>	<i>Survey Type: MANUAL</i>
2	WM-02-A-04 BOURNVILLE LANE BIRMINGHAM	OFFICE		WEST MIDLANDS
	Suburban Area (PPS6 Out of Centre) Residential Zone			
	Total Gross floor area:		1800 sqm	
	<i>Survey date: TUESDAY</i>		<i>10/11/15</i>	<i>Survey Type: MANUAL</i>

TRIP RATE for Land Use 02 - EMPLOYMENT/A - OFFICE

TOTAL VEHICLES

Calculation factor: 100 sqm

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	2	2200	0.455	2	2200	0.023	2	2200	0.478
08:00 - 09:00	2	2200	2.886	2	2200	0.205	2	2200	3.091
09:00 - 10:00	2	2200	1.409	2	2200	0.773	2	2200	2.182
10:00 - 11:00	2	2200	0.545	2	2200	0.477	2	2200	1.022
11:00 - 12:00	2	2200	0.545	2	2200	0.500	2	2200	1.045
12:00 - 13:00	2	2200	0.909	2	2200	1.114	2	2200	2.023
13:00 - 14:00	2	2200	0.955	2	2200	0.909	2	2200	1.864
14:00 - 15:00	2	2200	0.614	2	2200	0.614	2	2200	1.228
15:00 - 16:00	2	2200	0.432	2	2200	0.750	2	2200	1.182
16:00 - 17:00	2	2200	0.591	2	2200	1.523	2	2200	2.114
17:00 - 18:00	2	2200	0.273	2	2200	2.182	2	2200	2.455
18:00 - 19:00	2	2200	0.023	2	2200	0.500	2	2200	0.523
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			9.637			9.570			19.207

Parameter summary

Trip rate parameter range selected: 1800 - 2600 (units: sqm)
 Survey date date range: 01/01/12 - 14/03/19
 Number of weekdays (Monday-Friday): 2
 Number of Saturdays: 0
 Number of Sundays: 0
 Surveys automatically removed from selection: 0
 Surveys manually removed from selection: 0

Appendix M – Modelling Output Clitheroe Road Access

<h1>Junctions 8</h1>
<h2>PICADY 8 - Priority Intersection Module</h2>
Version: 8.0.6.541 [19821.26/11/2015] © Copyright TRL Limited, 2020
For sales and distribution information, program advice and maintenance, contact TRL: Tel: +44 (0)1344 770758 email: software@trl.co.uk Web: http://www.trlsoftware.co.uk
The users of this computer program for the solution of an engineering problem are in no way relieved of their responsibility for the correctness of the solution

Filename: Site Access_Clitheroe Road 07-04-2020.arc8
Path: N:\Vectos Job Data\2019\VN91274 Whalley, Clitheroe\Picady
Report generation date: 07/04/2020 16:08:17

Summary of junction performance

	AM		PM	
	Queue (PCU)	RFC	Queue (PCU)	RFC
A1 - Base 2024 + Committed + Development				
Stream B-AC	0.06	0.06	0.04	0.03
Stream C-AB	0.03	0.02	0.04	0.03
Stream C-A	-	-	-	-
Stream A-B	-	-	-	-
Stream A-C	-	-	-	-

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

"D1 - Base 2024 + Committed + Development, AM" model duration: 08:00 - 09:30
"D2 - Base 2024 + Committed + Development, PM" model duration: 16:30 - 18:00

Run using Junctions 8.0.6.541 at 07/04/2020 16:08:17

File summary

Title	(untitled)
Location	
Site Number	
Date	16/04/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	Office
Description	

Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	RFC Threshold	Average Delay Threshold (s)	Queue Threshold (PCU)
5.75			N/A	0.85	36.00	20.00

Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
m	kph	PCU	PCU	perHour	s	-Min	perMin

(Default Analysis Set) - Base 2024 + Committed + Development, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Include In Report	Use Specific Demand Set(s)	Specific Demand Set(s)	Locked	Network Flow Scaling Factor (%)	Network Capacity Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	N/A		✓				100.000	100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Results For Central Hour Only	Single Time Segment Only	Locked	Run Automatically	Use Relationship	Relationship
Base 2024 + Committed + Development, AM	Base 2024 + Committed + Development	AM		ONE HOUR	08:00	09:30	90	15				✓		

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Do Geometric Delay	Junction Delay (s)	Junction LOS
1	(untitled)	T-Junction	Two-way	A,B,C		6.97	A

