

Technical Note

Project: Harlow/Epping Forest District

Subject: Access Strategy Traffic Modelling Report

Client:	Epping Forest District Council	Version:	C
Project No:	04777	Author:	EK
Date:	07/07/2020	Approved:	JT

I Impact Assessment Methodology

I.1 Introduction

- 1.1.1 This Technical Note has been prepared to provide an overview of the traffic modelling methodology applied within the assessment of access strategy options for the Latton Priory site in Epping Forest District.
- 1.1.2 The brief for the access strategy assessment required a proportionate level of traffic modelling to be undertaken which is appropriate for the current stage of plan making.
- 1.1.3 The PJA proposal outlined the proposed methodology to respond to the brief, based upon the project timescales and information available. The methodology proposed in order to respond to the requirements of the brief comprised a link-based assessment using available data, assessing the comparative impacts of the various access options on link capacity using the criteria set out in TA 79/99. The purpose was to provide a comparative analysis to assist with the consideration of the merits of each of the access options for the site.
- 1.1.4 The study area as identified within the brief comprised the following links:
- Commonside (Trotters Road)
 - Parrington Road
 - Latton Common Road
 - A1169 Southern Way – including the junctions with the above roads
 - A1169 Southern Way/A414 Junction
 - A414/M11 Junction 7 and the approaches to the junctions
 - B1393 Epping Road

- Rye Hill Road

1.1.5 The impact assessment was undertaken for the five sifted access scenarios as summarised below:

- Option 1: Western access only
- Option 2: Western and northern accesses
- Option 3: Western and eastern accesses
- Option 4: Western, eastern and northern accesses
- Option 5: Eastern access only

1.2 Base Data

1.2.1 To inform the impact assessment, traffic data was obtained for the assessment network from a range of existing sources. Essex County Council (ECC) provided Automatic Traffic Count (ATC) data for 20 sites covering the study area for the five-year period from 2015 to 2019.

1.2.2 To supplement the ECC data, link flows for Tysea Road and Trotters Road have been established from the Transport Assessment prepared for the planning application for The Briars, Aylets Field and Copshall Close (application ref: HW/FUL/15/00229). These flows were captured in May 2015.

1.2.3 Data for the slip roads of M11 Junction 7 was extracted from WebTris. Average peak hour flows were calculated based upon data from September 2019 as a neutral month.

1.2.4 In order to proceed with the assessment a common base year was needed across the study area, and traffic flows were factored to 2019 using growth factors obtained from TEMPRO for the mid-layer super output areas immediately surrounding the Latton Priory site.

1.3 Link Capacities

1.3.1 An assessment of link capacities on the local road network within the study area was undertaken based upon guidance contained within TA 79/99. The assessment takes account of various criteria including carriageway width, the number of traffic lanes speed limit, side road frequency, crossing provision and bus stop arrangements. A summary of the link capacities adopted for the assessment for key links on the local network is provided in

Table 1-1: Summary of Local Network Link Capacities

Link Name	TA 79/99 Classification	Capacity (veh/hr)	2019 Base Flow Link Capacities	
			AM Peak	PM Peak
Paringdon Road	UAP3	1110	18-37%	16-41%
Rye Hill Road (north of access)	UAP3	1110	24%	22%
Rye Hill Road (southern section)	UAP4 (capacity halved due to width)	375	72%	64%
London Road	UAP2	1260	49-69%	71-72%
Southern Way	UAP2	1470	76%	71%
Commonside Road	UAP3	900	23%	33%

Note: Link flow capacities calculated on busiest direction flow as per TA 79/99.

1.4 Trip Generation

- 1.4.1 The Invitation to Tender document included at Appendix Section 7 a report prepared by Jacobs setting out the outcomes of an initial review of transport impacts and an access option scoring exercise. The document includes AM peak hour trip rates for the residential, employment and secondary school uses proposed. The remaining land uses were assumed to be ancillary to the site and unlikely to result in external trip generation.
- 1.4.2 The Jacobs trip rates were reviewed by PJA, and compared against trip rates derived from a multi-modal TRICS assessment. In order to consider both the AM and PM peak hours within the assessment, additional data was needed as the Jacobs report only presented trip rates for the AM peak hour. It was therefore decided to proceed with using the TRICS vehicular trip rates for the assessment so that the same dataset was used for both peak hours. The TRICS trip rates are summarised at Table 1-2.

Table 1-2: TRICS Trip Rates

	Residential (/dwelling)			B1 Office (/100sqm)			Secondary School (/pupil)		
	Arr	Dep	Tot	Arr	Dep	Tot	Arr	Dep	Tot
AM Peak (08:00-09:00)	0.146	0.349	0.495	1.225	0.157	1.382	0.150	0.135	0.285
PM Peak (17:00-18:00)	0.328	0.164	0.492	0.069	0.686	0.755	0.026	0.019	0.045

- 1.4.3 For the purposes of establishing the external trip generation for the site, the development quantum of 1,050 dwellings and 10,000sqm employment floorspace were used. For the proposed secondary school, it is expected that a proportion of pupils would be drawn from within the site itself. Data from the 2011 Census has been interrogated for the adjoining

residential areas of Harlow to determine the likely number. This analysis suggests that 260 pupils would be drawn from within the site, assuming the same demographic as the adjoining areas. The secondary school trip generation adopted for the assessment has therefore been calculated upon 1,000 pupils.

Table 1-3: Forecast Base Trip Generation

	Residential (1,050 dwellings)			B1 Office (10,000 sqm)			Secondary School (1,000 pupils)			Total		
	Arr	Dep	Tot	Arr	Dep	Tot	Arr	Dep	Tot	Arr	Dep	Tot
AM Peak (08:00-09:00)	153	366	520	123	16	138	150	135	285	426	517	943
PM Peak (17:00-18:00)	344	172	517	7	69	76	26	19	45	377	260	637

1.4.4 In order to reflect the aspirational mode split of trips from the Latton Priory site, the multi-modal TRICS data has been interrogated, and an adjustment applied to the total two-way vehicle trips in each of the peak hours. This reflects the methodology applied within the Jacobs assessment work. Within the base TRICS data, the mode split in the AM peak is forecast to be 38% by vehicle and 62% by sustainable modes. In the PM peak 62% of trips are forecast by vehicle and 38% by sustainable modes. An adjustment was therefore applied to the two-way PM peak hour trip generation to reduce the vehicle trip generation by 35%, with a corresponding increase in trips by sustainable modes. Due to the split of trips evident in the base data for the AM peak, no adjustment was required for this time period. The resultant trip generation used for the purposes of the assessment is summarised in Table 1-4.

Table 1-4: Forecast Trip Generation - 40% Vehicle Trips, 60% Sustainable Modes

	Residential (1,050 dwellings)			B1 Office (10,000 sqm)			Secondary School (1,000 pupils)			Total		
	Arr	Dep	Tot	Arr	Dep	Tot	Arr	Dep	Tot	Arr	Dep	Tot
AM Peak (08:00-09:00)	153	366	520	123	16	138	150	135	285	426	517	943
PM Peak (17:00-18:00)	223	112	335	4	44	49	17	12	29	244	168	413

1.5 Trip Distribution

1.5.1 Vehicle trips to and from the site have been distributed based upon Census 2011 data for the adjacent Harlow 010 middle layer super output area. Separate distributions were established

for each of the residential and employment land uses, and for each access location; West, North and East, reflecting travel preferences on the local network from the different sides of the site.

Residential Trips

- 1.5.2 To establish the residential trip generation, dataset WU03EW was used, with Harlow 010 set as the resident location and employment destinations geographically unconstrained. This was applied to the AM peak departures and PM peak arrivals. The distribution of the AM peak arrivals and PM peak departures was based upon the directional split of traffic on links determined from the base data.

Employment Trips

- 1.5.3 Employment trip distribution was based upon dataset WU03EW, setting Harlow 010 as the workplace location, with resident locations geographically unconstrained. AM peak departures and PM peak arrivals associated with the employment use were distributed according to the directional split of traffic on links determined from the base data.

School Trips

- 1.5.4 Due to uncertainty over the likely pupil locations at the time of undertaking the assessment, the employment distribution was used for the purposes of distributing the external secondary school trips.

Distribution Summary

- 1.5.5 Table 1-5 provides a summary of the broad directional distribution of trips to and from the site derived from the respective detailed assessments. Within the assessment of each of the access scenarios there are variations in the arrival/departure directions, reflective of local peak hour traffic conditions, and the location of the individual accesses.

Table 1-5: Summary of Latton Priory Trip Distribution

Direction	Residential Distribution	Employment/School Distribution
North	32%	33%
North East	6%	20%
East	3%	6%
South East	2%	3%
South	20%	13%
South West	8%	3%
West	4%	2%
North West	24%	20%
Total	100%	100%

1.6 Trip Assignment

1.6.1 The assessment was based upon the residual vehicle trips following application of the mode split adjustment as set out at paragraph 1.4.4. Trips were assigned to the network within the study area according to the most preferable routes during typical highway peak traffic conditions.

1.7 Modelling Scenarios

1.7.1 The capacity assessment was undertaken for the five sifted access options as summarised below:

- Option 1: Western access only
- Option 2: Western and northern accesses
- Option 3: Western and eastern accesses
- Option 4: Western, eastern and northern accesses
- Option 5: Eastern access only

1.7.2 Under options 2, 3 and 4 traffic was assumed to be split equally between access locations and it was assumed that there would be a connected vehicle link within the site.

1.7.3 Copies of the spreadsheet model setting out the traffic flows across the access options is included at Appendix A.

1.8 Limitations

1.8.1 The following limitations should be noted in respect of the assessment undertaken which was intended as a comparative tool to aide in assessing the merits of respective access options.

- No re-distribution of base traffic through the site has been assessed.

- No allowance has been made for future traffic growth or traffic associated with committed development, or other draft allocations.

2 Assessment Results

2.1.1 This section provides headline results for the capacity assessment undertaken of each of the shortlisted options.

2.1.2 The vehicular trip generation is highest in the AM peak hour, and therefore the analysis has focussed upon this period where highway capacity would be most impacted by the proposals.

2.2 Option 1: Western Access

- Rye Hill Road north of access: 117% and 121% increase in traffic southbound and northbound respectively.
- Rye Hill Road south of access: 98% and 74% increase in traffic southbound and northbound respectively.
- Parrington Road: circa 55% increase in eastbound traffic and 75% increase in westbound traffic.
- Increase of 22% traffic approaching M11 Junction 7 on London Road and 28% increase in southbound traffic between Junction 7 and Rye Hill Road.
- 8% increase in traffic both north and south bound on London Road to the south of Rye Hill Road.
- Rye Hill Road south forecast to operate over link capacity (125%), London Road forecast to operate at between 60-78% of link capacity north of Rye Hill Road, and 73% to the south.
- Southern Way forecast to operate at 83% of link capacity.

2.3 Option 2: Western and Northern Accesses

- Traffic increases of circa 50% north and south bound on Tysea Road.
- Commonsie Road westbound forecast 18% increase in traffic.
- Rye Hill Road north of access forecast 45% increase in traffic both north and south bound.
- Rye Hill Road south of access: 82% and 62% increase in traffic southbound and northbound respectively.
- Increase of 20% traffic approaching M11 Junction 7 on London Road and 20% increase in southbound traffic between Junction 7 and Rye Hill Road.

- 10% and 5% increase in traffic northbound and southbound respectively on London Road to the south of Rye Hill Road.
- Rye Hill Road south forecast to operate over link capacity (116%), London Road forecast to operate between 59-76% link capacity to the north, and 73% of link capacity to the south of Rye Hill Road.
- Southern Way forecast to operate at 78% of link capacity.

2.4 **Option 3: Western and Eastern Accesses**

- Rye Hill Road north of access: 80% and 72% increase in traffic southbound and northbound respectively.
- Rye Hill Road south of access: 9% and 10% increase in traffic southbound and northbound respectively.
- Parrington Road: circa 20% increase in eastbound traffic and 30% increase in westbound traffic.
- Increase of 38% traffic approaching M11 Junction 7 on London Road and 33% increase in southbound traffic between Junction 7 and eastern access.
- 16% increase in traffic northbound and 12% southbound on London Road to the south of Rye Hill Road.
- Rye Hill Road south forecast to operate within link capacity (79%), London Road forecast to operate between 67-72% of link capacity north of Rye Hill Road, and 77% to the south.
- Southern Way forecast to operate at 76% of link capacity.

2.5 **Option 4: Western, Eastern and Northern Accesses**

- Rye Hill Road north of access: 43% and 54% increase in traffic southbound and northbound respectively.
- Rye Hill Road south of access: 8% increase in traffic both north and southbound.
- Parrington Road: circa 4% increase in traffic east and westbound to the east of Rye Hill Road. Between 23% and 30% increase in traffic on Parrington Road to the west of Parsloe Road.
- Increase of 25% traffic approaching M11 Junction 7 on London Road and 28% increase in southbound traffic between Junction 7 and eastern access.
- Circa 12% increase in traffic both north and south bound on London Road to the south of Rye Hill Road.
- Rye Hill Road south forecast to operate within link capacity (77%), London Road forecast to operate between 61-71% of link capacity north of Rye Hill Road, and 76% to the south.

- Southern Way forecast to operate at 677% of link capacity.

2.6 Option 5: Eastern Access

- Rye Hill Road north of access: 32% and 14% increase in traffic southbound and northbound respectively.
- Rye Hill Road south of access: 32% and 14% increase in traffic southbound and northbound respectively.
- Parrington Road: circa 3% increase in eastbound traffic and 15% increase in westbound traffic.
- Increase of 66% traffic approaching M11 Junction 7 on London Road and 55% increase in southbound traffic between Junction 7 and eastern access.
- Circa 11% increase in traffic both north and south bound on London Road to the south of Rye Hill Road.
- Rye Hill Road south forecast to operate close to link capacity (82%), London Road forecast to operate between 77-81% of link capacity north of Rye Hill Road, and 76% to the south.
- Southern Way forecast to operate at 79% of link capacity.

2.7 Summary

2.7.1 Table 2-1 provides a comparison of the traffic flows and capacities on key links immediately surrounding Latton Priory for the five tested scenarios and for the 2019 base scenario for comparison purposes. The results are summarised for the AM peak hour when the development impact is greatest in terms of numbers of additional vehicle trips.

Table 2-1: Summary of Traffic Flows and Link Capacity Assessment Results – AM Peak Hour

Link Name	Link Capacity (veh/hr)	2019 Base		Option 1		Option 2		Option 3		Option 4		Option 5	
		Flow	% Link Capacity	Flow	% Link Capacity	Flow	% Link Capacity	Flow	% Link Capacity	Flow	% Link Capacity	Flow	% Link Capacity
Paringdon Road East	1110	200	18%	356	32%	232	21%	250	23%	208	19%	219	20%
Paringdon Road West	1110	413	37%	552	50%	538	48%	548	49%	553	50%	440	40%
Rye Hill Road (north of access)	1110	270	24%	595	54%	399	36%	464	42%	415	37%	307	28%
Rye Hill Road (southern section)	375	270	72%	468	125%	436	116%	295	79%	290	77%	307	82%
London Road North	1260	616	49%	762	60%	738	59%	850	67%	769	61%	1023	81%
London Road South	1260	703	69%	987	78%	741	73%	790	77%	777	76%	775	76%
Southern Way	1470	1118	76%	1215	83%	1146	78%	1124	76%	1125	77%	1154	79%
Commonside Road	900	207	23%	212	24%	244	27%	212	24%	222	25%	212	24%

Note: Link flows = busiest direction flow in each scenario.

3 Assessment of Potential Mitigation

3.1.1 The overall study assessing access options for the Latton Priory site identifies Option 3 as the preferred access arrangement. A series of highway mitigation options have been presented in connection with this preferred access strategy. The closure of Rye Hill Road to through traffic forms a key mitigation measure. Alongside this, a series of wider, complementary mitigation measures have been considered.

3.1.2 In the context of the traffic modelling undertaken as part of this assessment, it has not been possible to assess the potential impacts of the wider complimentary measures due to the likely level of background traffic redistribution that would occur. If these measures are taken forward in connection with the development of the site, assessment of the impacts would be necessary within the subsequent Transport Assessment. However, the impacts on the local network resulting from the closure of Rye Hill Road to through traffic have been considered.

3.1.3 All of the traffic on Rye Hill Road has been re-assigned through the site and distributed from the eastern access junction on London Road according to the directional split of base traffic. The effect of removing traffic from Rye Hill Road is to increase traffic on London Road between the Rye Hill Road junction and proposed eastern access. Table 3-1 summarises the impacts for this scenario for the affected links, alongside the corresponding impacts for the Option 3 scenario without mitigation.

Table 3-1: Summary of Link Flows and Capacity Assessment Results for Mitigation Option - AM Peak Hour

Link Name	Link Capacity (veh/hr)	Option 3		Option 3 + Rye Hill Rd Closure	
		Flow	% Link Capacity	Flow	% Link Capacity
Rye Hill Road access	1110	213	19%	677	61%
Eastern access road	1260	303	24%	708	56%
London Road between Rye Hill Road and Eastern access junction	1260	911	72%	1108	88%

Note: Access road link capacities assumed, subject to further detailed design

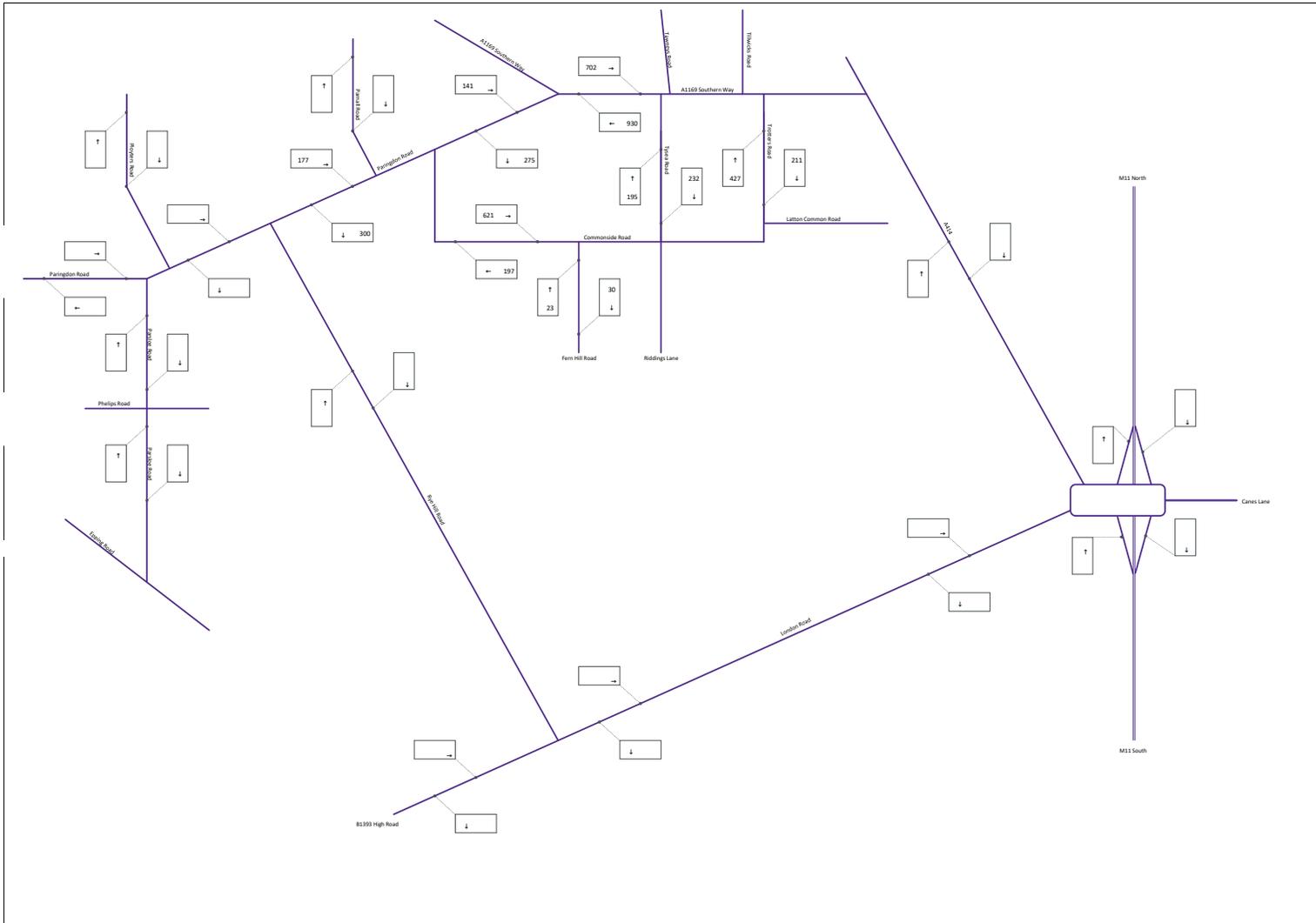
3.1.4 Table 3-1 demonstrates that the closure of Rye Hill Road to through traffic would significantly increase traffic using the site access roads as a result of using Latton Priory as an alternative route. There would also be a localised increase in trips on London Road between the eastern access and Rye Hill Road, largely as a result of the redistribution of base traffic. This analysis underlines the importance of the design and treatments applied to the main link road through Latton Priory

in order to ensure that it does not provide a more direct and attractive route that could induce further demand.

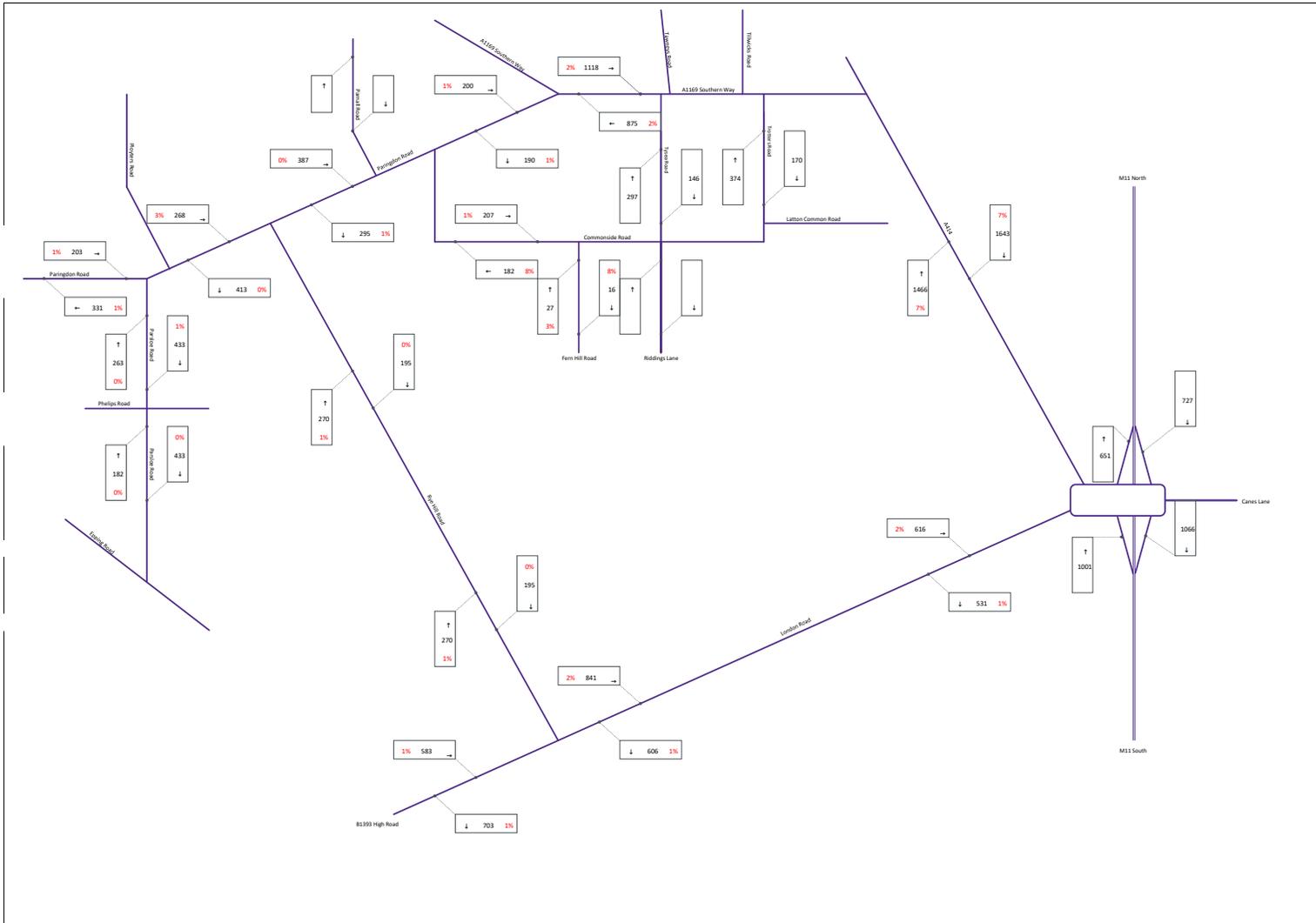
4 Summary

- 4.1.1 This Technical Note has been prepared by PJA to outline the traffic modelling methodology applied in assessing the relative impacts of the access options to the Latton Priory site in Epping Forest District.
- 4.1.2 The assessment has been based upon available data, is necessarily high level in its scope and forms one element feeding into a broader assessment of the relative merits of the various options available to access the site.
- 4.1.3 A summary of the development impacts on key links in the vicinity of the site has been presented for each of the shortlisted access options assessed, with more detailed information provided within the spreadsheet model diagrams included at Appendix A of this Technical Note.

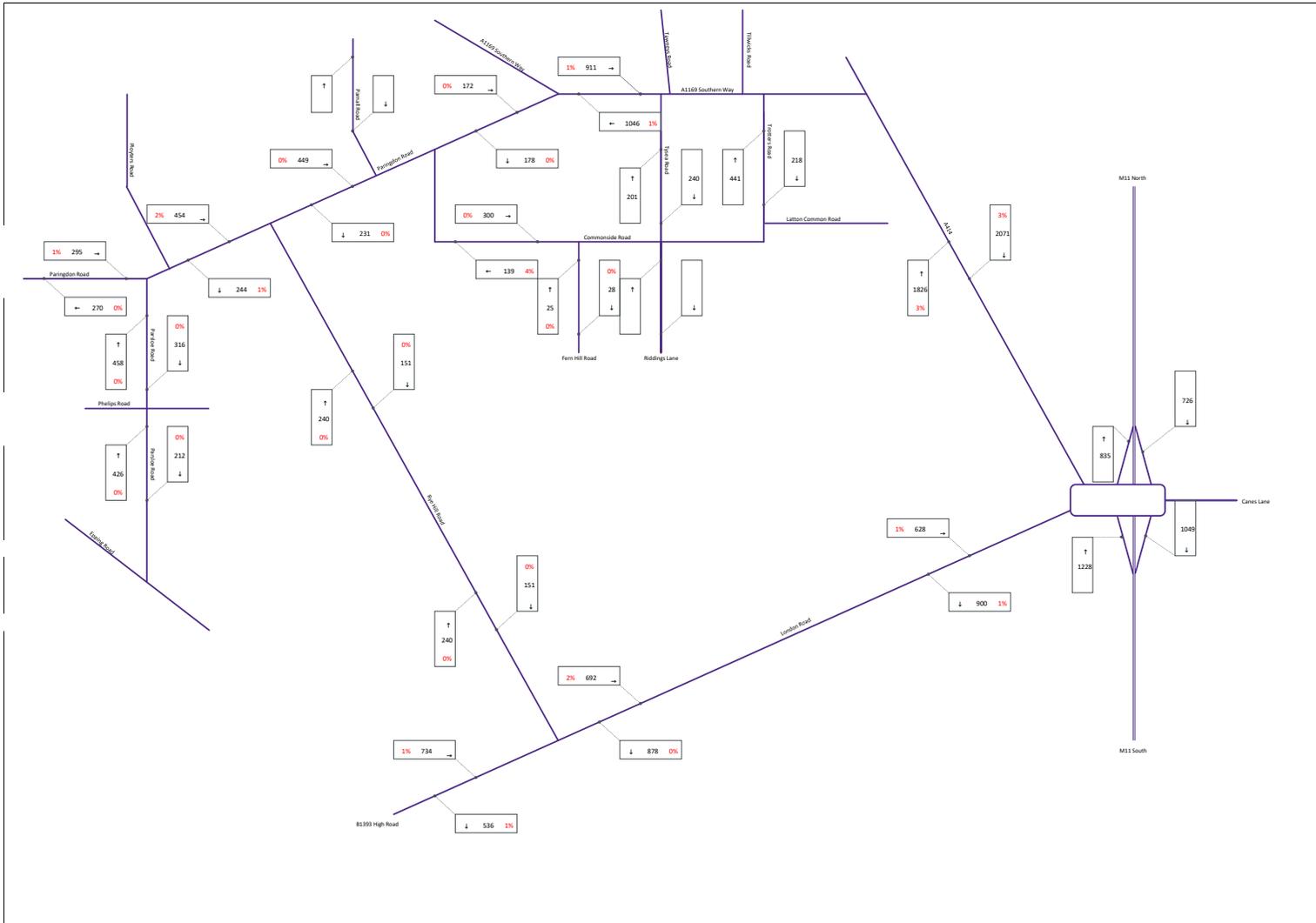
Appendix A Spreadsheet Model



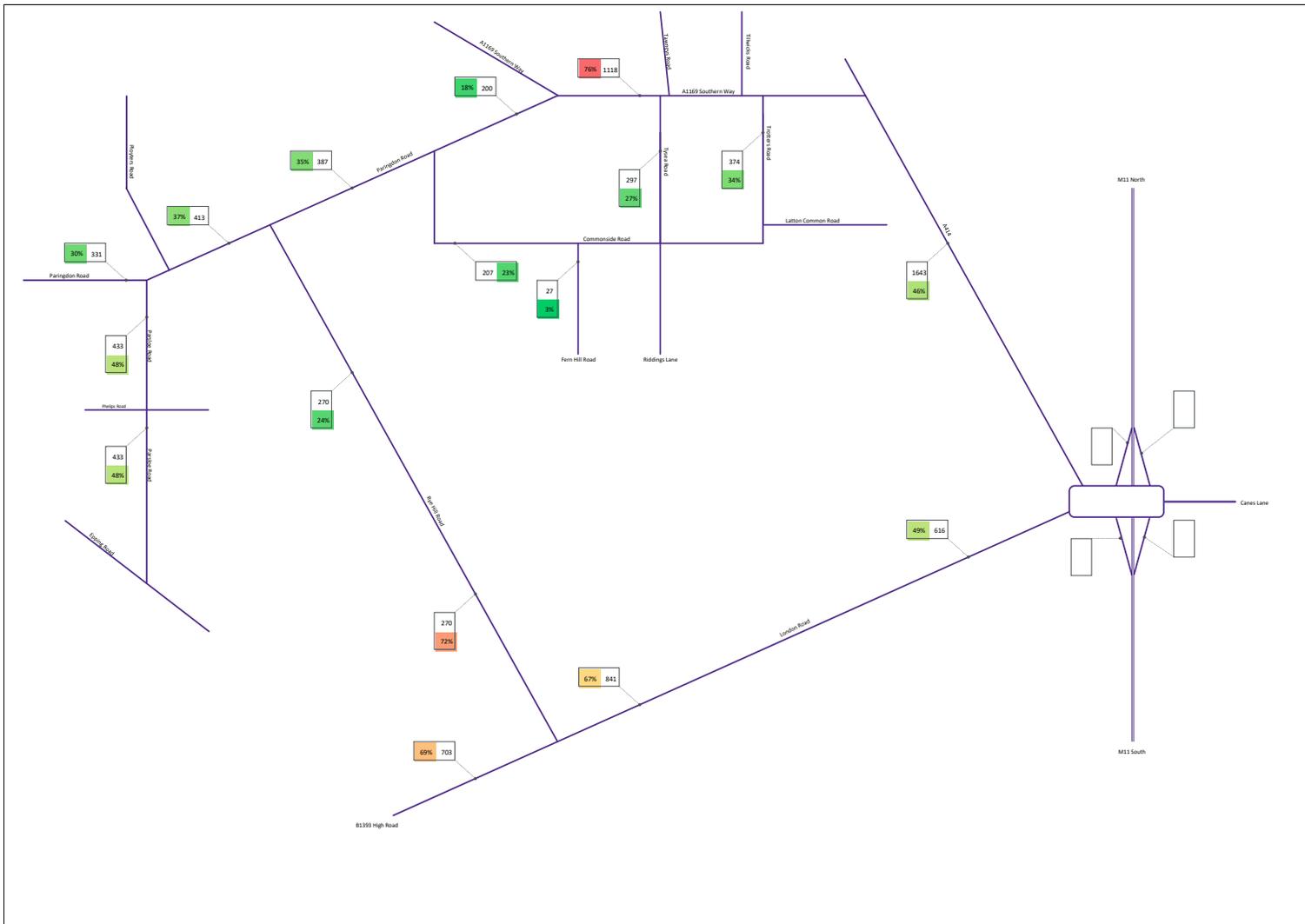
Project No.	Date	Title	Revision	Figure
4777	Jul-20	2015 PM Peak Hour Flows (17:00-18:00)	B	2
Project			Prepared By	
Luton Priory, Harlow		Notes	EK	
Client		Flows extracted from PBA TA for The Binars (application HW/7/UL/15/00229) dated May 2015	Checked By	
Epping Forest District Council				



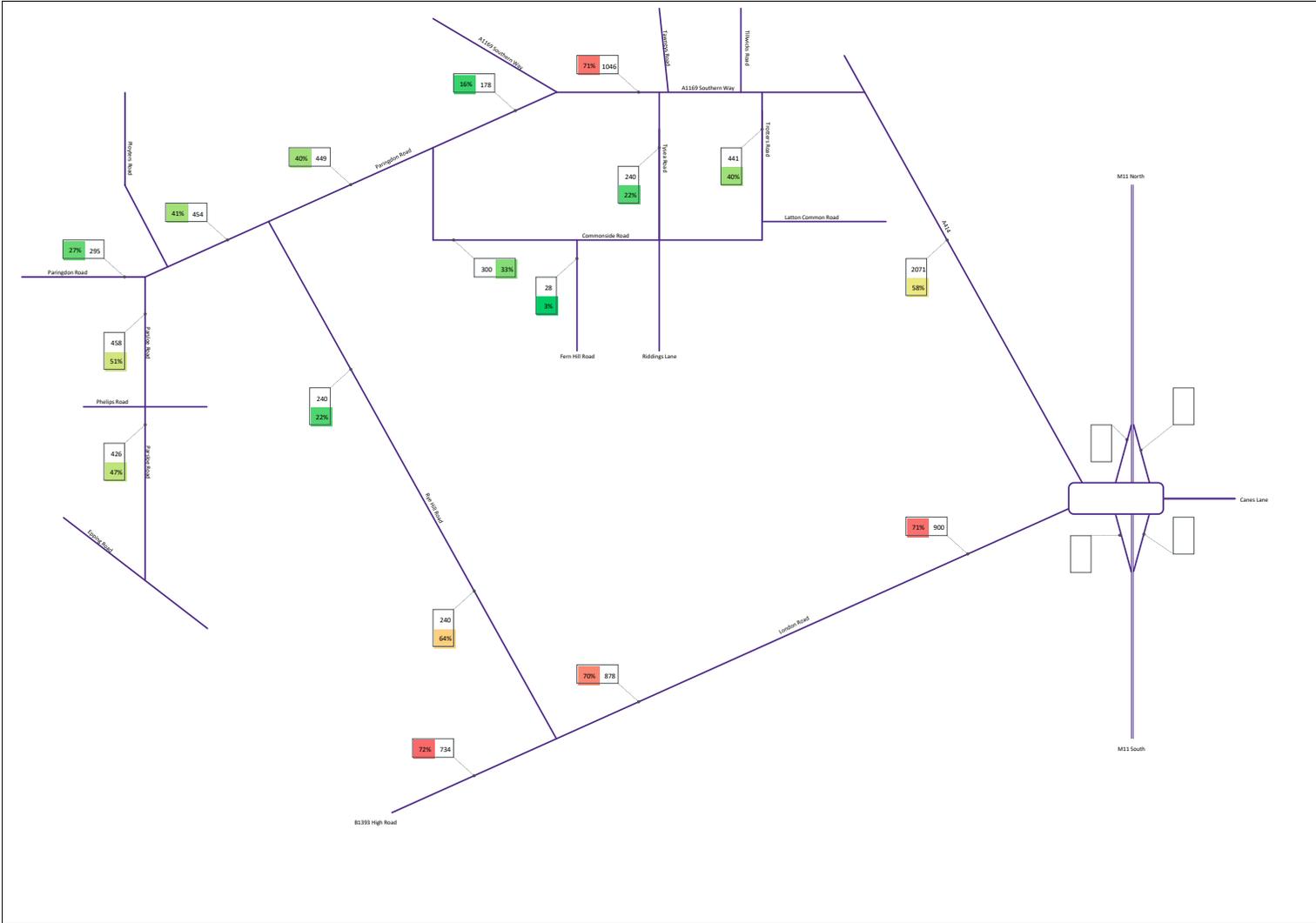
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4777	Jul-20	2019 AM Peak Base Flows (08:00-09:00)	B	5
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Client		Checked By		
Epping Forest District Council		Figures in Black = Total vehicle flow Figures in Red = HDV %		



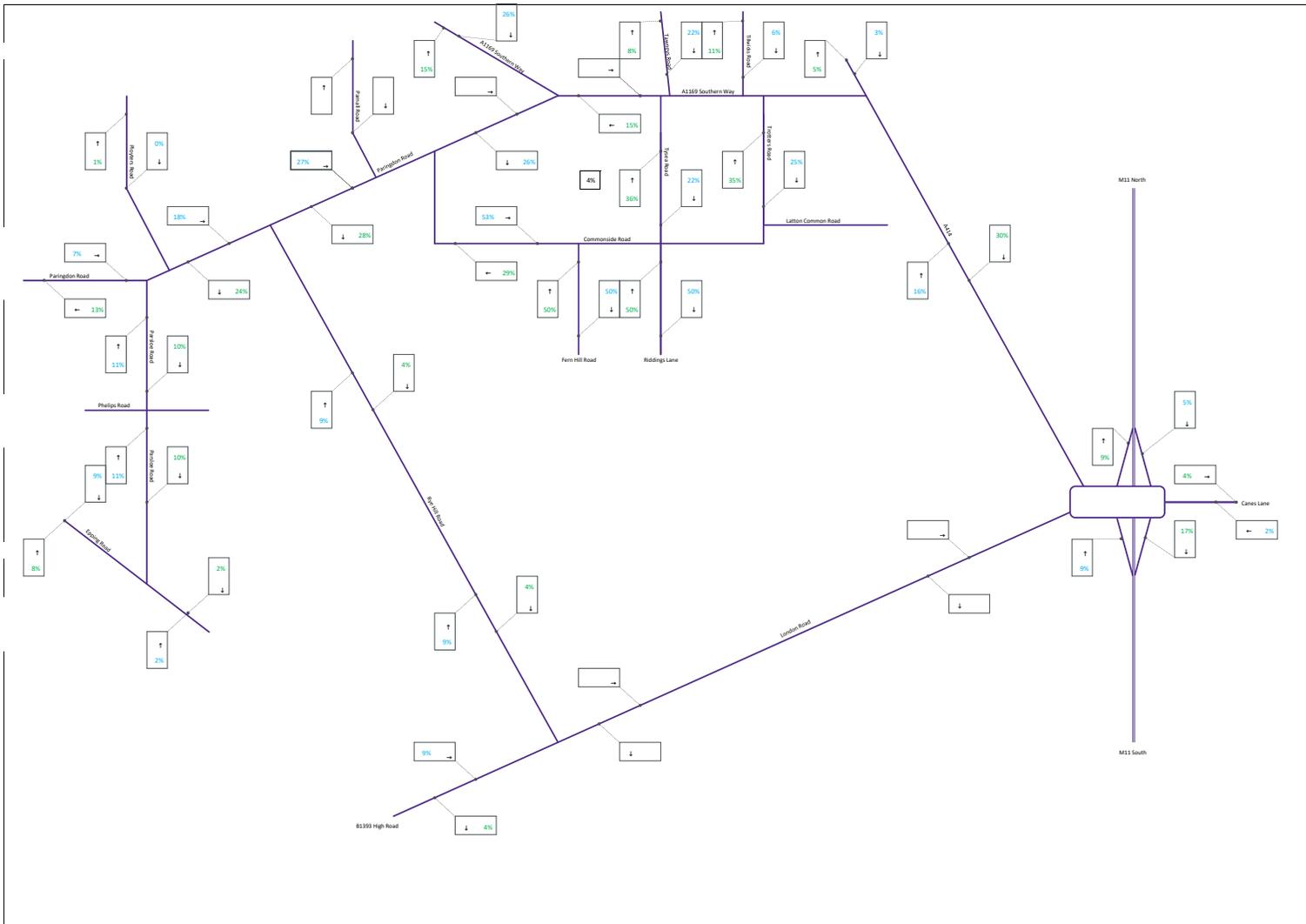
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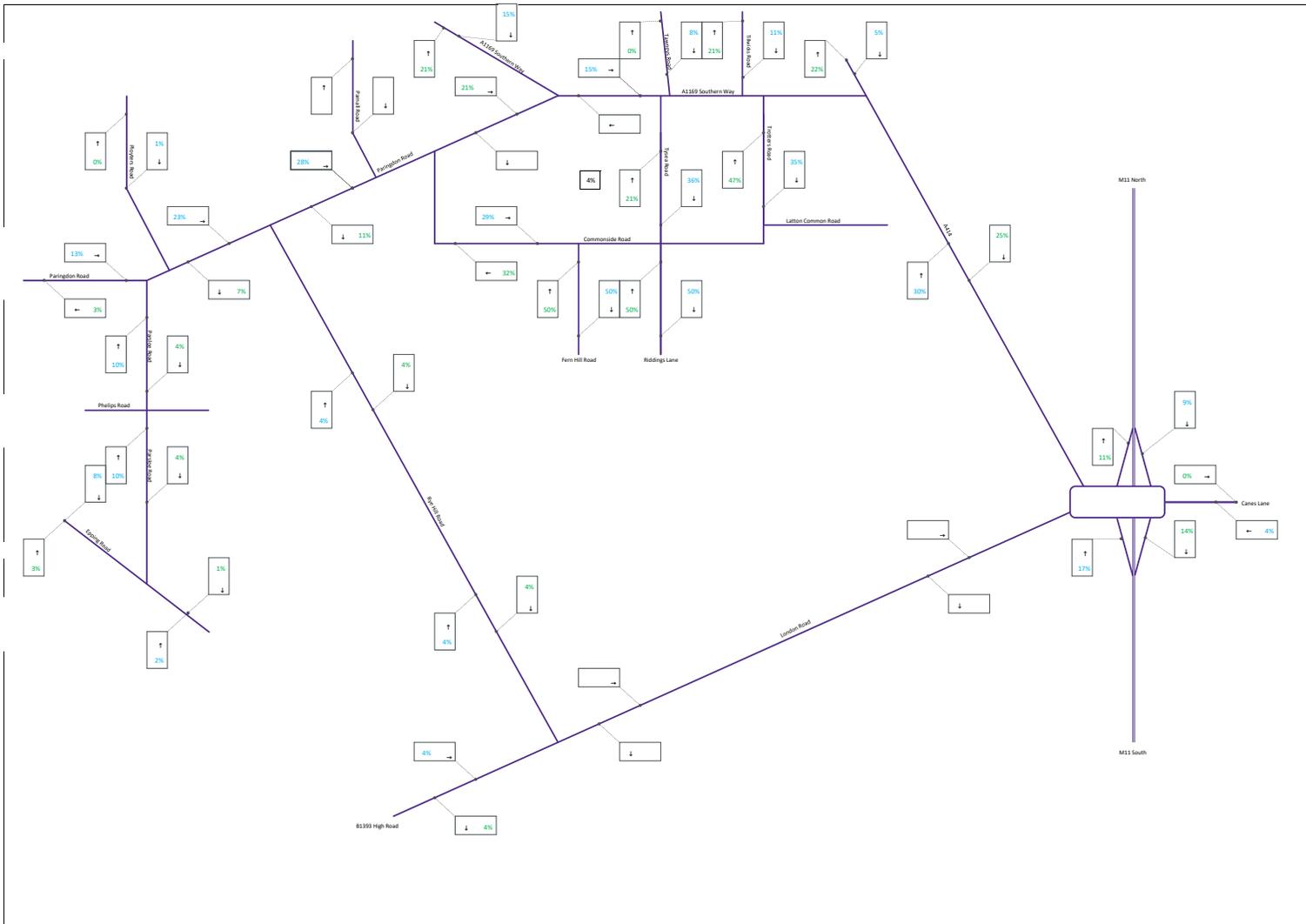
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4777	Jul-20	2019 AM Peak (08:00-09:00) Link Capacity Assessment	B	7
Project		Notes	Prepared By	
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Epping Forest District Council		Flows equal the highest directional flow during the peak hour. Percentages represent the percentage of link capacity based upon TA 79/99 capacity guidance.		



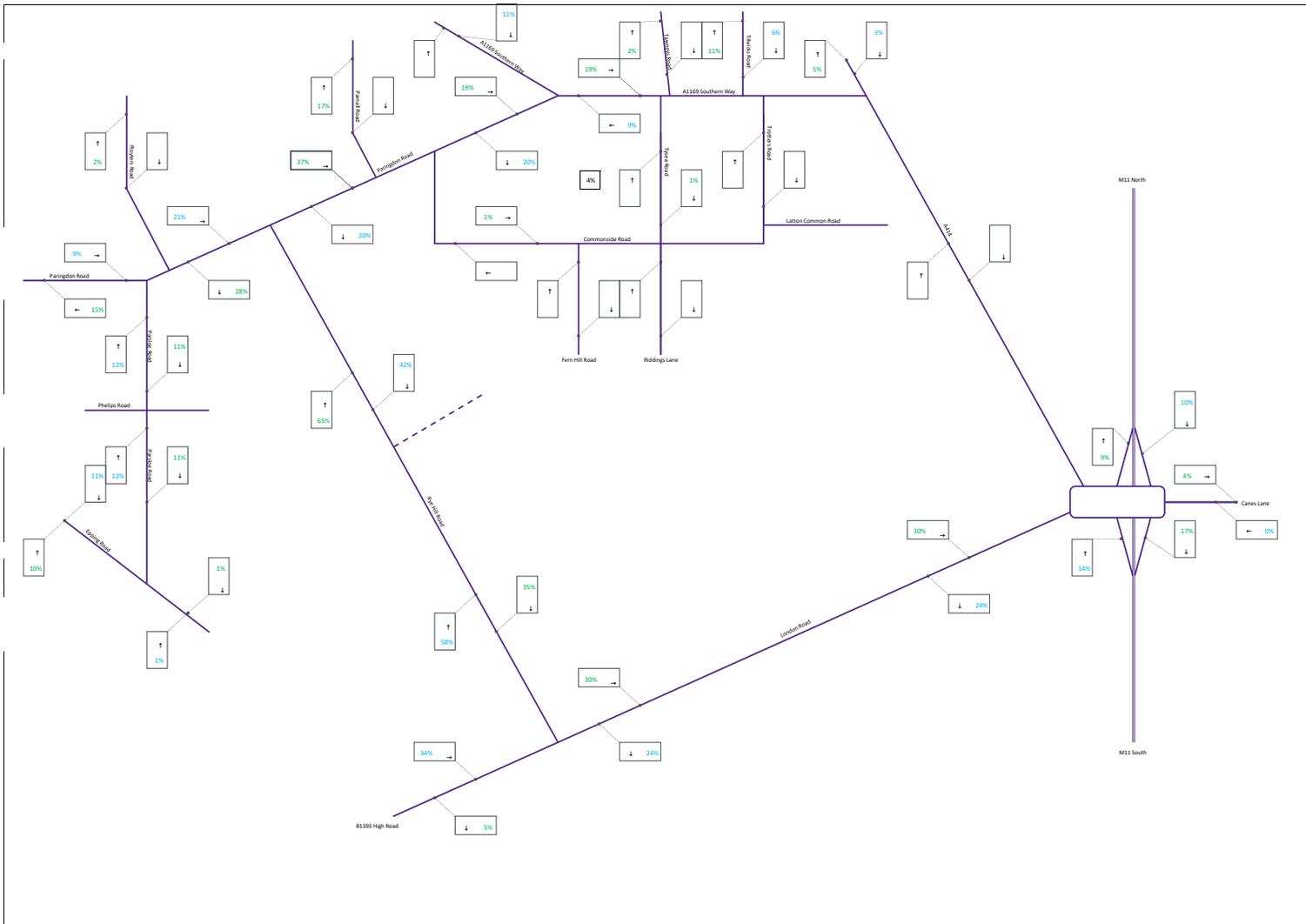
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4777	Jul-20	2019 PM Peak (17:00-18:00) Link Capacity Assessment	B	8
Project		Notes	Prepared By	
Letton Priory, Harlow			EK	
Client		Checked By		
Epping Forest District Council		Flows equal the highest directional flow during the peak hour. Percentages represent the percentage of link capacity based upon TA 79/99 capacity guidance.		