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description	Arm Type
A	A	Clitheroe Road North		Major
B	B	Site Access		Minor
C	C	Clitheroe Road South		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
C	8.50		0.00		2.20	150.00	✓	0.00

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

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	One lane	2.40										60	60

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	495.182	0.080	0.203	0.128	0.290
1	B-C	621.960	0.085	0.215	-	-
1	C-B	660.830	0.228	0.228	-	-

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

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

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

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	ONE HOUR	✓	336.00	100.000
B	ONE HOUR	✓	24.00	100.000
C	ONE HOUR	✓	339.00	100.000

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction 1 (for whole period)

	From	To		
		A	B	C
	A	0.000	5.000	331.000
	B	9.000	0.000	15.000
	C	330.000	9.000	0.000

Turning Proportions (PCU) - Junction 1 (for whole period)

	From	To		
		A	B	C
	A	0.00	0.01	0.99
	B	0.38	0.00	0.63
	C	0.97	0.03	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

	From	To		
		A	B	C
	A	1.000	1.000	1.066
	B	1.000	1.000	1.000
	C	1.036	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

	From	To		
		A	B	C
	A	0.0	0.0	6.6
	B	0.0	0.0	0.0
	C	3.6	0.0	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)	Total Queueing Delay (PCU-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (PCU-min/min)	Inclusive Total Queueing Delay (PCU-min)	Inclusive Average Queueing Delay (s)
B-AC	0.06	8.25	0.06	A	22.02	33.03	4.31	7.84	0.05	4.31	7.84
C-AB	0.02	4.82	0.03	A	13.08	19.62	1.76	5.39	0.02	1.76	5.39
C-A	-	-	-	-	298.00	446.99	-	-	-	-	-
A-B	-	-	-	-	4.59	6.88	-	-	-	-	-
A-C	-	-	-	-	303.73	455.60	-	-	-	-	-

Main Results for each time segment

Main results: (08:00-08:15)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-AC	18.07	4.52	17.92	0.00	496.63	0.036	0.00	0.04	7.518	A
C-AB	9.79	2.45	9.73	0.00	765.59	0.013	0.00	0.01	4.814	A
C-A	245.43	61.36	245.43	0.00	-	-	-	-	-	-
A-B	3.76	0.94	3.76	0.00	-	-	-	-	-	-
A-C	249.19	62.30	249.19	0.00	-	-	-	-	-	-

Main results: (08:15-08:30)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-AC	21.58	5.39	21.54	0.00	482.55	0.045	0.04	0.05	7.809	A
C-AB	12.54	3.14	12.53	0.00	786.49	0.016	0.01	0.02	4.705	A
C-A	292.21	73.05	292.21	0.00	-	-	-	-	-	-
A-B	4.49	1.12	4.49	0.00	-	-	-	-	-	-
A-C	297.56	74.39	297.56	0.00	-	-	-	-	-	-

Main results: (08:30-08:45)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-AC	26.42	6.61	26.37	0.00	462.89	0.057	0.05	0.06	8.246	A
C-AB	16.88	4.22	16.85	0.00	815.32	0.021	0.02	0.03	4.569	A
C-A	356.37	89.09	356.37	0.00	-	-	-	-	-	-
A-B	5.51	1.38	5.51	0.00	-	-	-	-	-	-
A-C	364.44	91.11	364.44	0.00	-	-	-	-	-	-

Main results: (08:45-09:00)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-AC	26.42	6.61	26.42	0.00	462.89	0.057	0.06	0.06	8.247	A
C-AB	16.89	4.22	16.89	0.00	815.32	0.021	0.03	0.03	4.576	A
C-A	356.36	89.09	356.36	0.00	-	-	-	-	-	-
A-B	5.51	1.38	5.51	0.00	-	-	-	-	-	-
A-C	364.44	91.11	364.44	0.00	-	-	-	-	-	-

Main results: (09:00-09:15)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-AC	21.58	5.39	21.63	0.00	482.55	0.045	0.06	0.05	7.811	A
C-AB	12.55	3.14	12.58	0.00	786.50	0.016	0.03	0.02	4.717	A
C-A	292.20	73.05	292.20	0.00	-	-	-	-	-	-
A-B	4.49	1.12	4.49	0.00	-	-	-	-	-	-
A-C	297.56	74.39	297.56	0.00	-	-	-	-	-	-

Main results: (09:15-09:30)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-AC	18.07	4.52	18.11	0.00	496.62	0.036	0.05	0.04	7.522	A
C-AB	9.81	2.45	9.83	0.00	765.60	0.013	0.02	0.01	4.821	A
C-A	245.41	61.35	245.41	0.00	-	-	-	-	-	-
A-B	3.76	0.94	3.76	0.00	-	-	-	-	-	-
A-C	249.19	62.30	249.19	0.00	-	-	-	-	-	-

Queueing Delay Results for each time segment**Queueing Delay results: (08:00-08:15)**

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-AC	0.54	0.04	7.518	A	A
C-AB	0.22	0.01	4.814	A	A
C-A	-	-	-	-	-
A-B	-	-	-	-	-
A-C	-	-	-	-	-

Queueing Delay results: (08:15-08:30)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-AC	0.68	0.05	7.809	A	A
C-AB	0.28	0.02	4.705	A	A
C-A	-	-	-	-	-
A-B	-	-	-	-	-
A-C	-	-	-	-	-

Queueing Delay results: (08:30-08:45)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-AC	0.88	0.06	8.246	A	A
C-AB	0.38	0.03	4.569	A	A
C-A	-	-	-	-	-
A-B	-	-	-	-	-
A-C	-	-	-	-	-

Queueing Delay results: (08:45-09:00)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-AC	0.90	0.06	8.247	A	A
C-AB	0.38	0.03	4.576	A	A
C-A	-	-	-	-	-
A-B	-	-	-	-	-
A-C	-	-	-	-	-

Queueing Delay results: (09:00-09:15)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-AC	0.72	0.05	7.811	A	A
C-AB	0.28	0.02	4.717	A	A
C-A	-	-	-	-	-
A-B	-	-	-	-	-
A-C	-	-	-	-	-

Queueing Delay results: (09:15-09:30)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-AC	0.58	0.04	7.522	A	A
C-AB	0.22	0.01	4.821	A	A
C-A	-	-	-	-	-
A-B	-	-	-	-	-
A-C	-	-	-	-	-

(Default Analysis Set) - Base 2024 + Committed + Development, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Include In Report	Use Specific Demand Set(s)	Specific Demand Set(s)	Locked	Network Flow Scaling Factor (%)	Network Capacity Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	N/A		✓				100.000	100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Results For Central Hour Only	Single Time Segment Only	Locked	Run Automatically	Use Relationship	Relationship
Base 2024 + Committed + Development, PM	Base 2024 + Committed + Development	PM		ONE HOUR	16:30	18:00	90	15				✓		

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Do Geometric Delay	Junction Delay (s)	Junction LOS
1	(untitled)	T-Junction	Two-way	A,B,C		6.11	A

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description	Arm Type
A	A	Clitheroe Road North		Major
B	B	Site Access		Minor

C	C	Clitheroe Road South	Major
---	---	----------------------	-------

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
C	8.50		0.00		2.20	150.00	✓	0.00

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

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	One lane	2.40										60	60

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	495.182	0.080	0.203	0.128	0.290
1	B-C	621.960	0.085	0.215	-	-
1	C-B	660.830	0.228	0.228	-	-

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

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

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

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	ONE HOUR	✓	322.00	100.000
B	ONE HOUR	✓	15.00	100.000
C	ONE HOUR	✓	338.00	100.000

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.000	7.000	315.000
	B	5.000	0.000	10.000
	C	325.000	13.000	0.000

Turning Proportions (PCU) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.00	0.02	0.98
	B	0.33	0.00	0.67
	C	0.96	0.04	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.030
	B	1.000	1.000	1.000
	C	1.019	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	3.0
	B	0.0	0.0	0.0
	C	1.9	0.0	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)	Total Queueing Delay (PCU-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (PCU-min/min)	Inclusive Total Queueing Delay (PCU-min)	Inclusive Average Queueing Delay (s)
B-AC	0.03	7.87	0.04	A	13.76	20.65	2.59	7.53	0.03	2.59	7.53
C-AB	0.03	4.82	0.04	A	18.74	28.11	2.68	5.71	0.03	2.68	5.71
C-A	-	-	-	-	291.41	437.12	-	-	-	-	-
A-B	-	-	-	-	6.42	9.64	-	-	-	-	-
A-C	-	-	-	-	289.05	433.57	-	-	-	-	-