Project No.	Date	Title	Revision	Figure
4777	Jul-20	Residential Development Distribution Northern Access Points AM Peak (08:00-09:00)	B	9
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Client		Notes	Checked By	
Epping Forest District Council		Based upon Census 2011 Data for Harlow 011 MSOA Arrivals Departures		

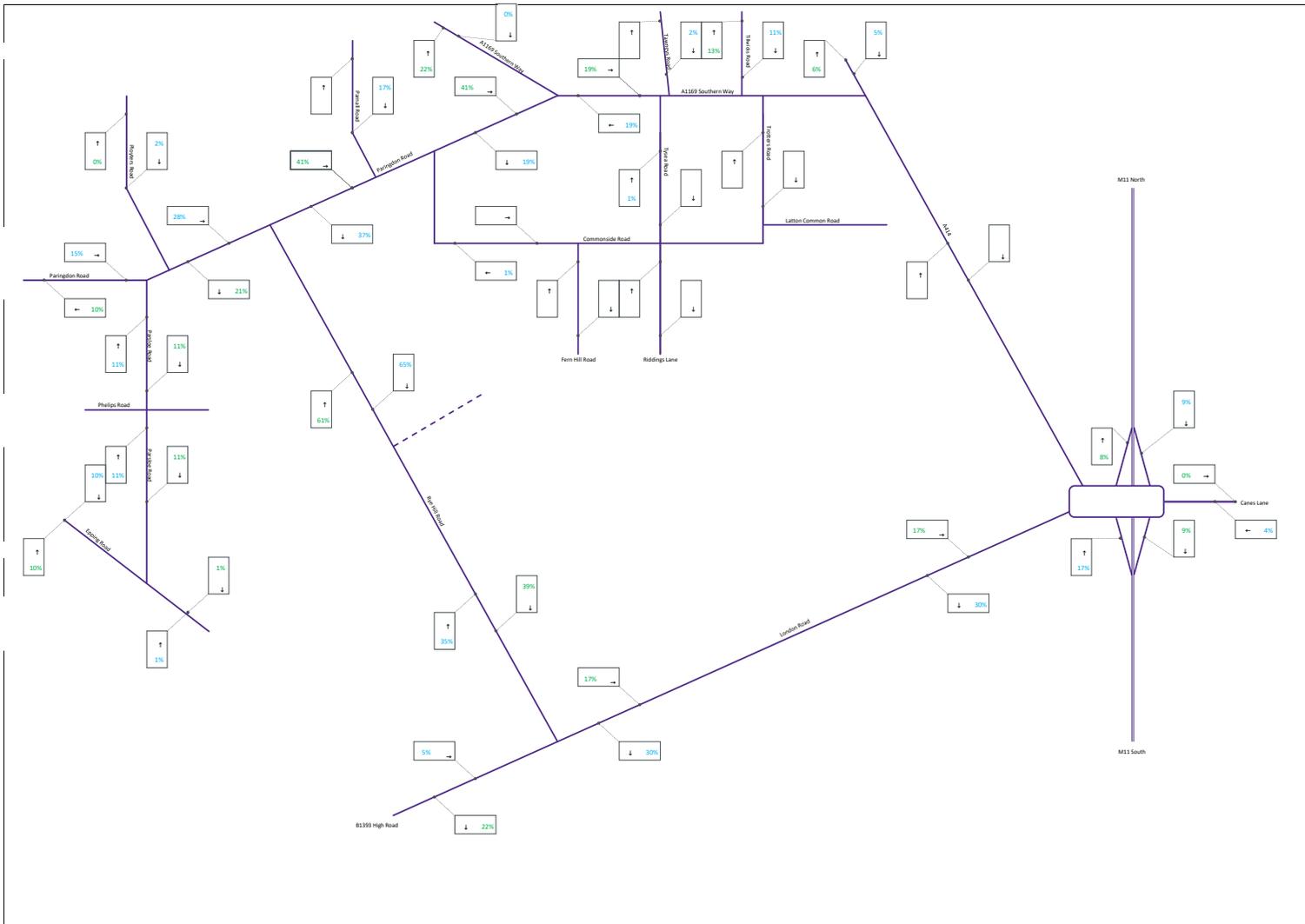


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4777	Jul-20	Residential Development Distribution Northern Access Points PM Peak (17:00-18:00)	B	10
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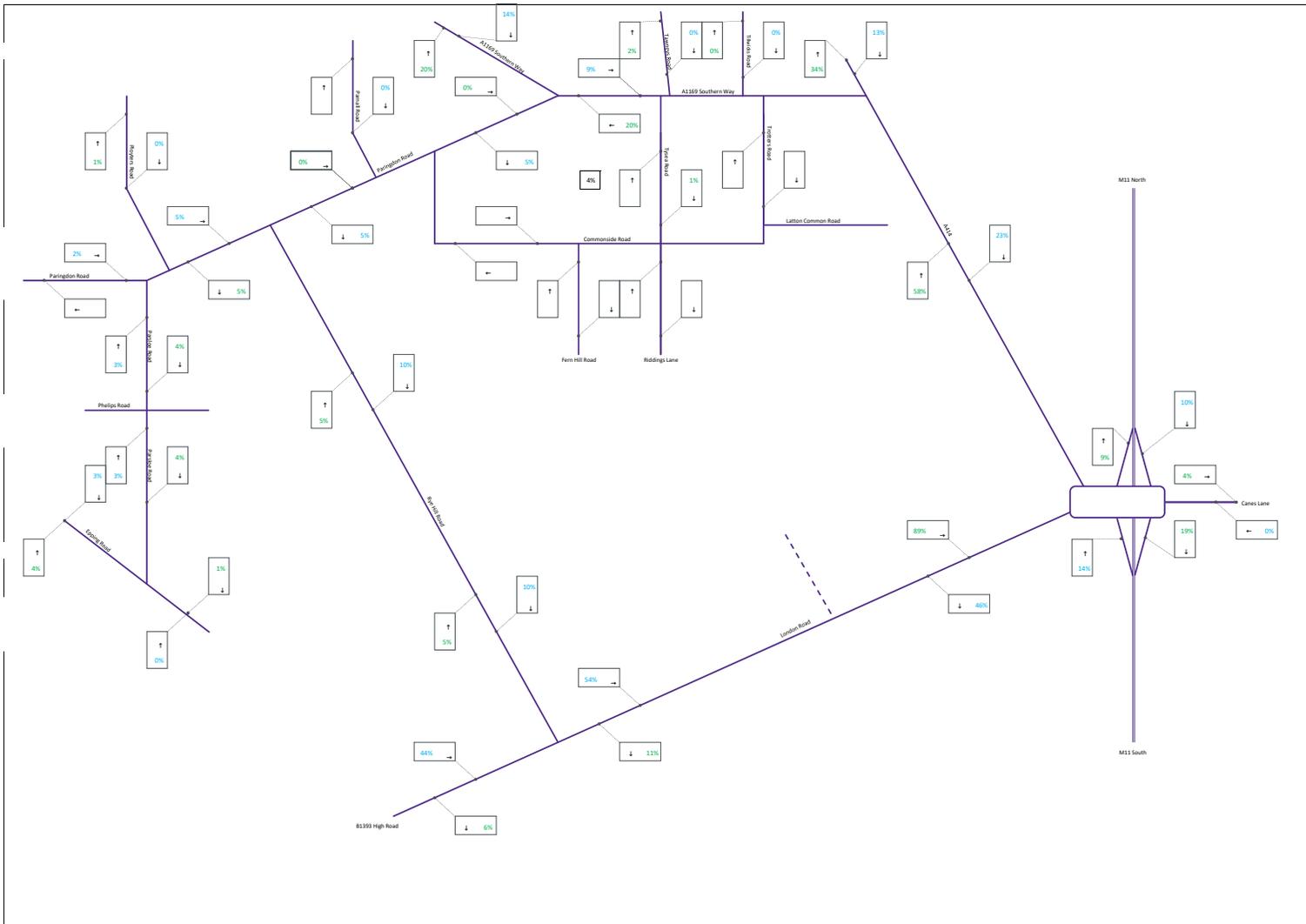


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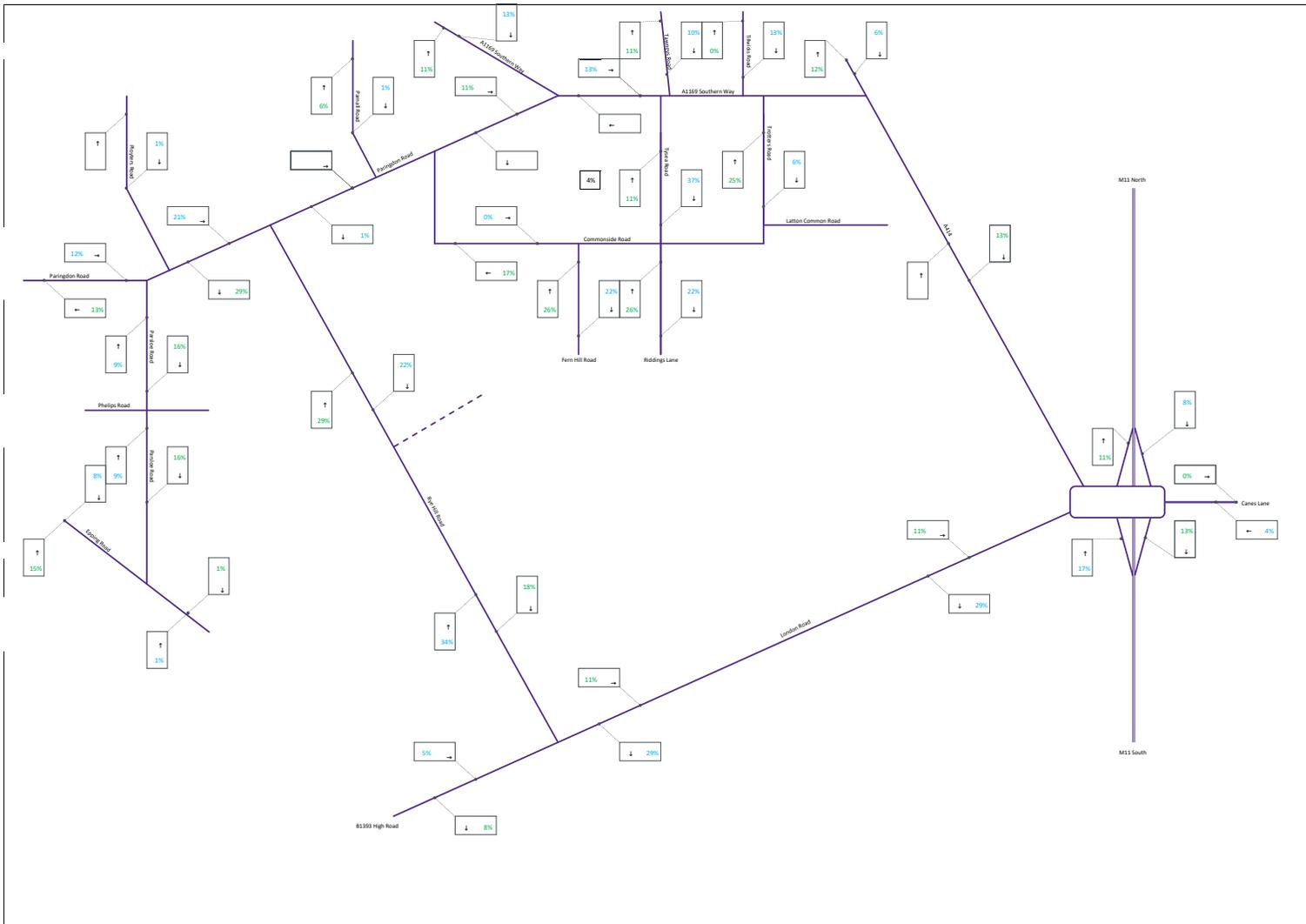




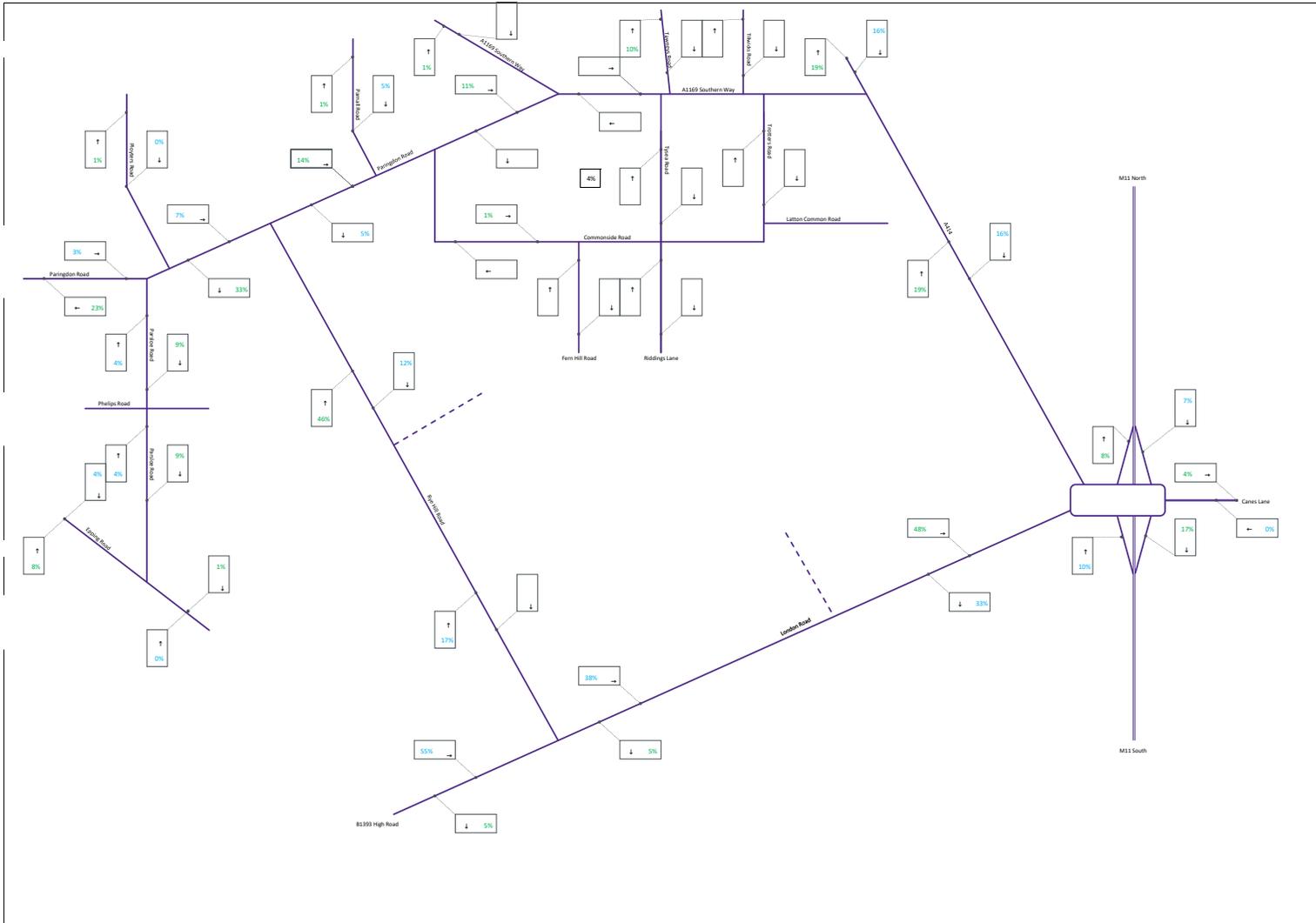
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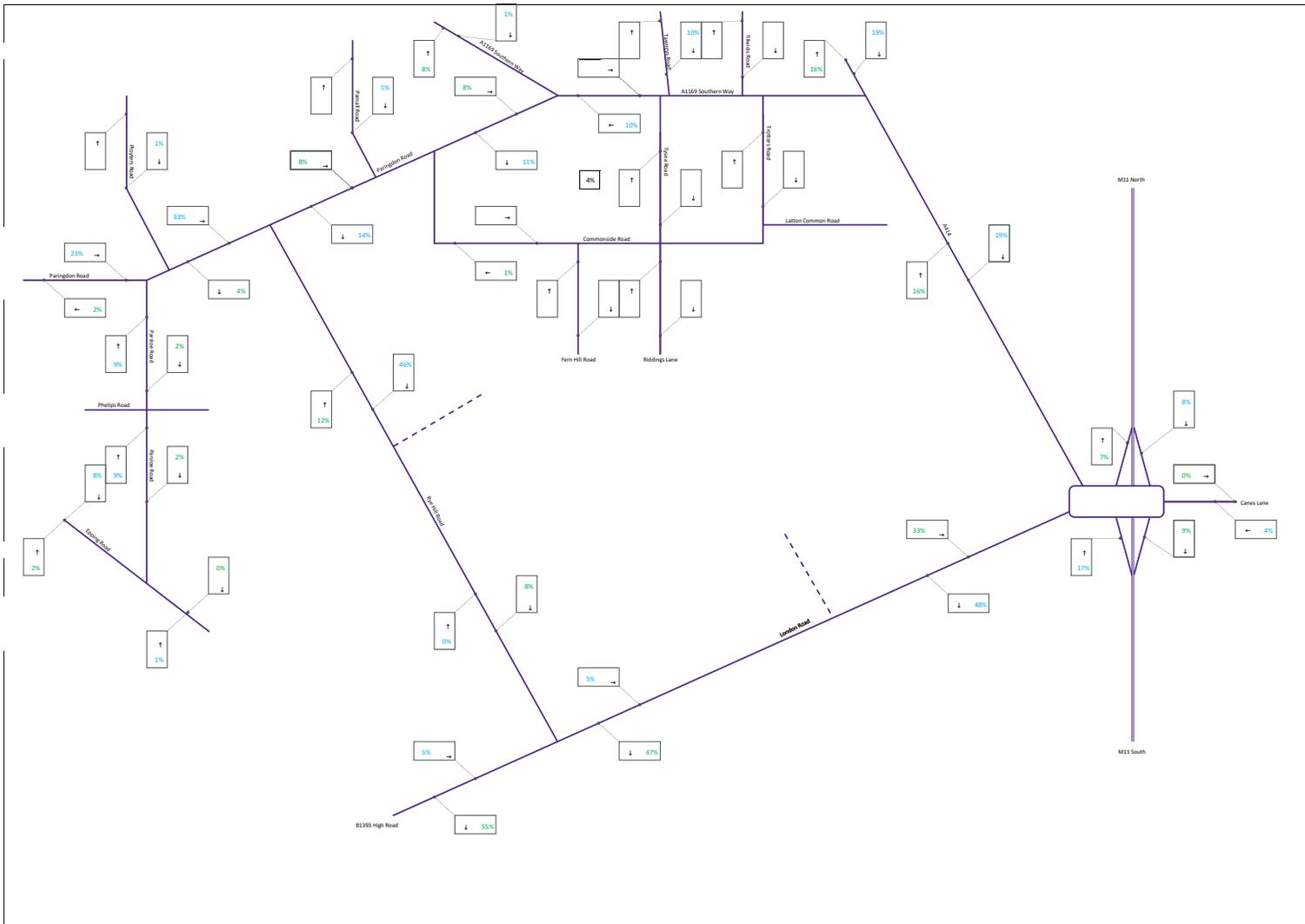
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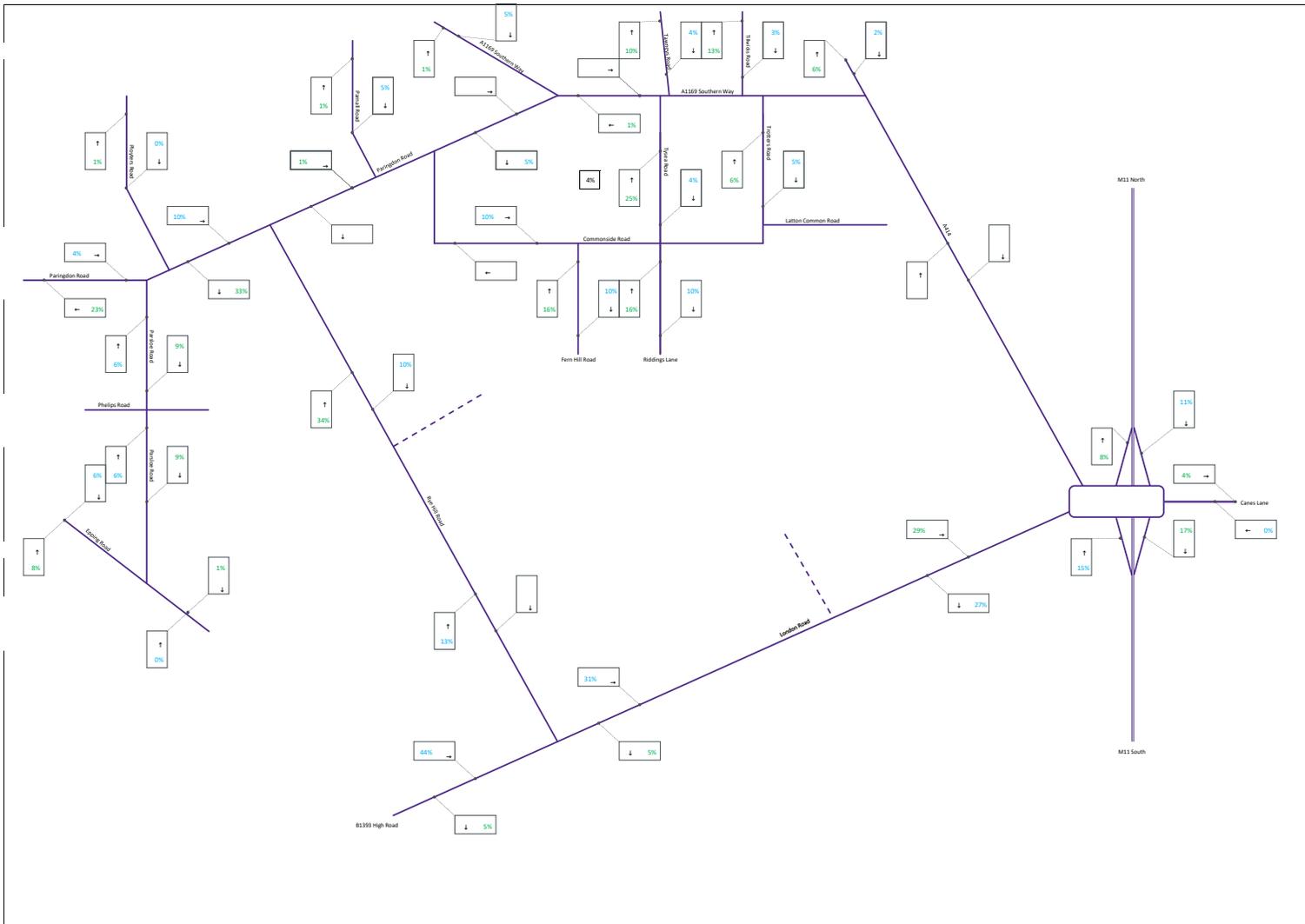
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Epping Forest District Council		Notes Based upon Census 2011 Data for Harlow 011 M50A Arrivals Departures		



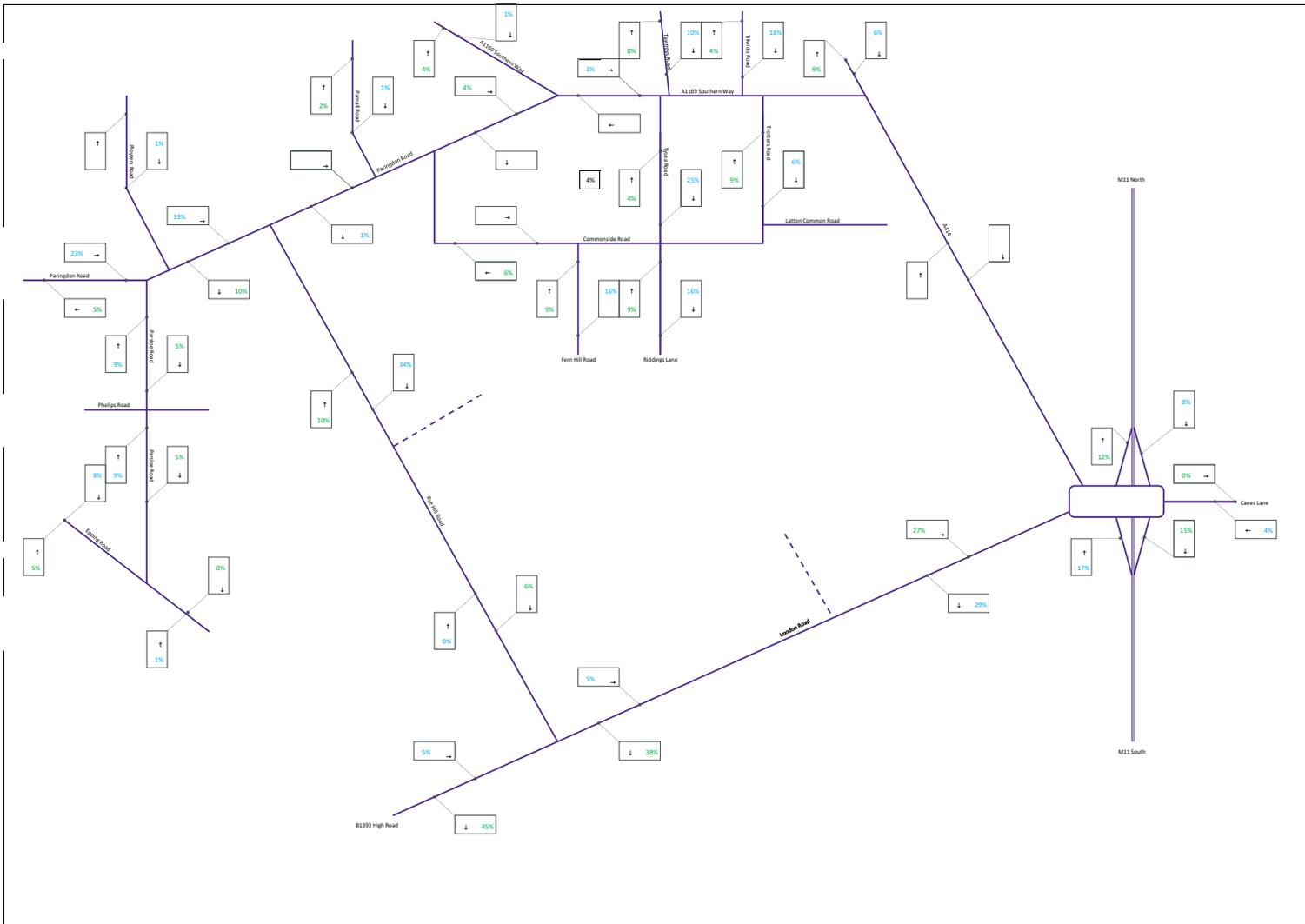
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4777	Jul-20	Residential Development Distribution Option 3 Western and Eastern Accesses AM Peak (08:00-09:00)	B	17
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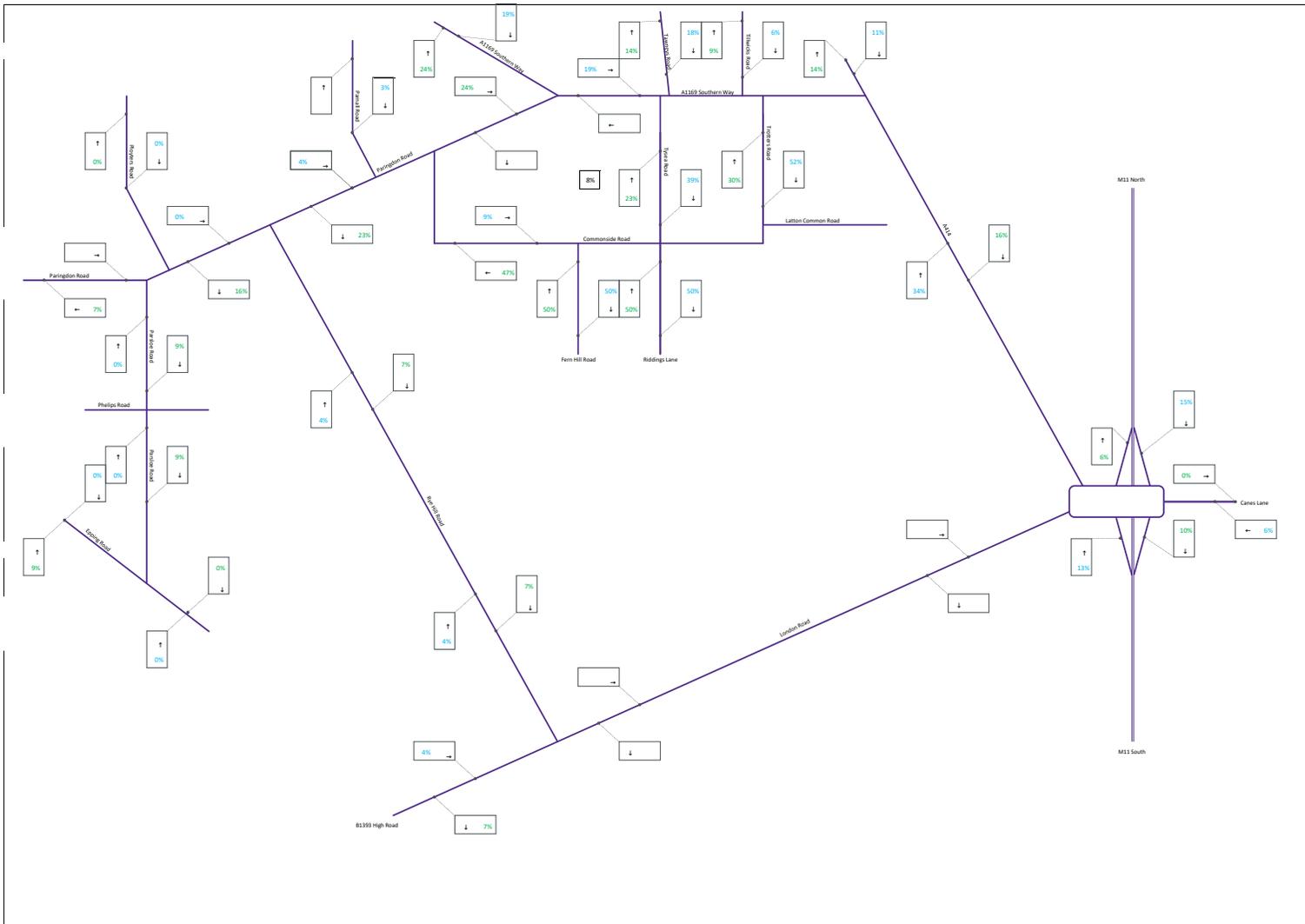
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4777	Jul-20	Residential Development Distribution Option 3 Western and Eastern Accesses PM Peak (17:00-18:00)	B	18
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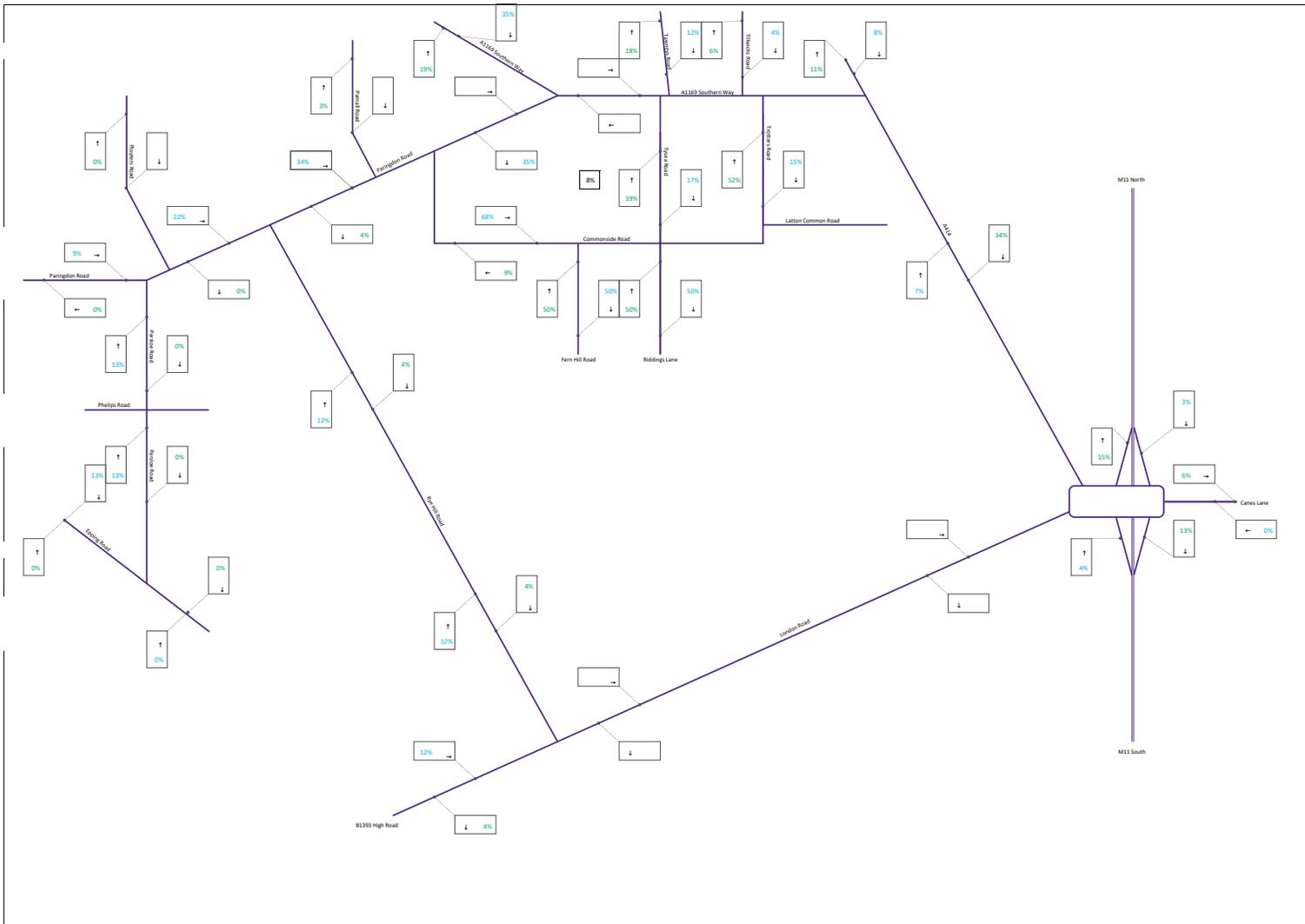
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Project		Option 4 Western, Eastern and Northern Accesses	Prepared By	
Latton Priory, Harlow		AM Peak (08:00-09:00)	EK	
Client		Notes	Checked By	
Epping Forest District Council		Based upon Census 2011 Data for Harlow 011 MSOA Arrivals Departures		



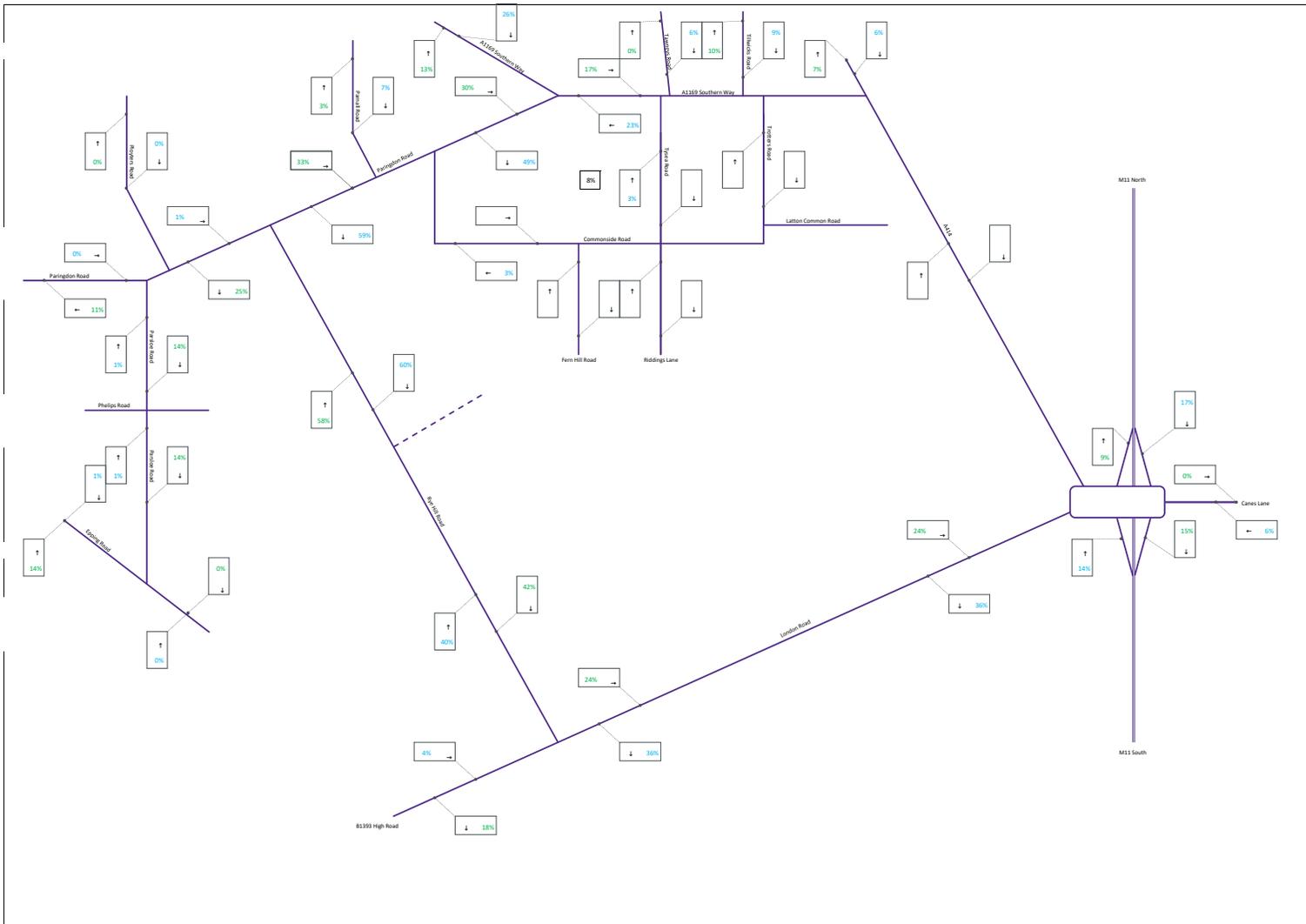
Project No.	Date	Title	Revision	Figure
4777	Jul-20	Residential Development Distribution Option 4 Western, Eastern and Northern Accesses PM Peak (17:00-18:00)	B	20
Project		Notes Based upon Census 2011 Data for Harlow 011 M50A	Prepared By	
Latton Priory, Harlow			EK	
Client		Checked By		
Epping Forest District Council				



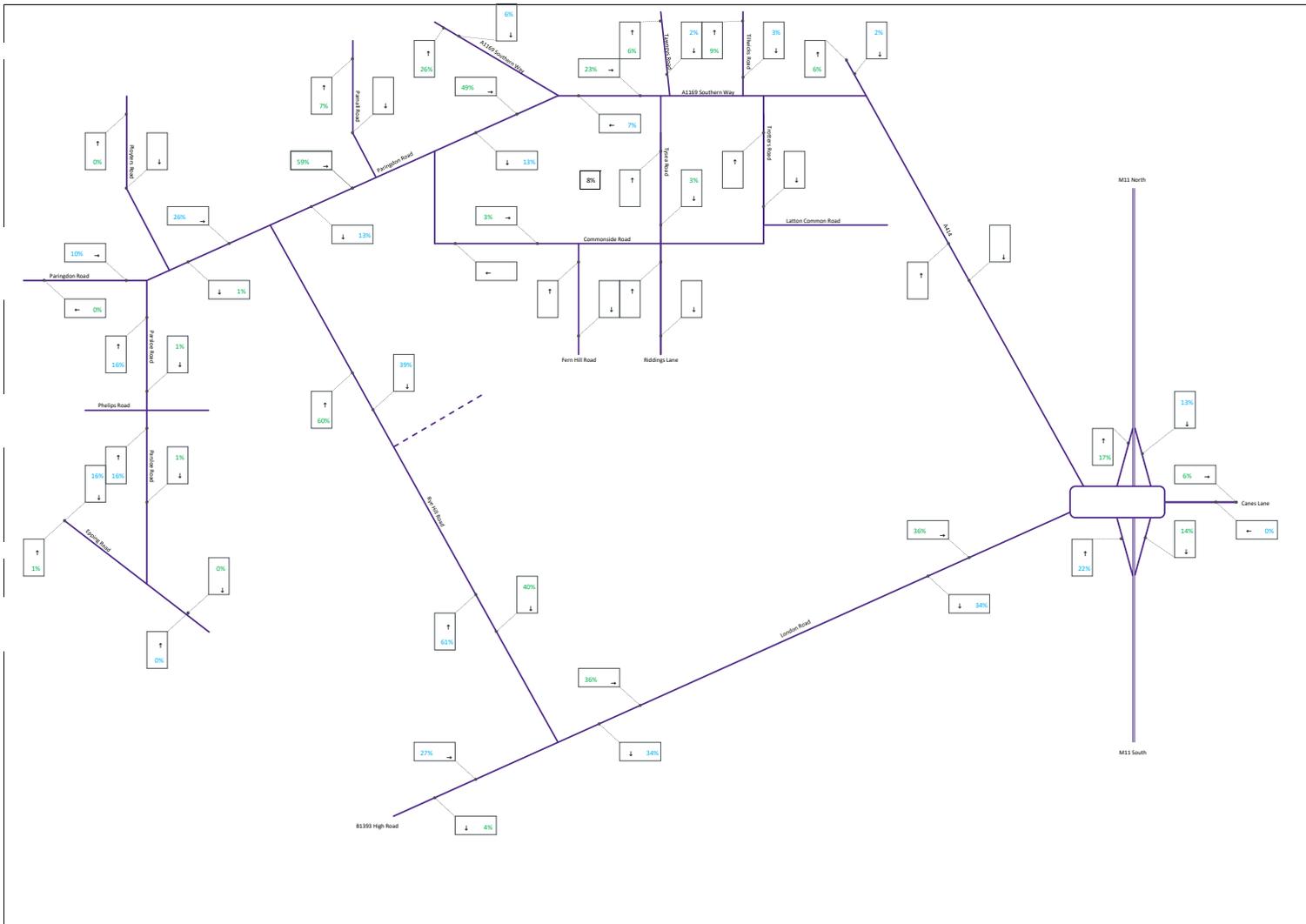
Project No.	Date	Title	Revision	Figure
4777	Jul-20	Employment Development Distribution Northern Access Points AM Peak (08:00-09:00)	B	21
Project			Prepared By	
Lutton Priory, Harlow			EK	
Client		Notes	Checked By	
Epping Forest District Council		Based upon Census 2011 data for Harlow 011 MSOA Arrivals Departures		



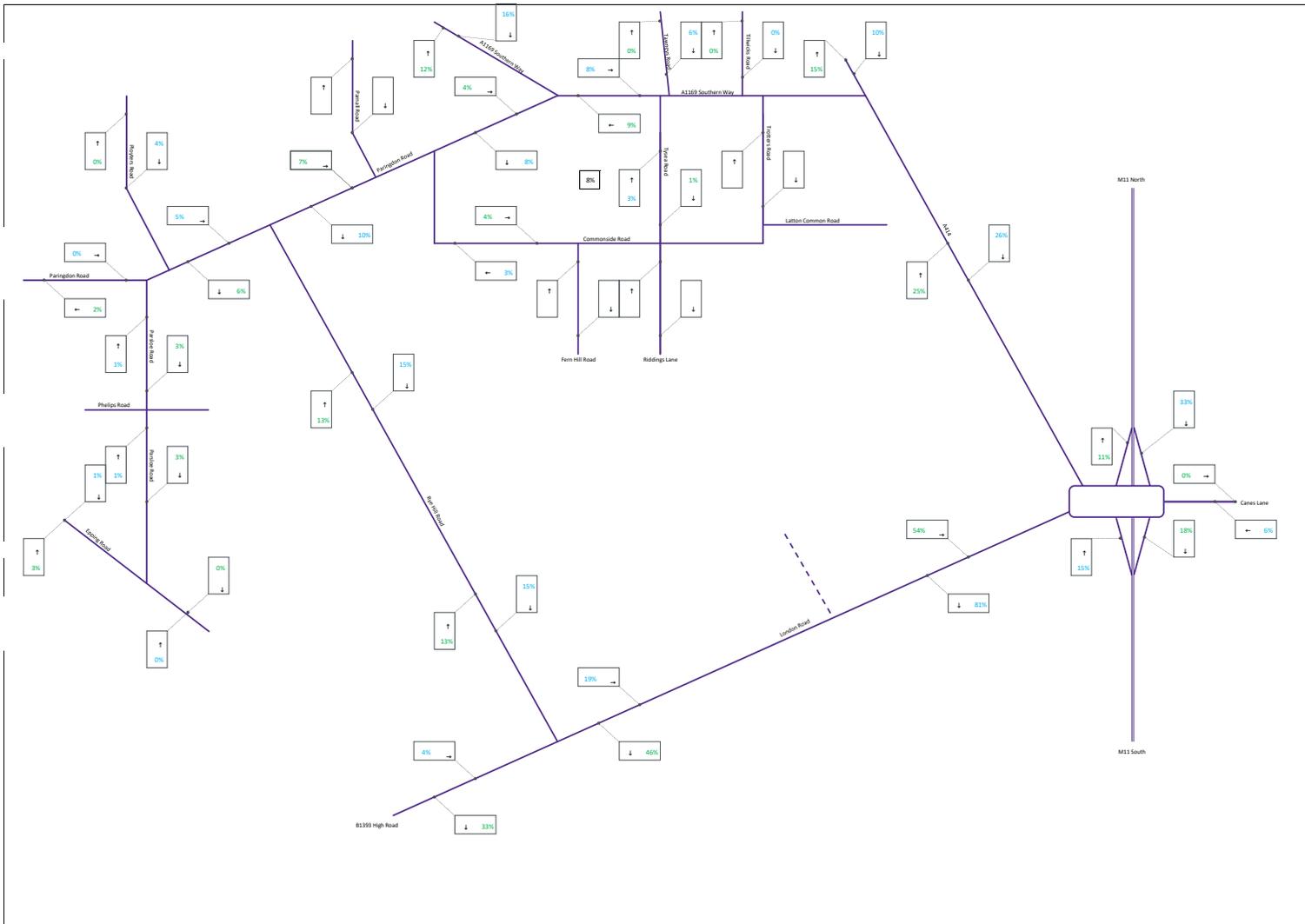
Project No.	Date	Title	Revision	Figure
4777	Jul-20	Employment Development Distribution Northern Access Points PM Peak (17:00-18:00)	B	22
Project		Notes	Prepared By	
Latton Priory, Harlow			EK	
Client		Checked By		
Epping Forest District Council		Based upon Census 2011 Data for Harlow 011 MSOA Arrivals Departures		