Main Results for each time segment

Main results: (16:30-16:45)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-AC	11.29	2.82	11.20	0.00	505.93	0.022	0.00	0.02	7.277	A
C-AB	14.05	3.51	13.96	0.00	765.28	0.018	0.00	0.02	4.818	A
C-A	240.41	60.10	240.41	0.00	-	-	-	-	-	-
A-B	5.27	1.32	5.27	0.00	-	-	-	-	-	-
A-C	237.15	59.29	237.15	0.00	-	-	-	-	-	-

Main results: (16:45-17:00)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-AC	13.48	3.37	13.46	0.00	492.58	0.027	0.02	0.03	7.513	A
C-AB	17.98	4.50	17.96	0.00	786.08	0.023	0.02	0.03	4.715	A
C-A	285.87	71.47	285.87	0.00	-	-	-	-	-	-
A-B	6.29	1.57	6.29	0.00	-	-	-	-	-	-
A-C	283.18	70.79	283.18	0.00	-	-	-	-	-	-

Main results: (17:00-17:15)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-AC	16.52	4.13	16.48	0.00	473.93	0.035	0.03	0.04	7.870	A
C-AB	24.16	6.04	24.11	0.00	814.76	0.030	0.03	0.04	4.585	A
C-A	347.99	87.00	347.99	0.00	-	-	-	-	-	-
A-B	7.71	1.93	7.71	0.00	-	-	-	-	-	-
A-C	346.82	86.71	346.82	0.00	-	-	-	-	-	-

Main results: (17:15-17:30)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-AC	16.52	4.13	16.51	0.00	473.93	0.035	0.04	0.04	7.870	A
C-AB	24.17	6.04	24.17	0.00	814.77	0.030	0.04	0.04	4.590	A
C-A	347.98	86.99	347.98	0.00	-	-	-	-	-	-
A-B	7.71	1.93	7.71	0.00	-	-	-	-	-	-
A-C	346.82	86.71	346.82	0.00	-	-	-	-	-	-

Main results: (17:30-17:45)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-AC	13.48	3.37	13.51	0.00	492.57	0.027	0.04	0.03	7.514	A

C-AB	18.00	4.50	18.04	0.00	786.11	0.023	0.04	0.03	4.722	A
C-A	285.85	71.46	285.85	0.00	-	-	-	-	-	-
A-B	6.29	1.57	6.29	0.00	-	-	-	-	-	-
A-C	283.18	70.79	283.18	0.00	-	-	-	-	-	-

Main results: (17:45-18:00)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-AC	11.29	2.82	11.31	0.00	505.92	0.022	0.03	0.02	7.280	A
C-AB	14.08	3.52	14.11	0.00	765.31	0.018	0.03	0.02	4.822	A
C-A	240.38	60.10	240.38	0.00	-	-	-	-	-	-
A-B	5.27	1.32	5.27	0.00	-	-	-	-	-	-
A-C	237.15	59.29	237.15	0.00	-	-	-	-	-	-

Queueing Delay Results for each time segment

Queueing Delay results: (16:30-16:45)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-AC	0.33	0.02	7.277	A	A
C-AB	0.32	0.02	4.818	A	A
C-A	-	-	-	-	-
A-B	-	-	-	-	-
A-C	-	-	-	-	-

Queueing Delay results: (16:45-17:00)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-AC	0.41	0.03	7.513	A	A
C-AB	0.42	0.03	4.715	A	A
C-A	-	-	-	-	-
A-B	-	-	-	-	-
A-C	-	-	-	-	-

Queueing Delay results: (17:00-17:15)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-AC	0.53	0.04	7.870	A	A
C-AB	0.58	0.04	4.585	A	A
C-A	-	-	-	-	-
A-B	-	-	-	-	-
A-C	-	-	-	-	-

Queueing Delay results: (17:15-17:30)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-AC	0.54	0.04	7.870	A	A
C-AB	0.59	0.04	4.590	A	A
C-A	-	-	-	-	-
A-B	-	-	-	-	-
A-C	-	-	-	-	-

Queueing Delay results: (17:30-17:45)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-AC	0.43	0.03	7.514	A	A
C-AB	0.43	0.03	4.722	A	A
C-A	-	-	-	-	-
A-B	-	-	-	-	-
A-C	-	-	-	-	-

Queueing Delay results: (17:45-18:00)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-AC	0.35	0.02	7.280	A	A
C-AB	0.33	0.02	4.822	A	A
C-A	-	-	-	-	-
A-B	-	-	-	-	-
A-C	-	-	-	-	-