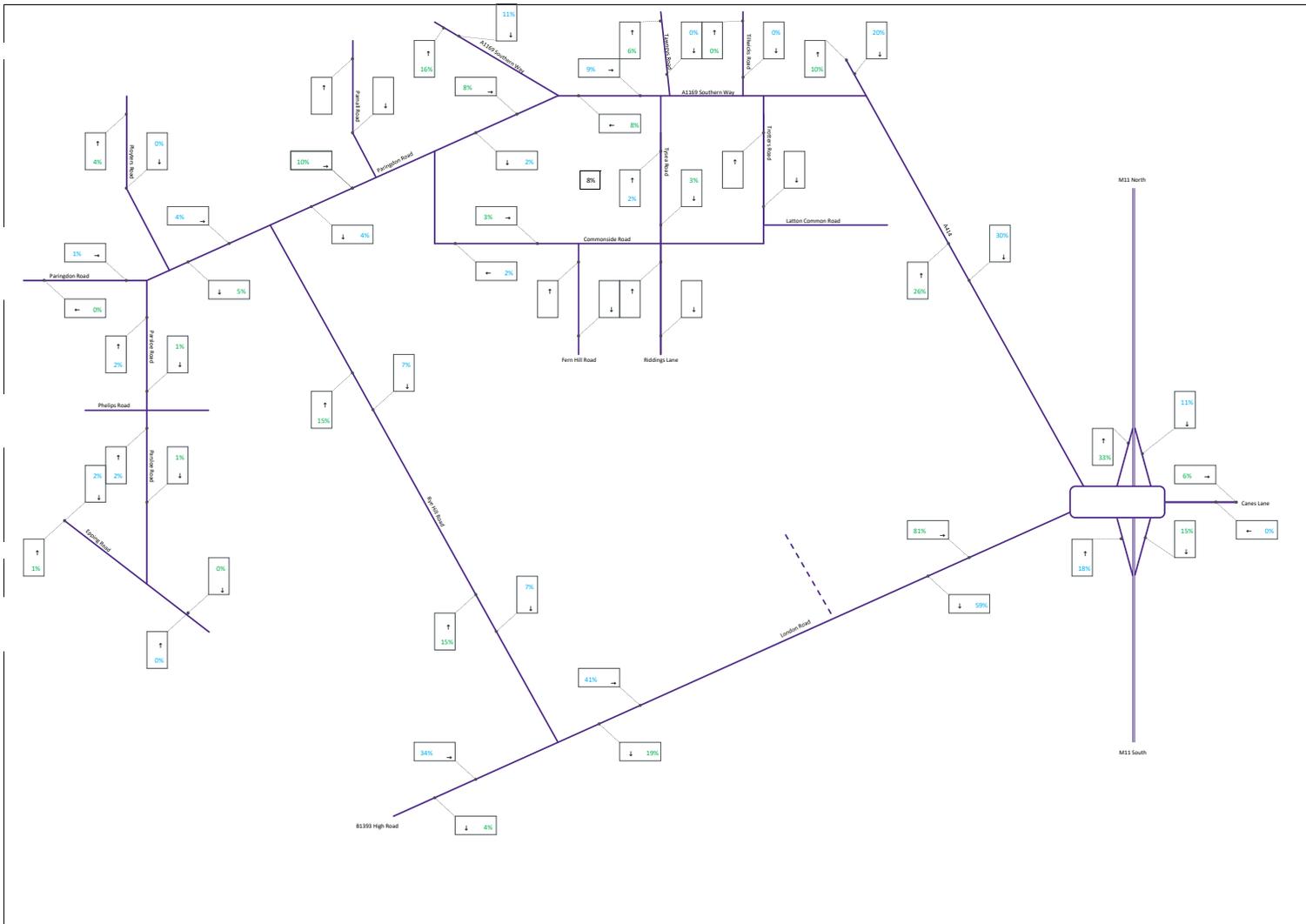
Project No.	Date	Title	Revision	Figure
4777	Jul-20	Employment Development Distribution Western Access Point AM Peak (08:00-09:00)	B	23
Project			Prepared By	
Luton Priory, Harlow			EK	
Client		Notes	Checked By	
Epping Forest District Council		Based upon Census 2011 Data for Harlow 011 MSOA Arrivals Departures		



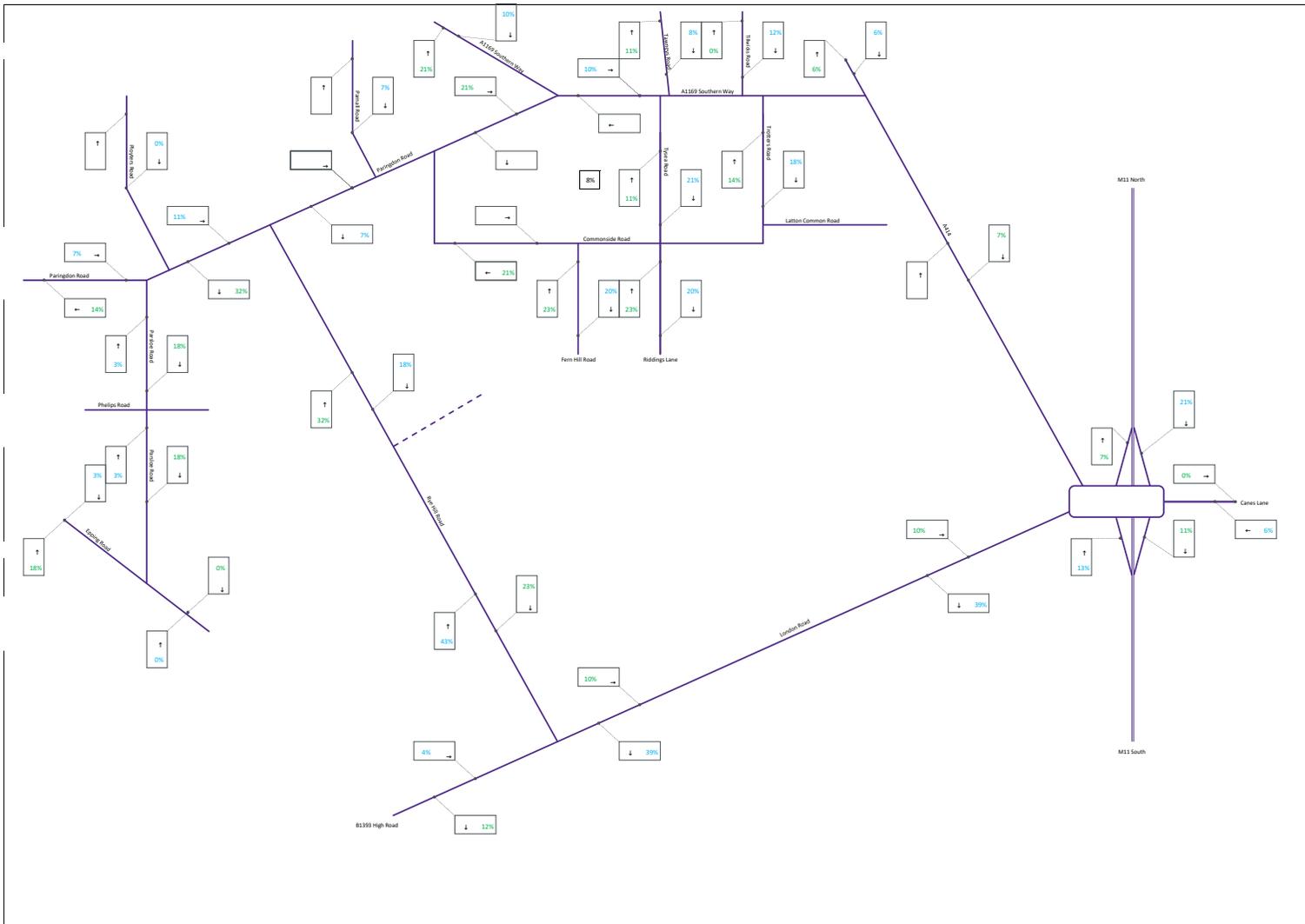
Project No.	Date	Title	Revision	Figure
4777	Jul-20	Employment Development Distribution Western Access Point PM Peak (17:00-18:00)	B	24
Project			Prepared By	
Luton Priority, Harlow			EK	
Client		Checked By		
Epping Forest District Council		Notes Based upon Census 2011 Data for Harlow 011 MSOA Arrivals Departures		



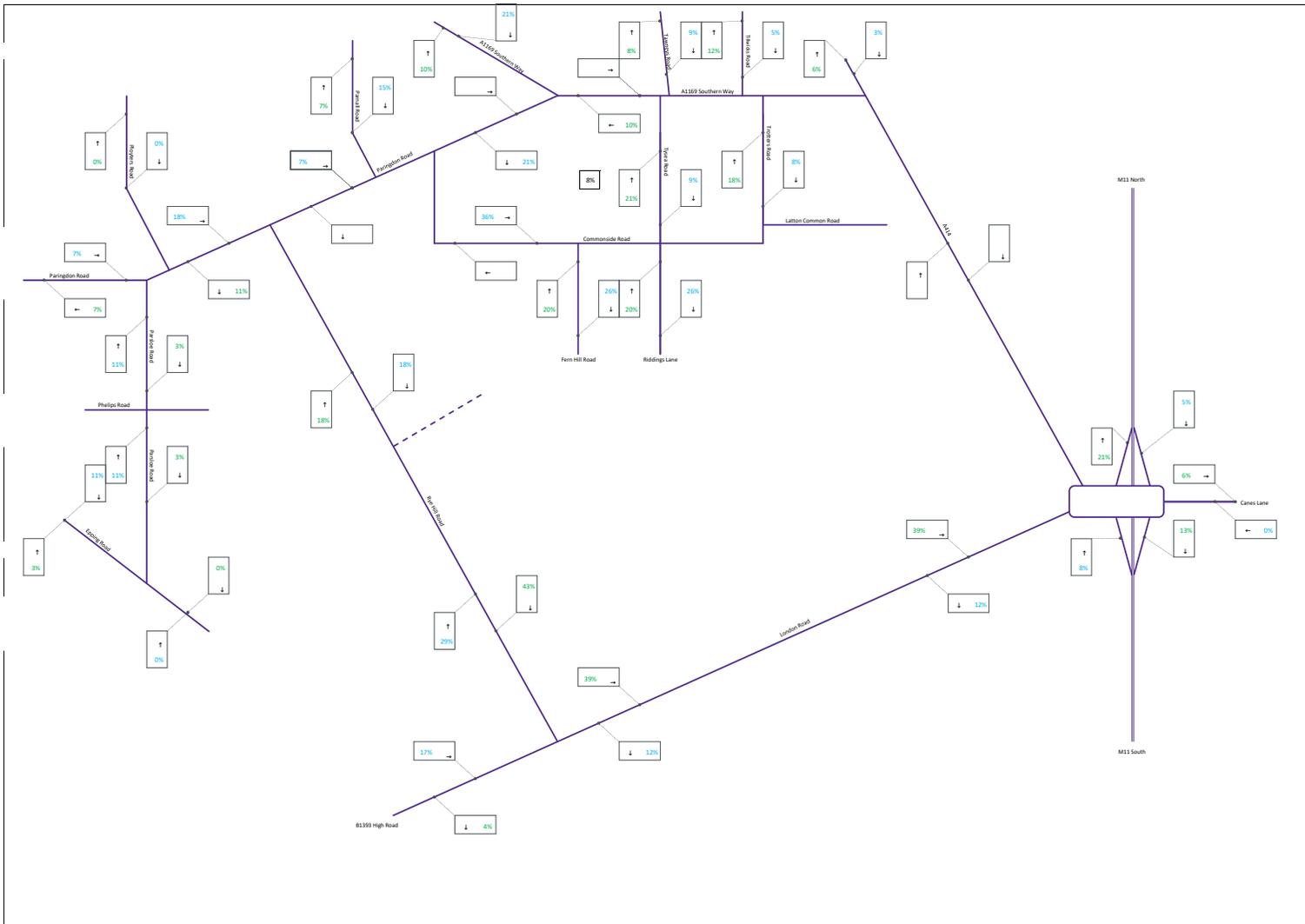
Project No.	Date	Title	Revision	Figure
4777	Jul-20	Employment Development Distribution Eastern Access Point AM Peak (08:00-09:00)	B	25
Project			Prepared By	
Letton Priory, Harlow			EK	
Client		Notes	Checked By	
Epping Forest District Council		Based upon Census 2011 Data for Harlow 011 MSOA Arrivals Departures		



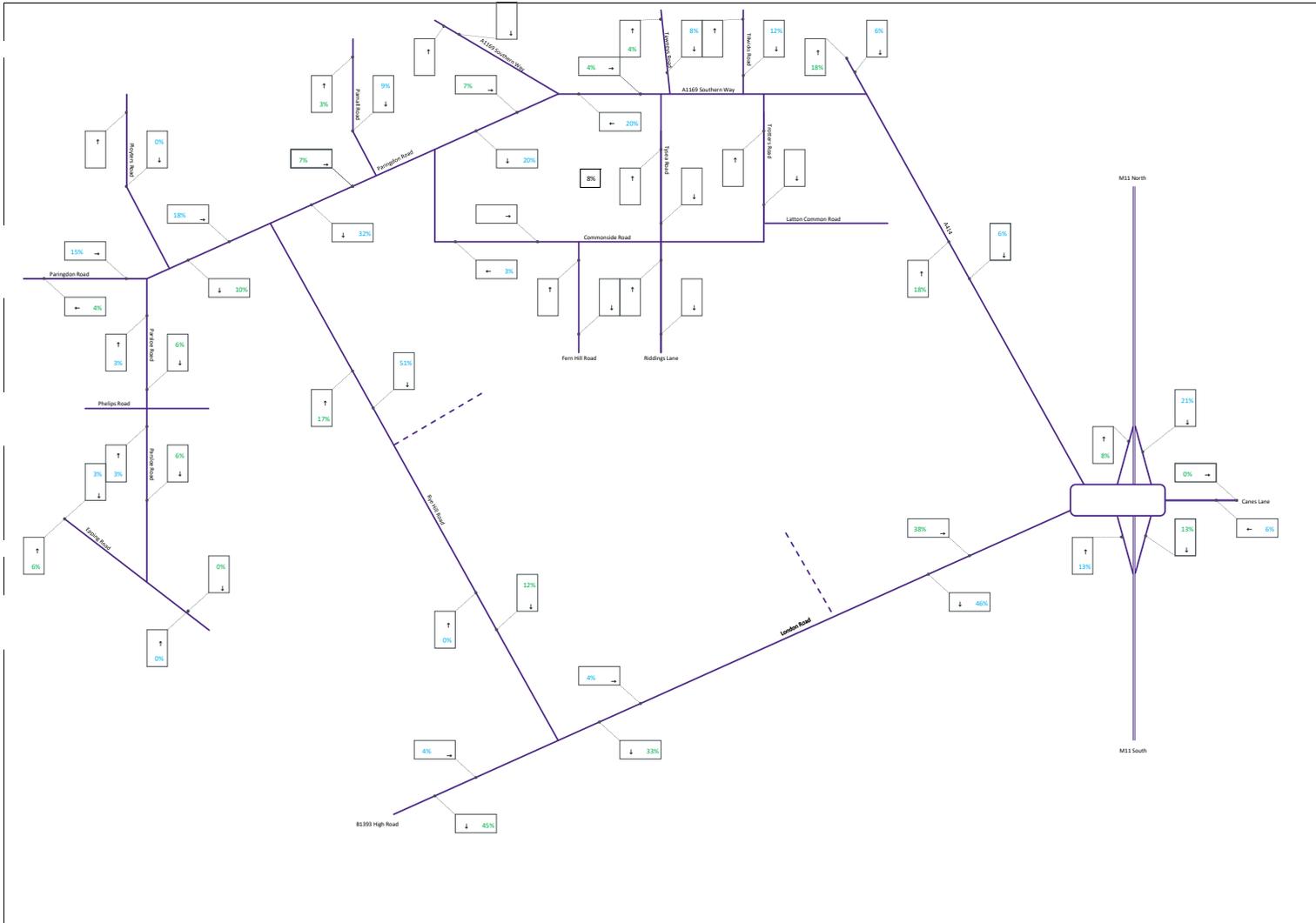
Project No.	Date	Title	Revision	Figure
4777	Jul-20	Employment Development Distribution Eastern Access Point AM Peak (17:00-18:00)	B	26
Project			Prepared By	
Luton Priority, Harlow			EK	
Client		Notes	Checked By	
Epping Forest District Council		Based upon Census 2011 data for Harlow 011 MSOA Arrivals Departures		



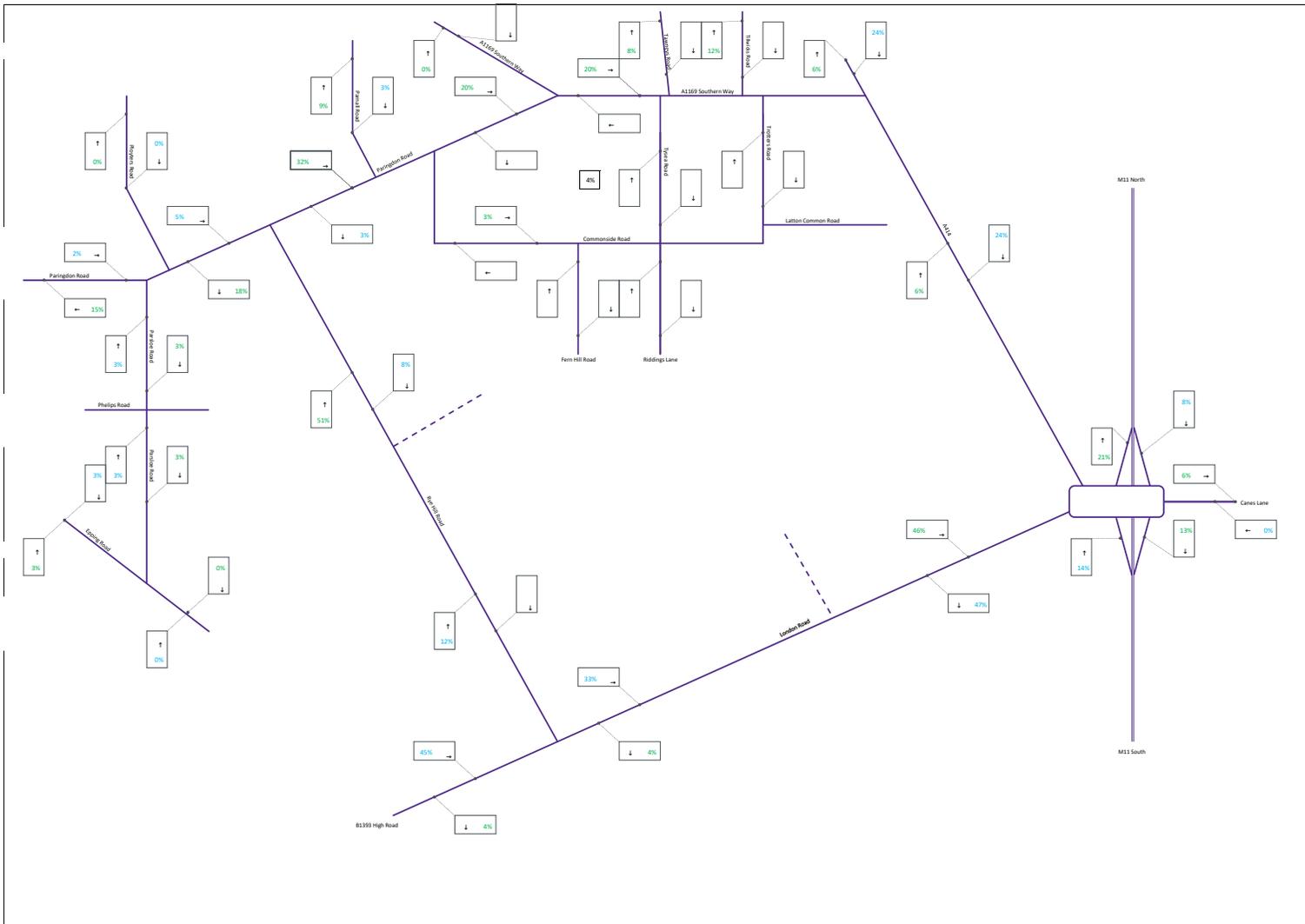
Project No.	Date	Title	Revision	Figure
4777	Jul-20	Employment Development Distribution Option 2 Western and Northern Accesses AM Peak (08:00-09:00)	B	27
Project		Notes Based upon Census 2011 Data for Harlow 011 M50A Arrivals Departures	Prepared By	
Latton Priory, Harlow			EK	
Client		Checked By		
Epping Forest District Council				



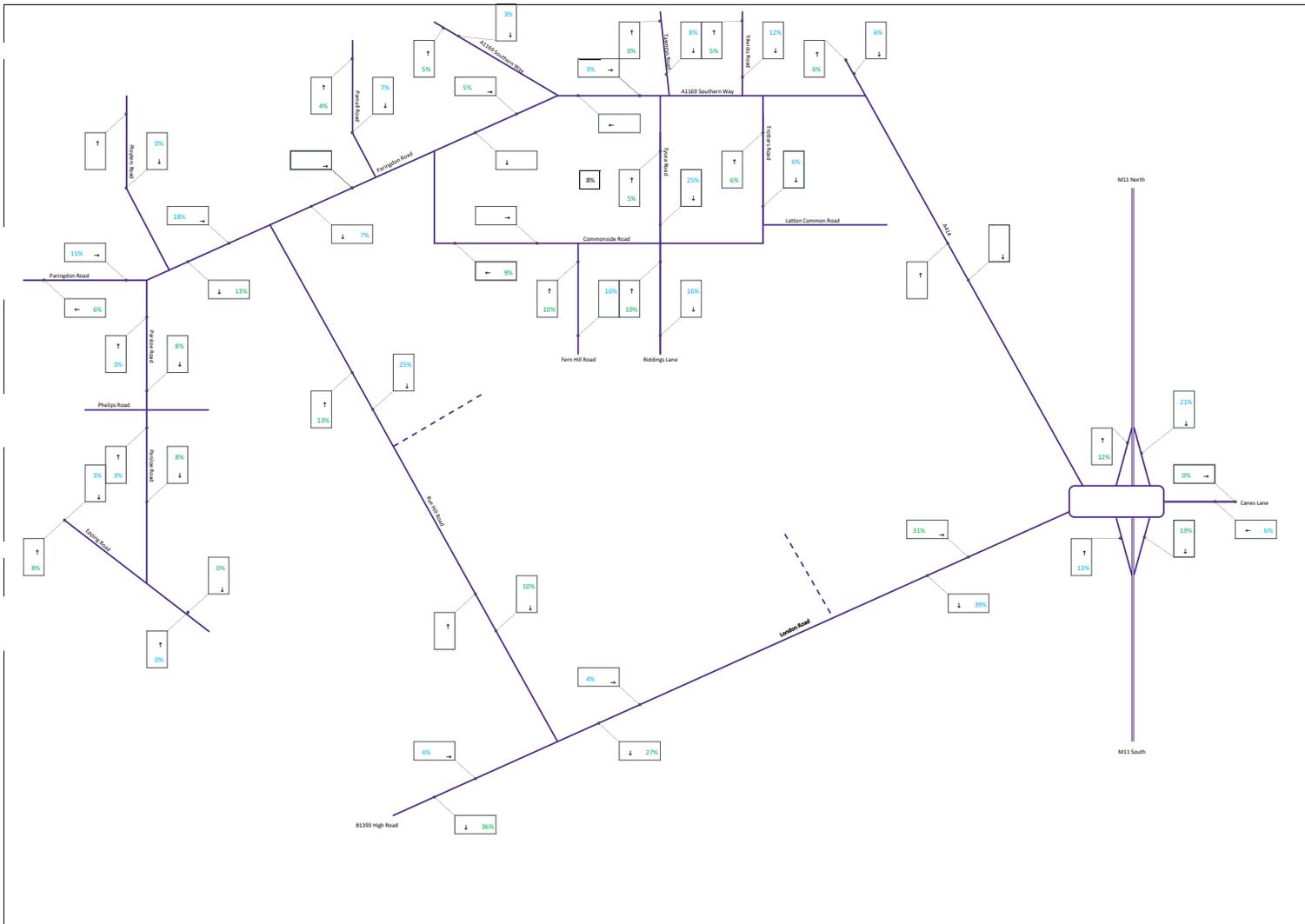
Project No.	Date	Title	Revision	Figure
4777	Jul-20	Employment Development Distribution Option 2 Western and Northern Accesses PM Peak (17:00-18:00)	B	28
Project		Notes	Prepared By	
Lutton Priory, Harlow			EK	
Client		Checked By		
Epping Forest District Council		Arrivals Departures		



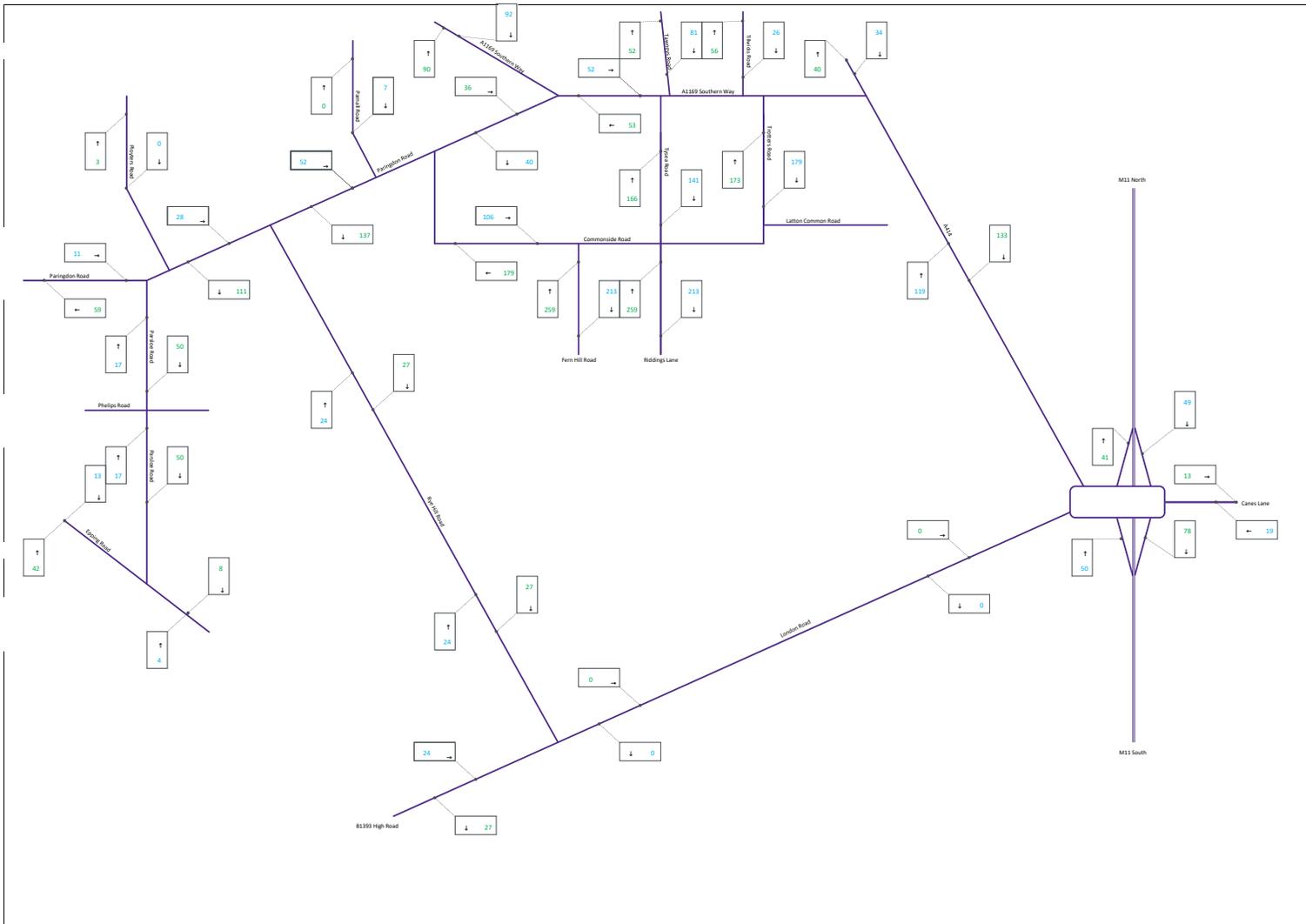
Project No.	Date	Title	Revision	Figure
4777	Jul-20	Employment Development Distribution Option 3 Western and Eastern Accesses AM Peak (08:00-09:00)	B	29
Project		Notes Based upon Census 2011 Data for Harlow 011 MSOA	Prepared By	
Lutton Priory, Harlow			EK	
Client		Checked By		
Epping Forest District Council				



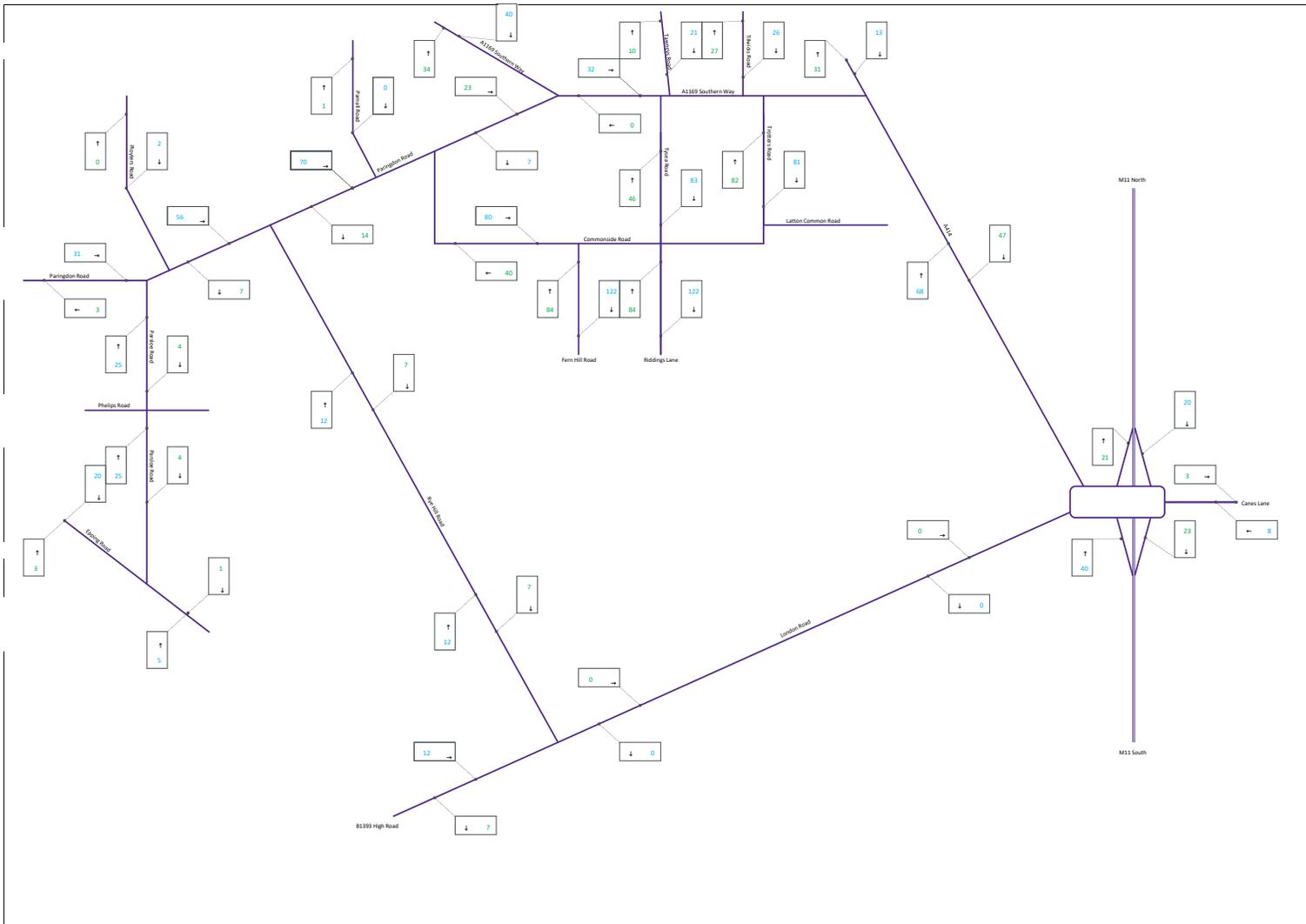
Project No.	Date	Title	Revision	Figure
4777	Jul-20	Employment Development Distribution Option 3 Western and Eastern Accesses PM Peak (17:00-18:00)	B	30
Project			Prepared By	
Lutton Priory, Harlow			EK	
Client		Checked By		
Epping Forest District Council		Notes Based upon Census 2011 Data for Harlow 011 MSOA Arrivals Departures		



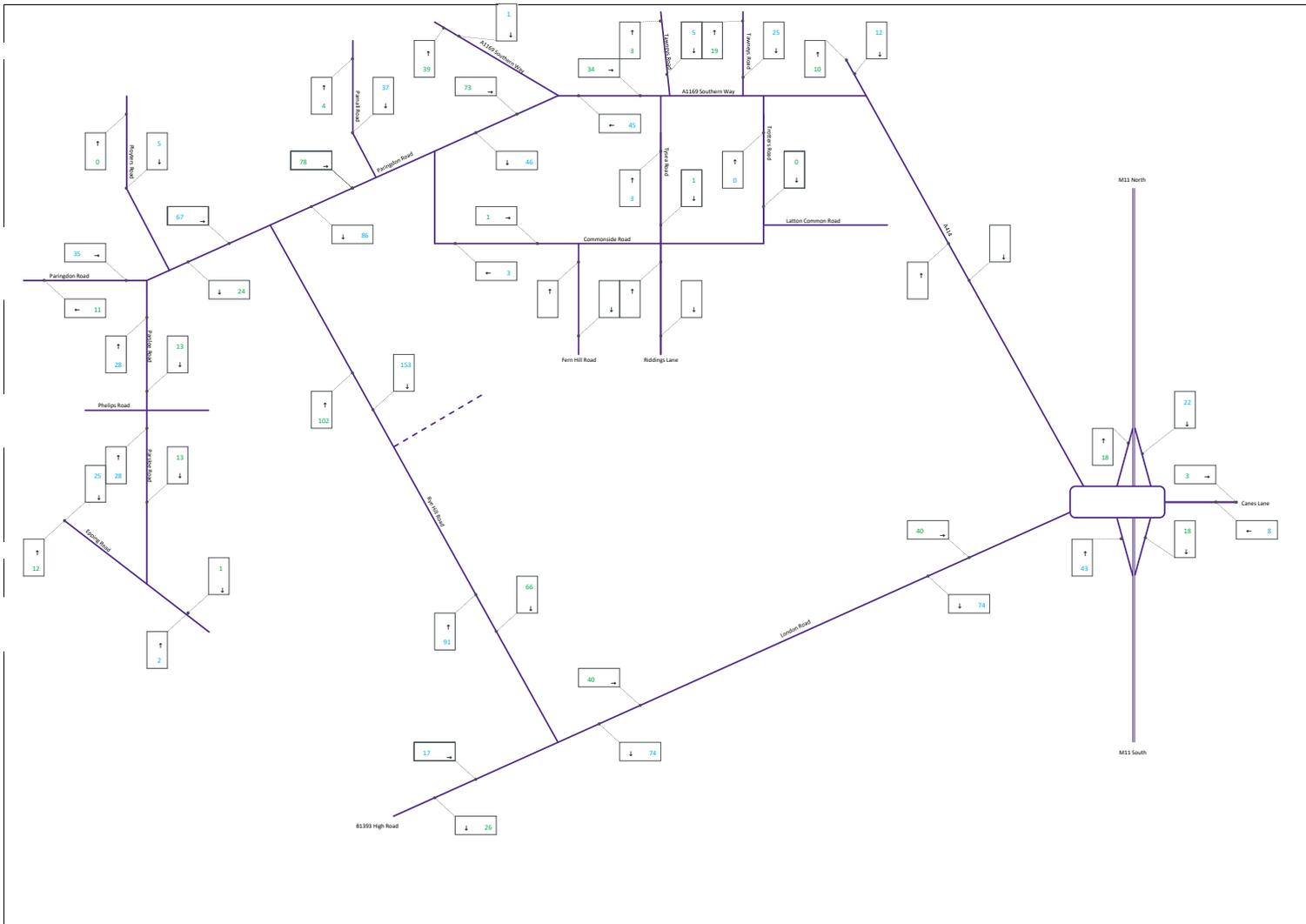
Project No.	Date	Title	Revision	Figure
4777	Jul-20	Employment Development Distribution Option 4 Western, Eastern and Northern Accesses AM Peak (08:00-09:00)	B	31
Project		Notes Based upon Census 2011 Data for Harlow 011 M50A	Prepared By	
Lutton Priory, Harlow			EK	
Client		Checked By		
Epping Forest District Council		Arrivals Departures		



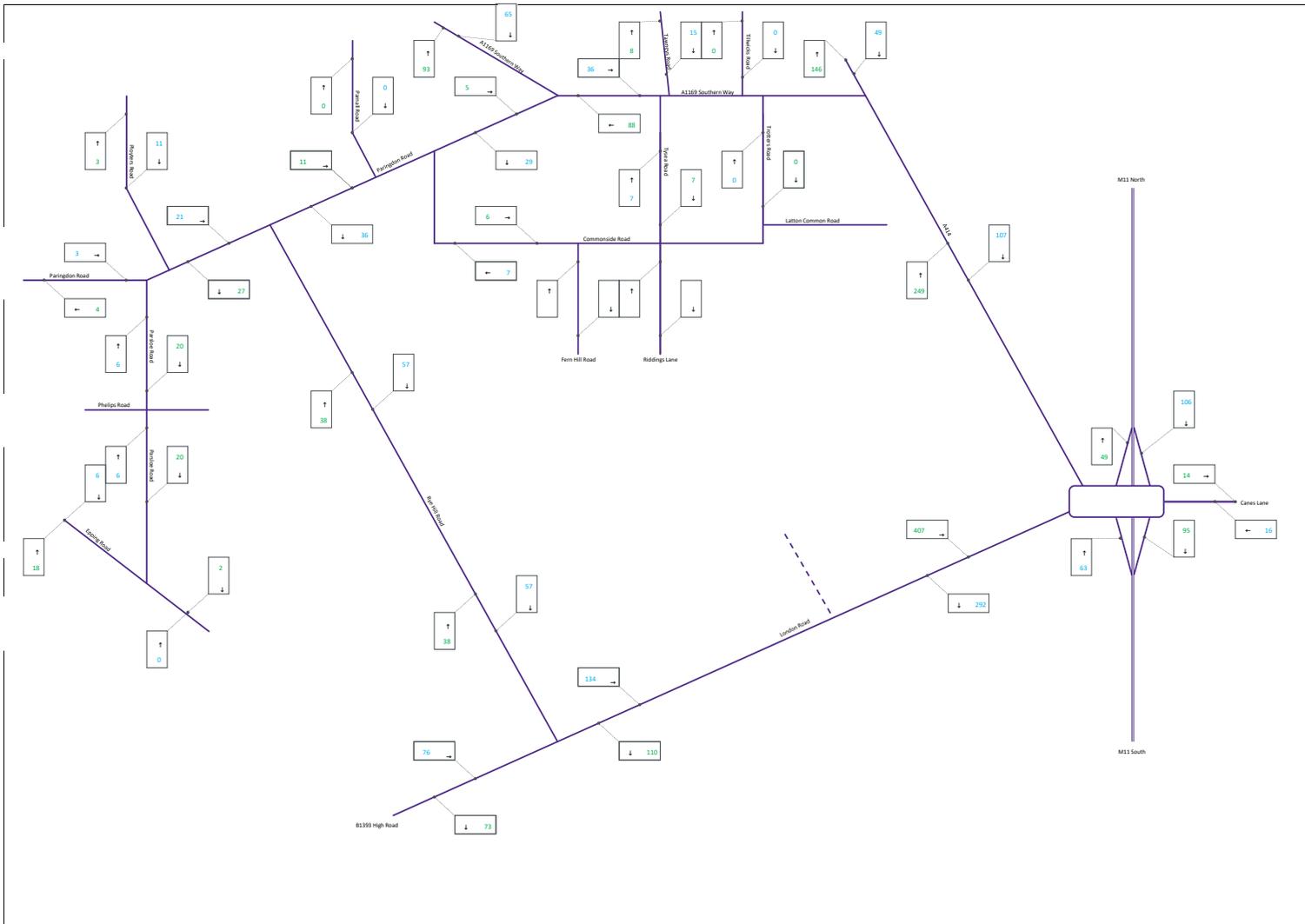
Project No.	Date	Title	Revision	Figure
4777	Jul-20	Development Assignment Northern Access Points AM Peak (08:00-09:00)	B	33
Project		Notes	Prepared By	
Lutton Priory, Harlow			EK	
Client		Checked By		
Epping Forest District Council		Arrivals Departures		



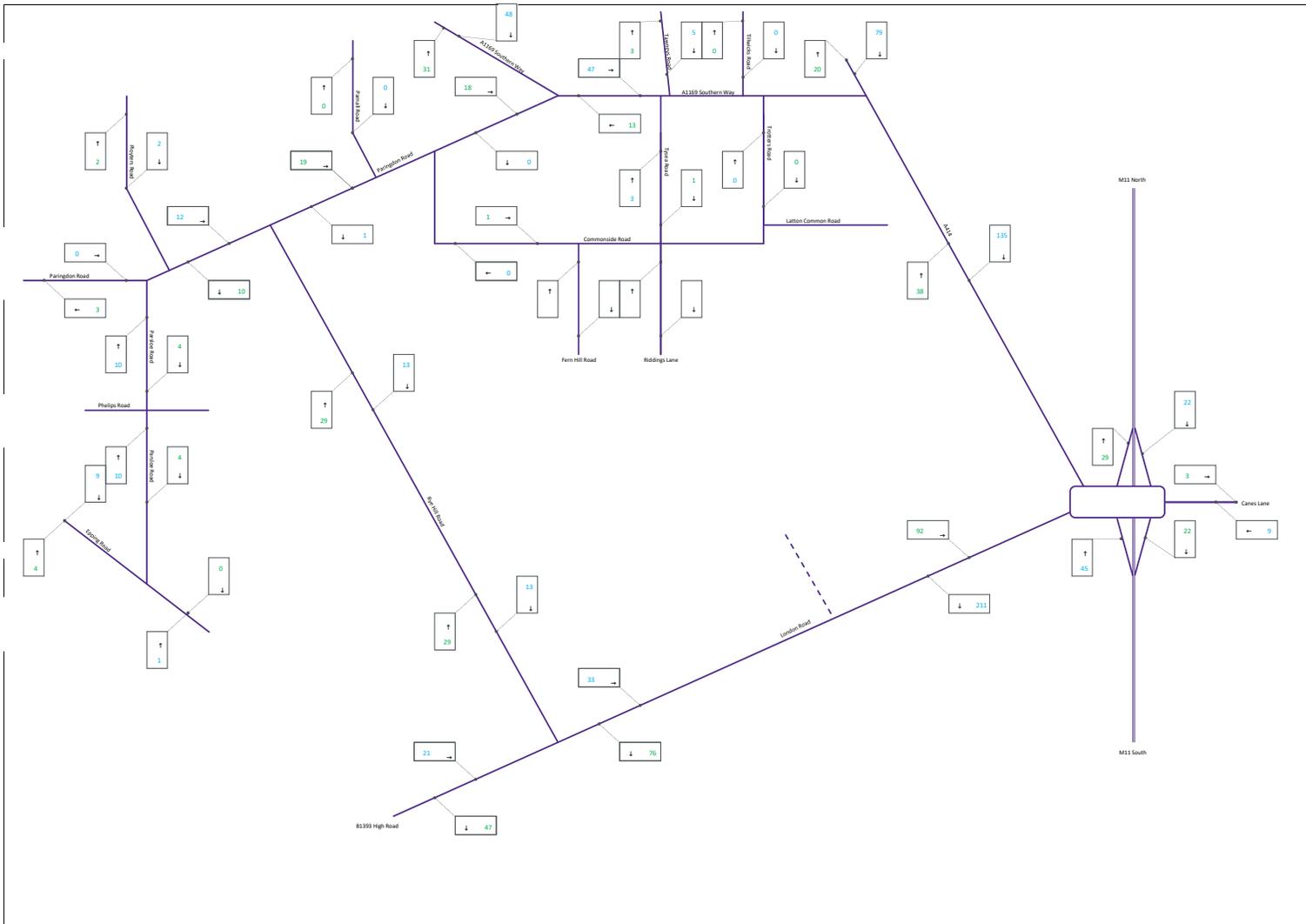
Project No.	Date	Title	Revision	Figure
4777	Jul-20	Development Assignment Northern Access Points AM Peak (08:00-09:00)	B	34
Project Luton Priory, Harlow			Prepared By EK	
Client Epping Forest District Council		Notes Based upon Census 2011 data for Harlow 011 MSOA	Checked By	
		Arrivals Departures		



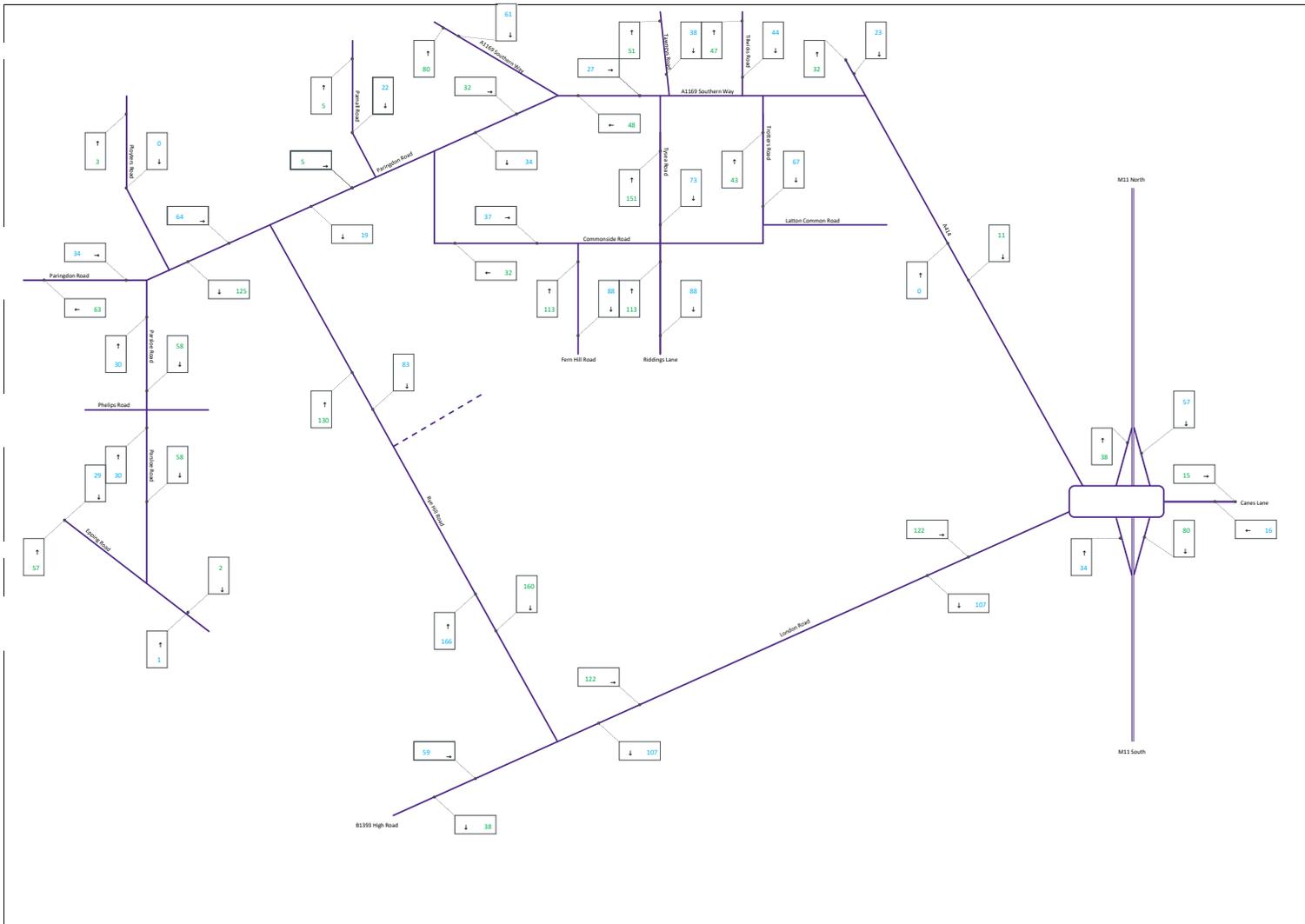
Project No.	Date	Title	Revision	Figure
4777	Jul-20	Development Assignment Western Access Point PM Peak (17:00-18:00)	B	36
Project		Notes	Prepared By	
Luton Priory, Harlow			EK	
Client		Checked By		
Epping Forest District Council		Based upon Census 2011 data for Harlow 011 MSOA Arrivals Departures		



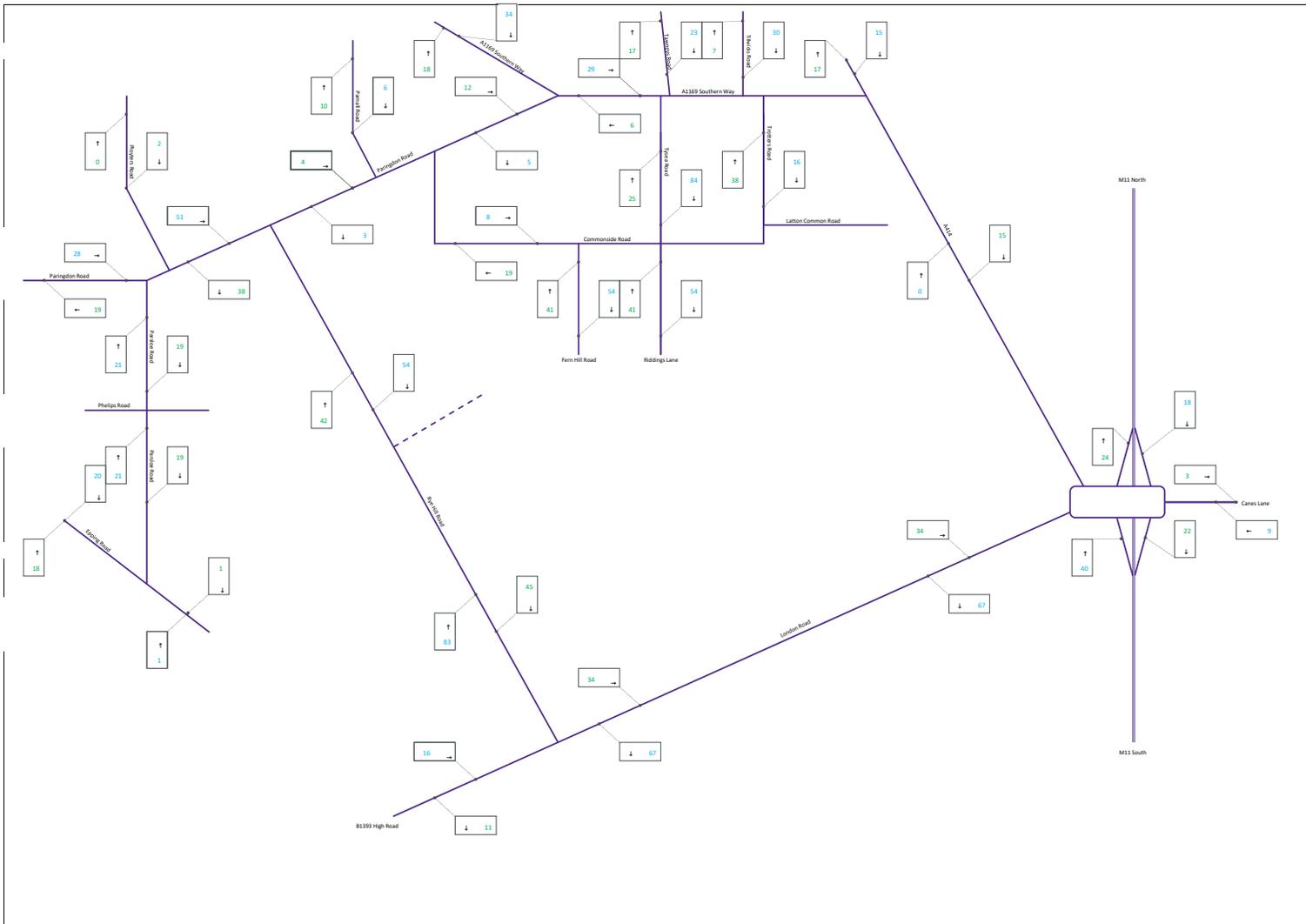
Project No.	Date	Title	Revision	Figure
4777	Jul-20	Development Assignment Eastern Access Point AM Peak (08:00-09:00)	B	37
Project		Notes Based upon Census 2011 Data for Harlow 011 MSOA	Prepared By	
Client			Checked By	
Epping Forest District Council		Arrivals Departures		



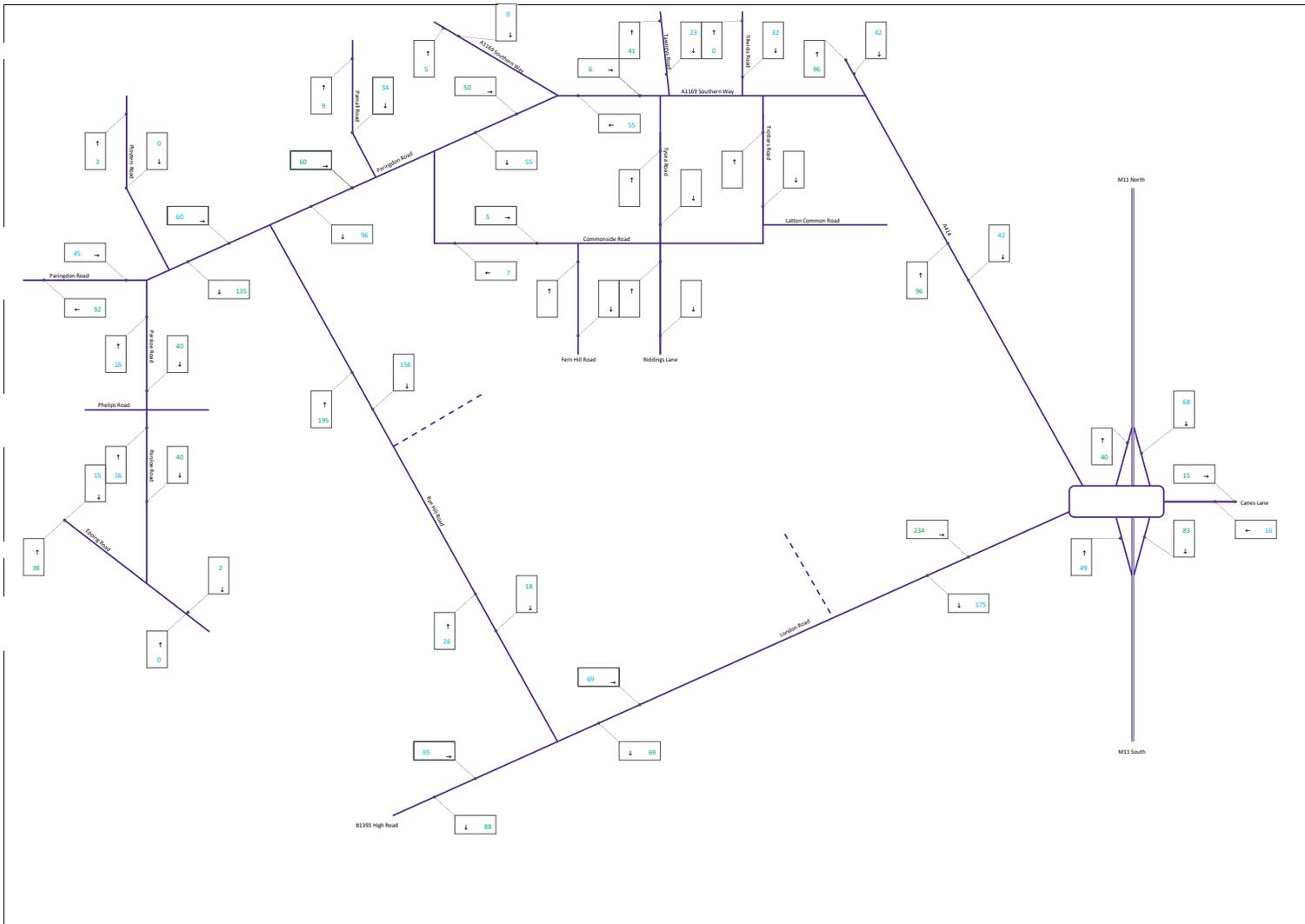
Project No.	Date	Title	Revision	Figure
4777	Jul-20	Development Assignment Eastern Access Point PM Peak (17:00-18:00)	B	38
Project			Prepared By	
Luton Priory, Harlow			EK	
Client		Checked By		
Epping Forest District Council		Notes Based upon Census 2011 data for Harlow 011 MSOA Arrivals Departures		



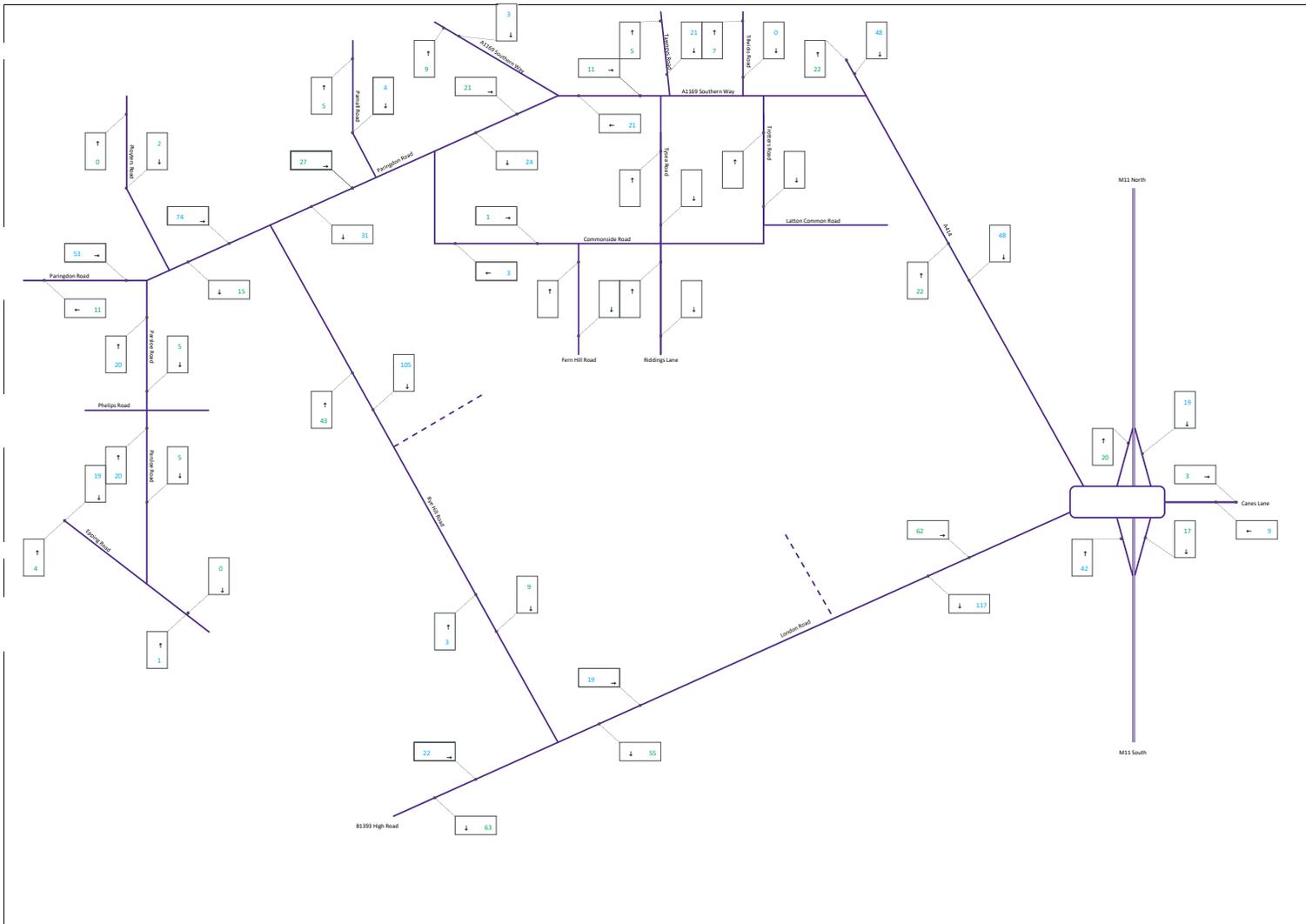
Project No.	Date	Title	Revision	Figure
4777	Jul-20	Development Assignment	B	39
Project		Access Option 2: Western and Northern Access Points	Prepared By	
Luton Priory, Harlow		AM Peak (08:00-09:00)	EK	
Client		Notes	Checked By	
Epping Forest District Council		Based upon Census 2011 Data for Harlow 011 MSOA Arrivals Departures		



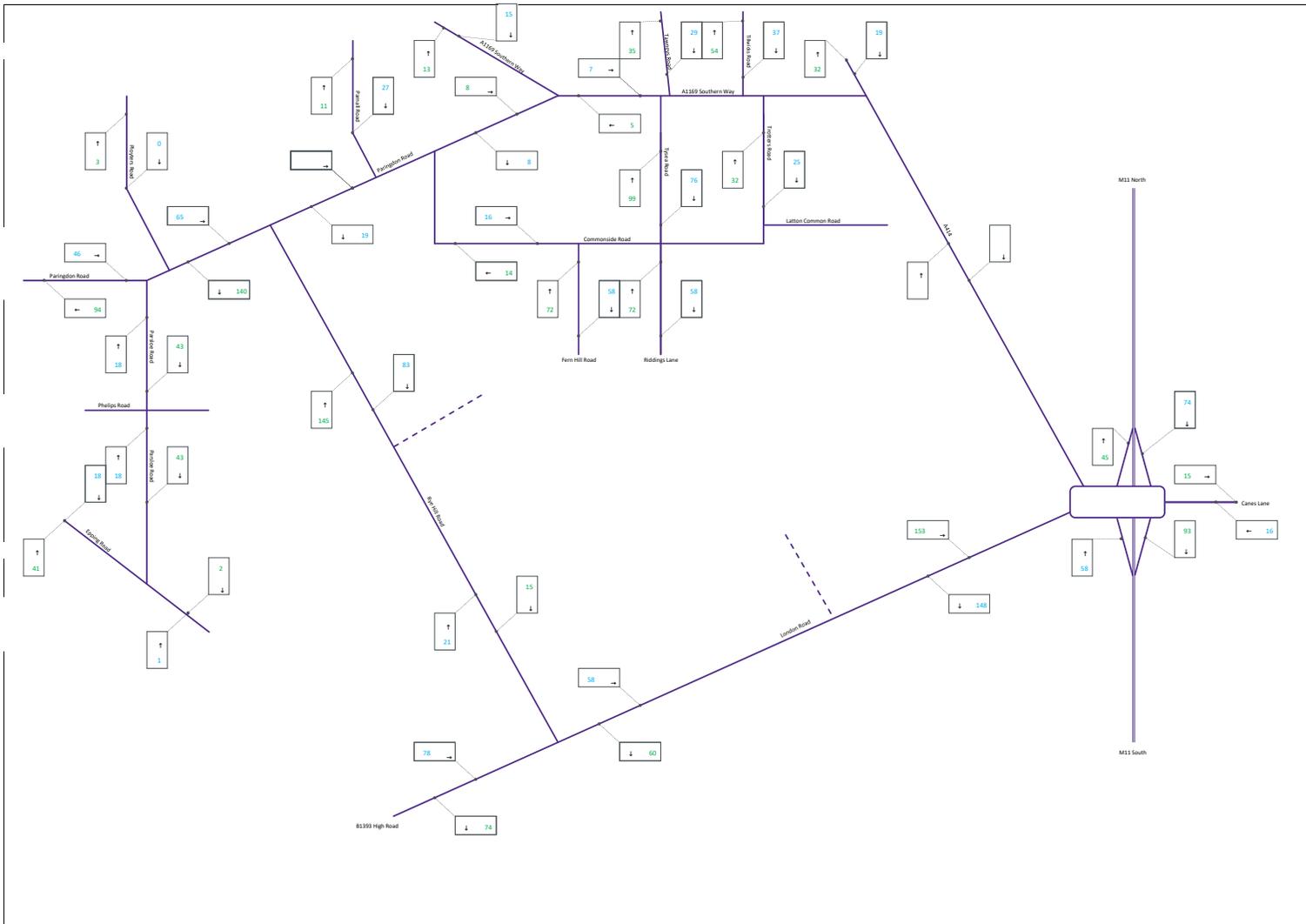
Project No.	Date	Title	Revision	Figure
4777	Jul-20	Development Assignment	B	40
Project		Access Option 2: Western and Northern Access Points	Prepared By	
Latton Priory, Harlow		PM Peak (17:00-18:00)	EK	
Client		Notes	Checked By	
Epping Forest District Council		Based upon Census 2011 Data for Harlow 011 MSOA Arrivals Departures		



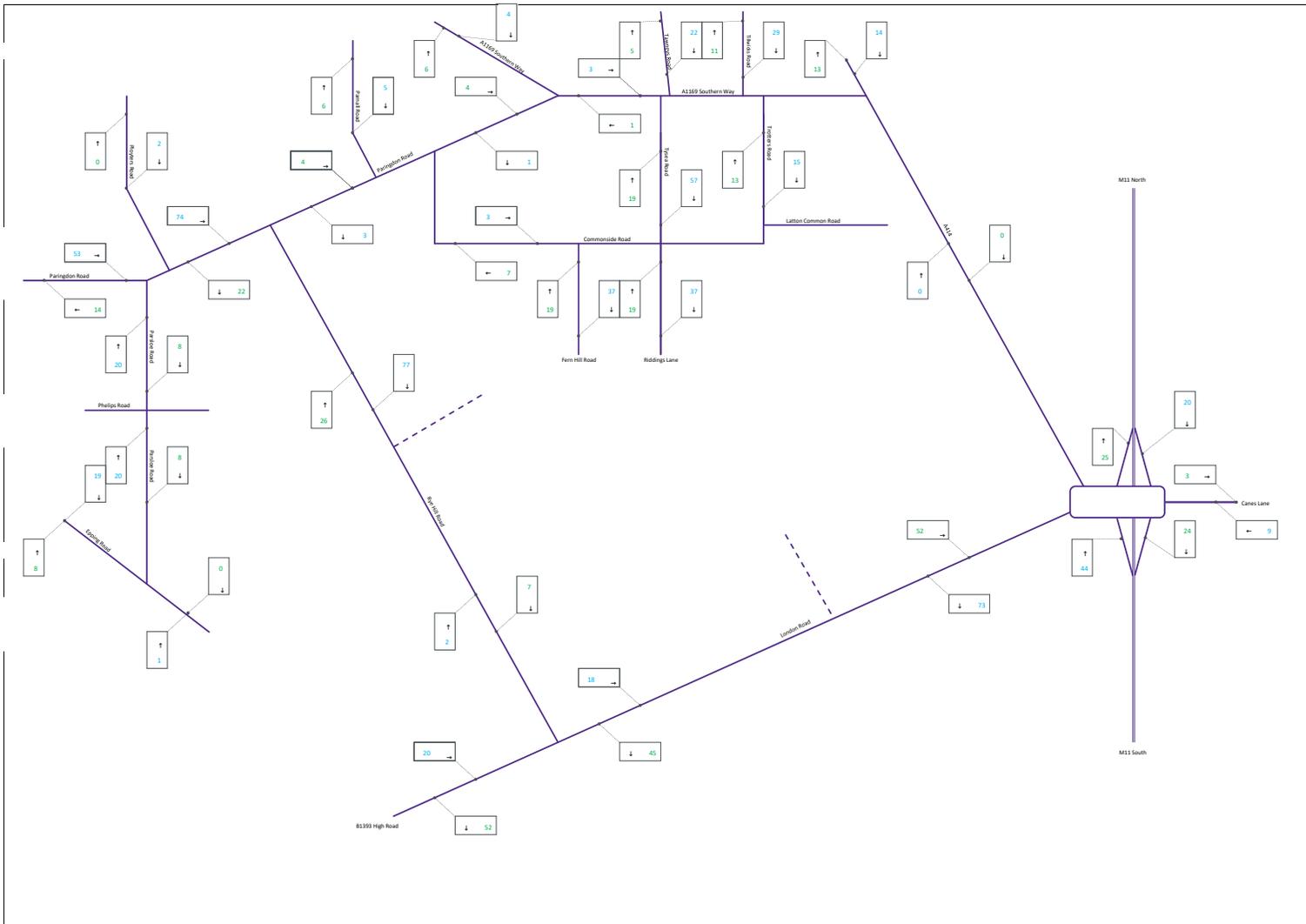
Project No.	Date	Title	Revision	Figure
4777	Jul-20	Development Assignment Option 3 Western and Eastern Accesses AM Peak (08:00-09:00)	B	41
Project			Prepared By	
Latton Priory, Harlow			EK	
Client		Checked By		
Epping Forest District Council		Notes Based upon Census 2011 Data for Harlow 011 MSOA Arrivals Departures		



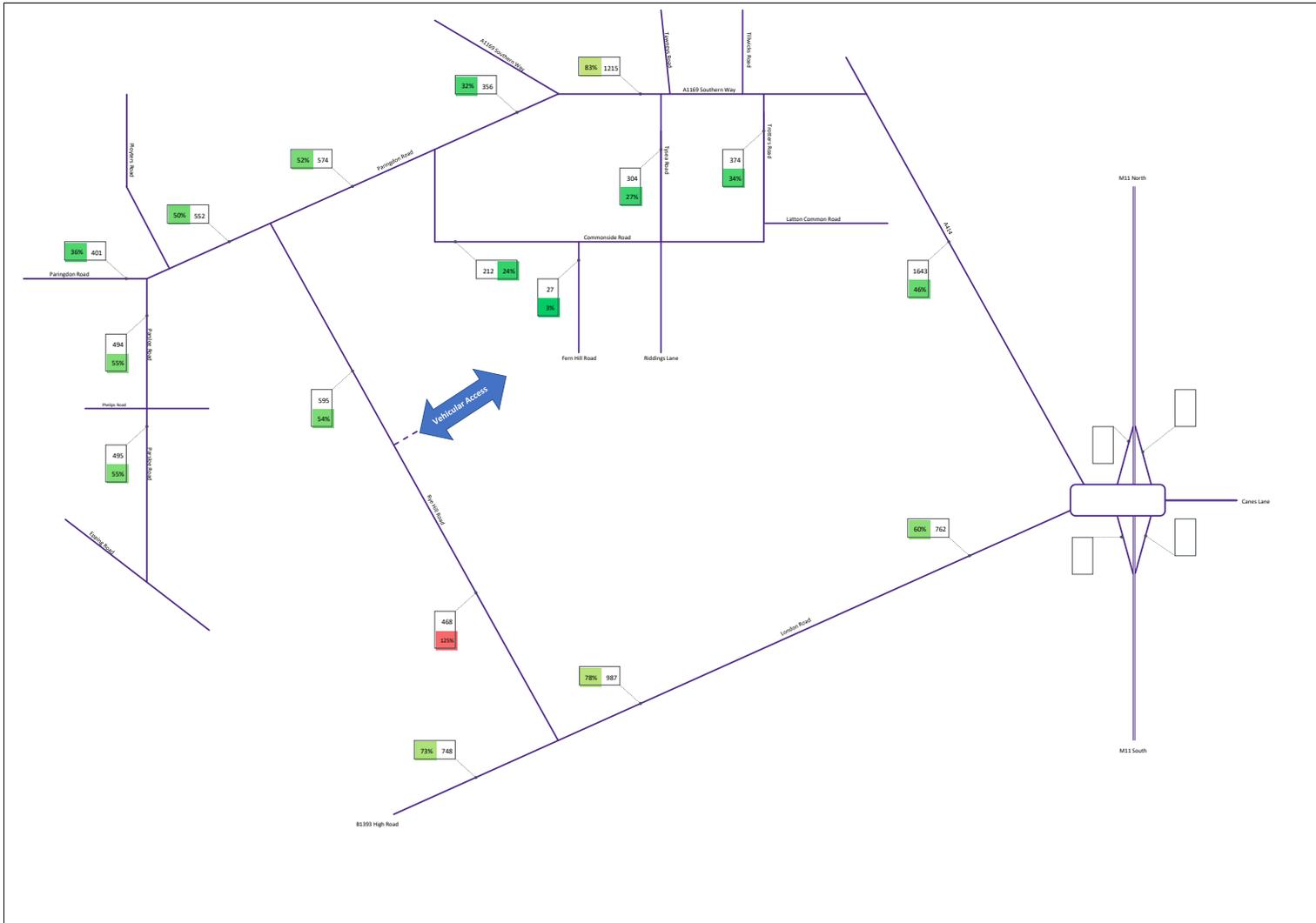
Project No.	Date	Title	Revision	Figure
4777	Jul-20	Development Assignment Option 3 Western and Eastern Accesses PM Peak (17:00-18:00)	B	42
Project			Prepared By	
Luton Priory, Harlow			EK	
Client		Checked By		
Epping Forest District Council		Notes Based upon Census 2011 Data for Harlow 011 MSOA Arrivals Departures		



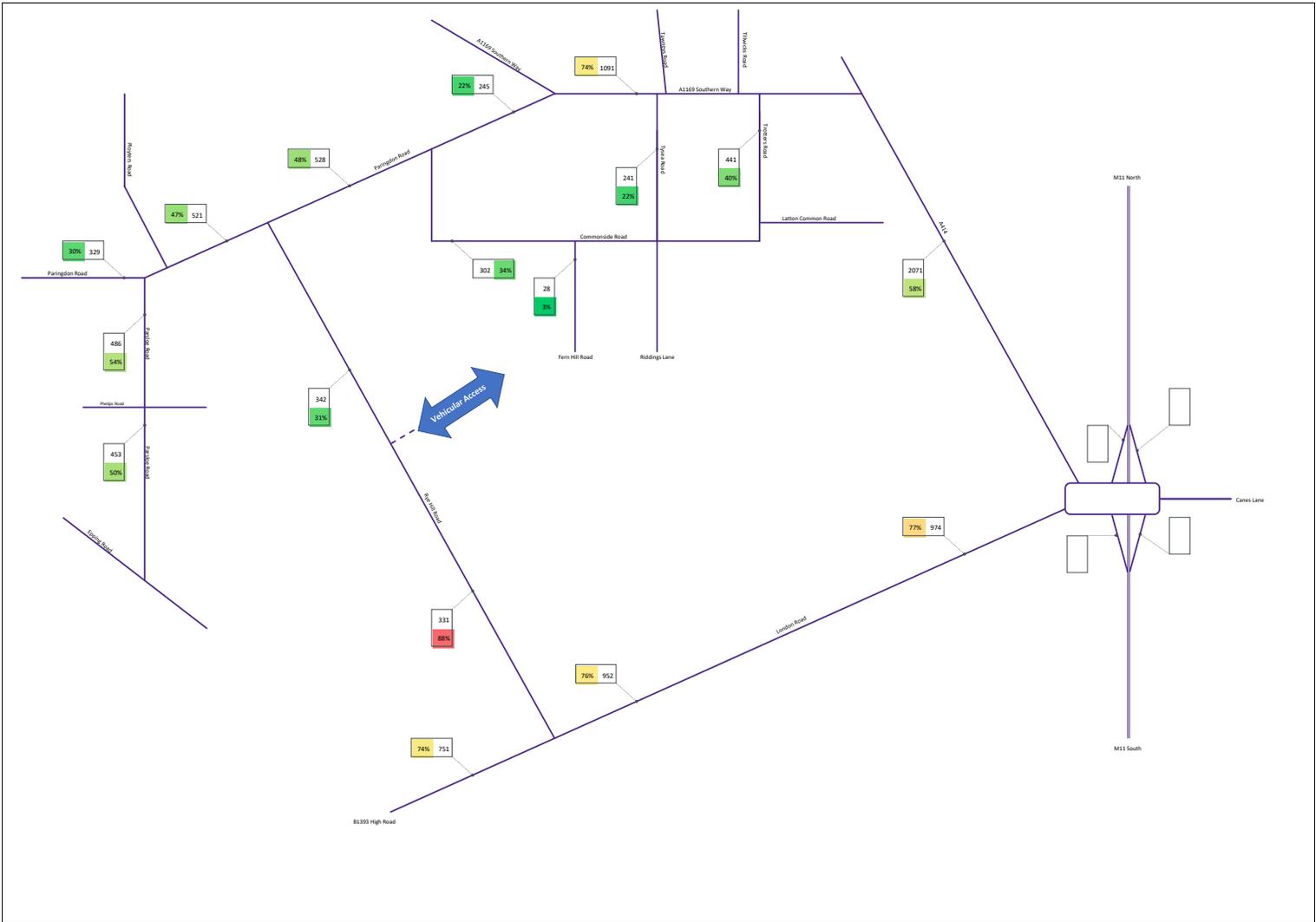
Project No.	Date	Title	Revision	Figure
4777	Jul-20	Development Assignment	B	43
Project		Option 4 Western, Eastern and Northern Accesses	Prepared By	
Luton Priory, Harlow		AM Peak (08:00-09:00)	EK	
Client		Notes	Checked By	
Epping Forest District Council		Based upon Census 2011 Data for Harlow 011 M50A Arrivals Departures		



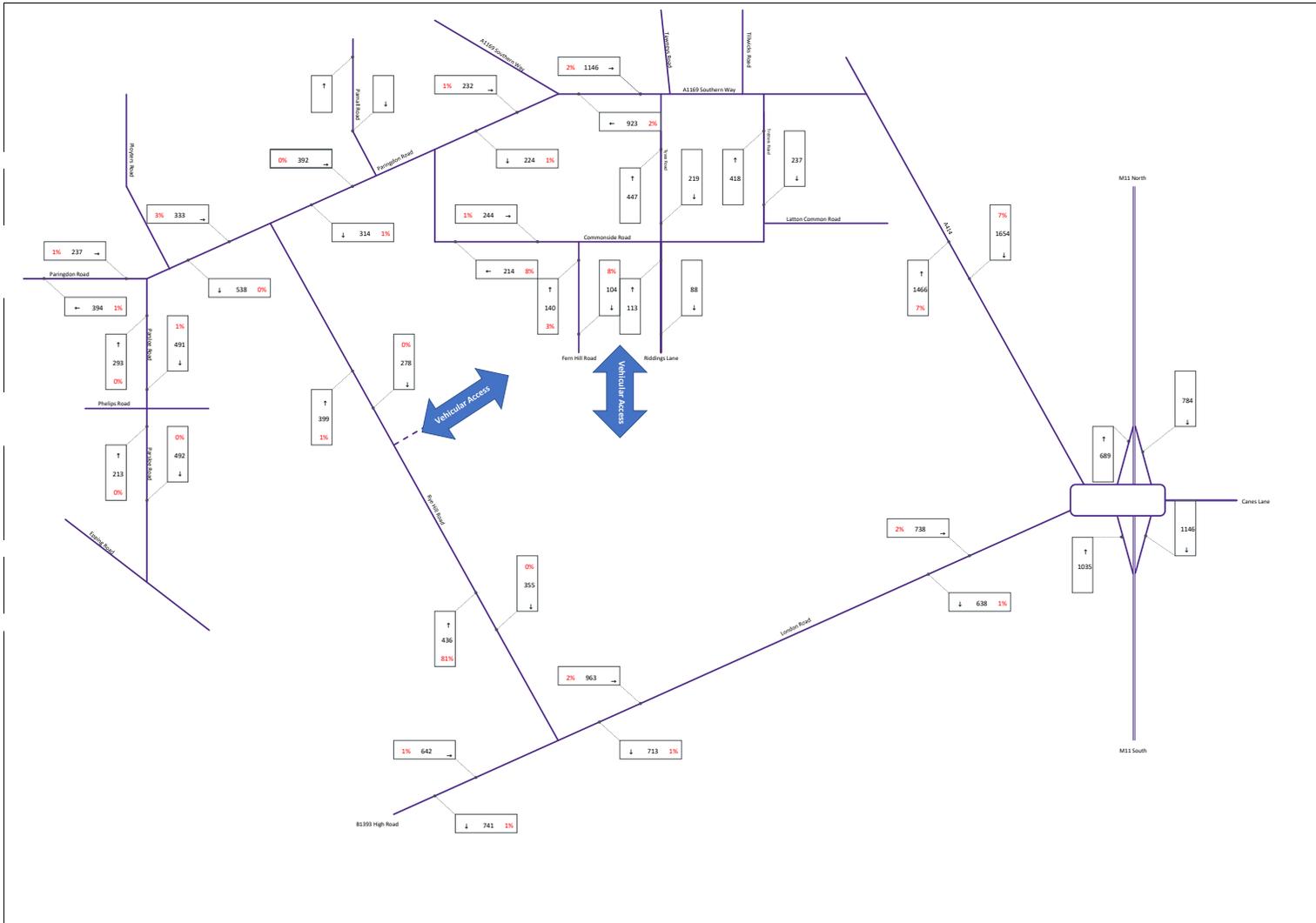
Project No.	Date	Title	Revision	Figure
4777	Jul-20	Development Assignment	B	44
Project		Option 4 Western, Eastern and Northern Accesses	Prepared By	
Luton Priory, Harlow		PM Peak (17:00-18:00)	EK	
Client		Notes	Checked By	
Epping Forest District Council		Based upon Census 2011 Data for Harlow 011 M50A Arrivals Departures		



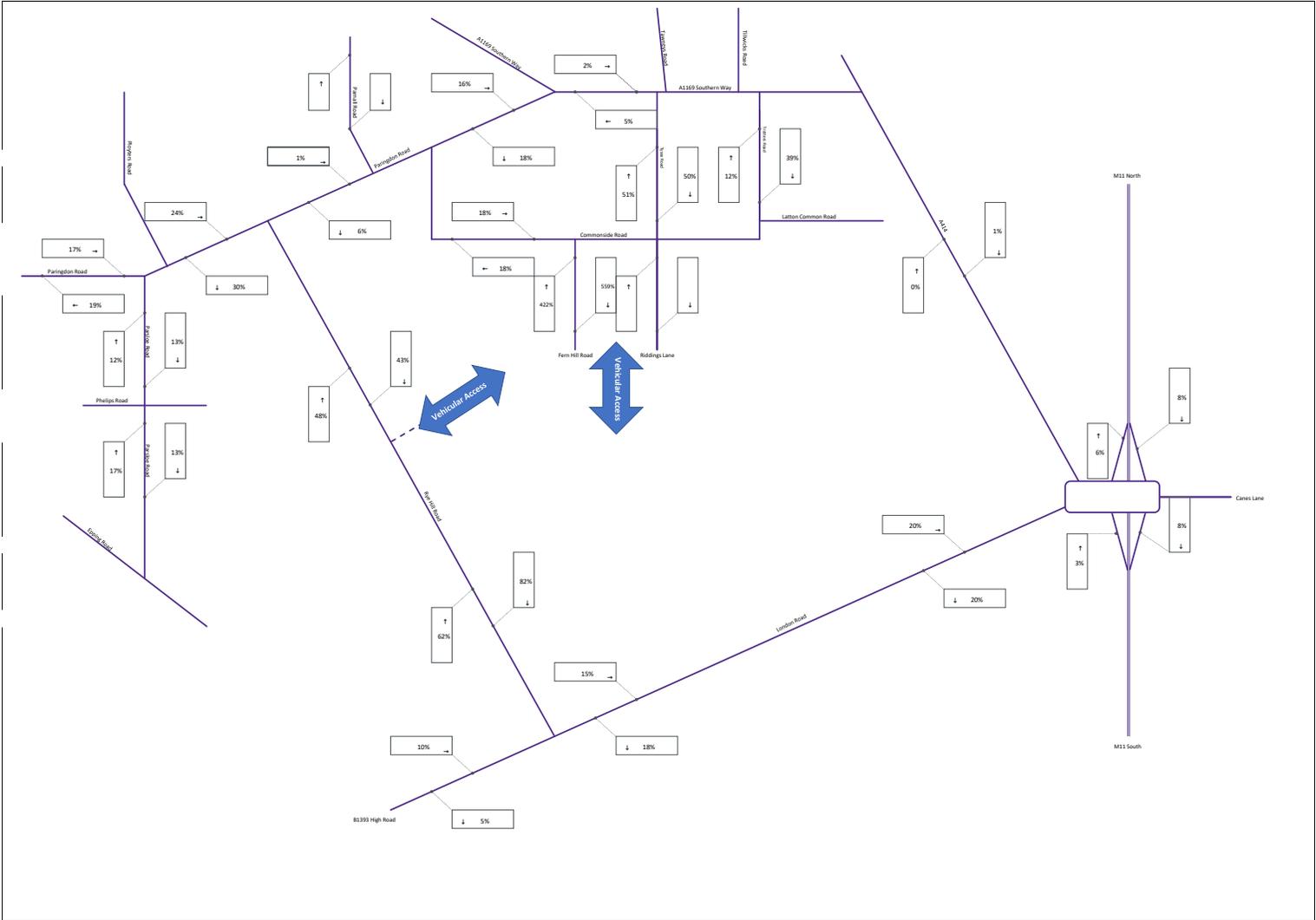
Project No.	Date	Title	Revision	Figure
4777	Jul-20	2019 AM Peak + Development Option 1 - Link Capacity Assessment (08:00-09:00)	B	47
Project		Notes	Prepared By	
Luton Priory, Harlow			EK	
Client		Checked By		
Epping Forest District Council		Flows equal the highest directional flow during the peak hour. Percentages represent the percentage of link capacity based upon TA 79/99 capacity guidance.		



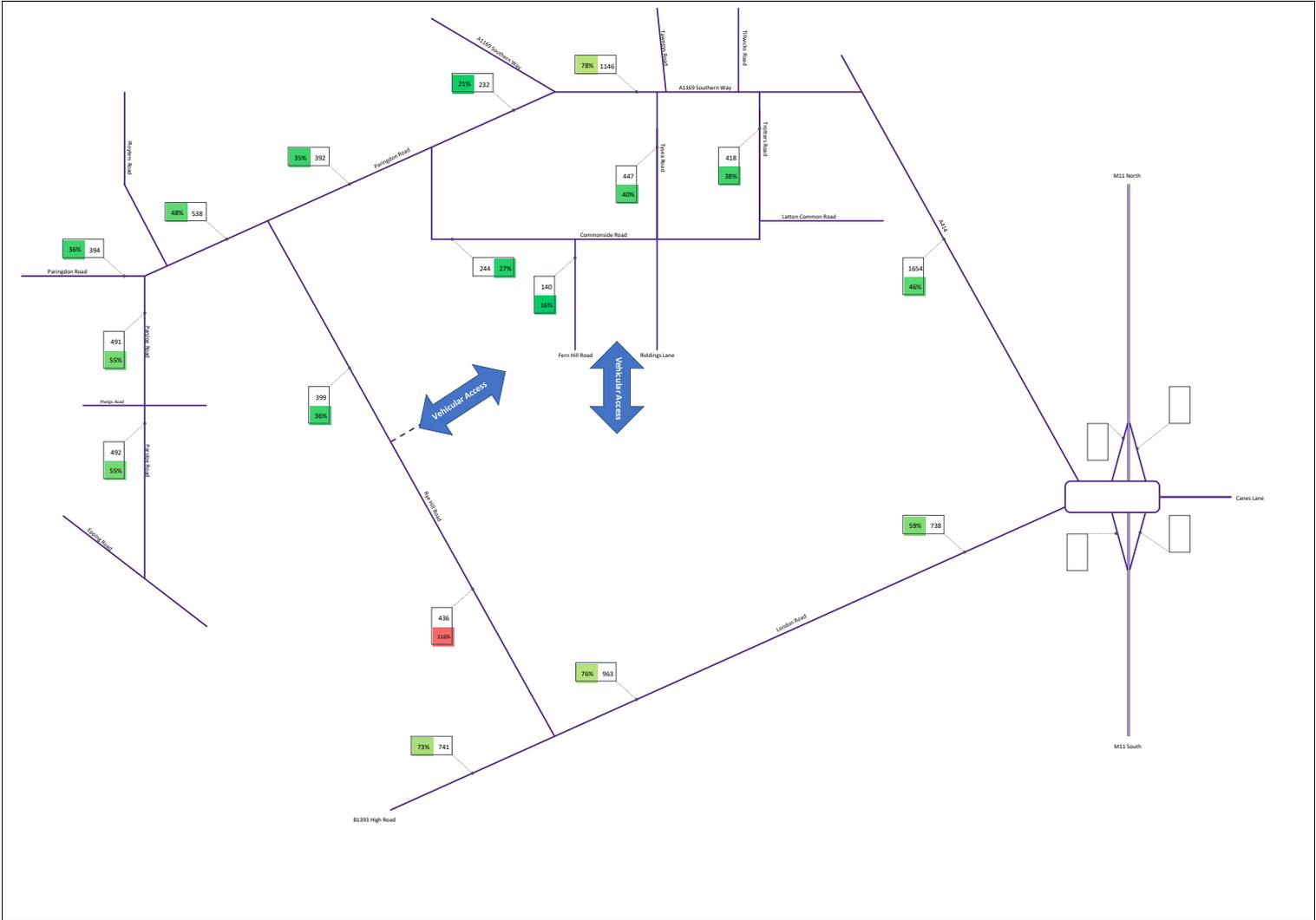
Project No.	Date	Title	Revision	Figure
4777	Jul-20	2019 PM Peak + Development Option 1 - Link Capacity Assessment (17:00-18:00)	B	50
Project		Notes	Prepared By	
Luton Priority, Harlow			EK	
Client		Checked By		
Epping Forest District Council		Flows equal the highest directional flow during the peak hour. Percentages represent the percentage of link capacity based upon TA 79/99 capacity guidance.		



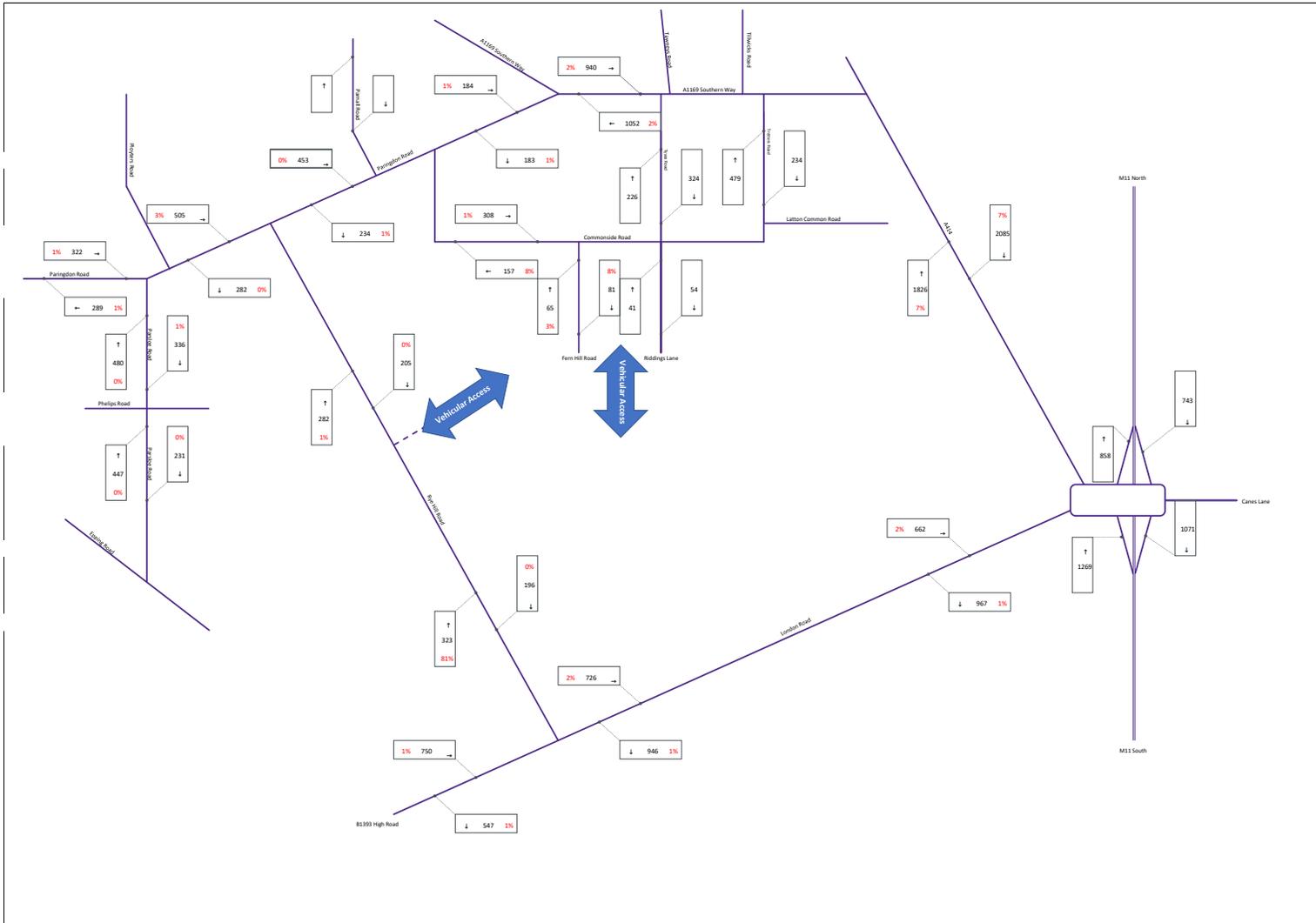
Project No.	Date	Title	Revision	Figure
4777	Jul-20	2019 AM Peak Base + Development	B	S1
Project		Option 2 - Western & Northern Accesses (08:00-09:00)	Prepared By	
Luton Priory, Harlow			EK	
Client		Notes	Checked By	
Epping Forest District Council		Figures in Black = Total vehicle flow Figures in Red = HDV %		



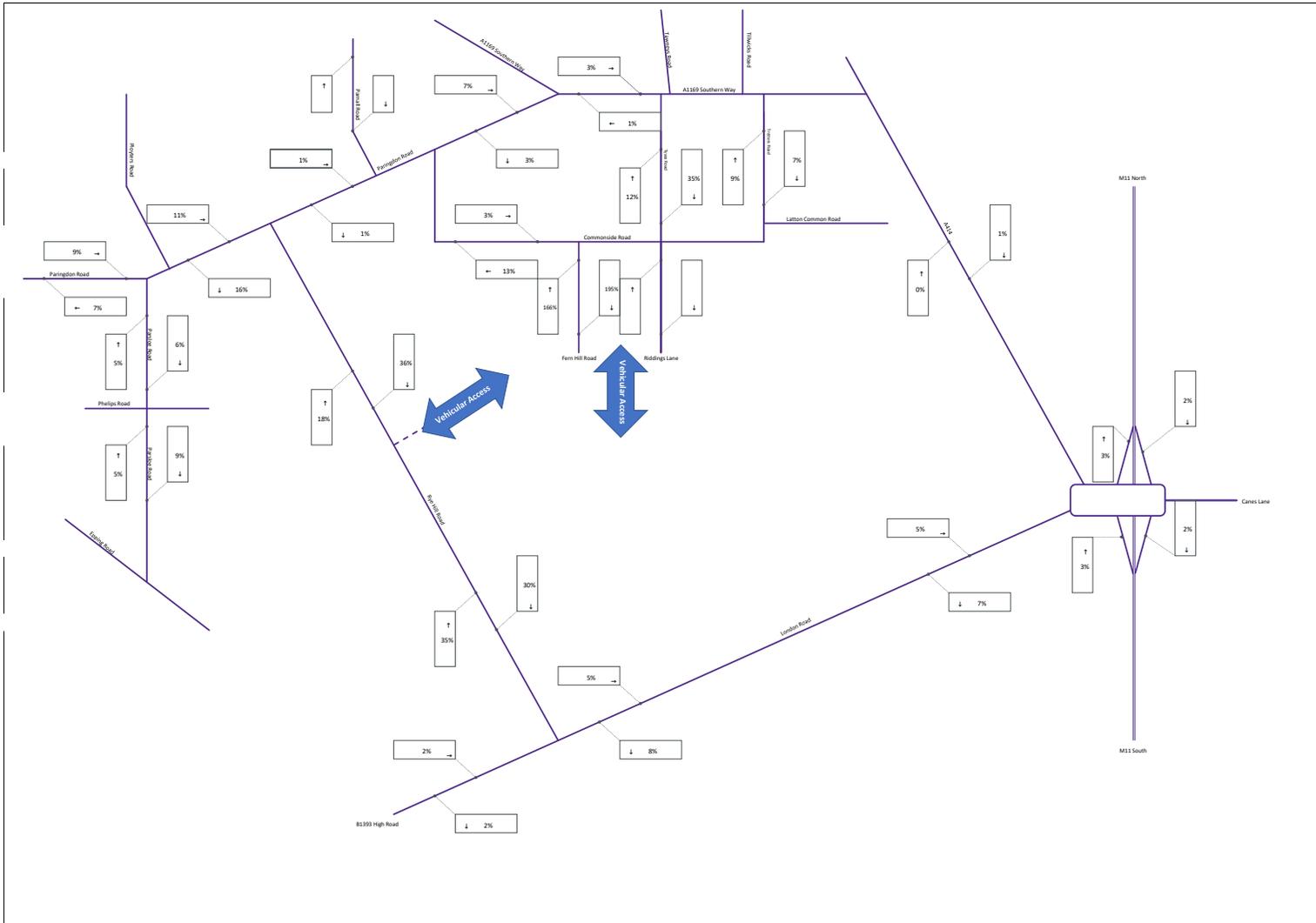
Project No.	Date	Title	Revision	Figure
4777	Jul-20	2019 AM Peak Base + Development	B	52
Project		Option 2 - Western & Northern Accesses Percentage Change (08:00-09:00)	Prepared By	
Client		Notes	Checked By	
Epping Forest District Council				



Project No.	Date	Title	Revision	Figure
4777	Jul-20	2019 AM Peak + Development Option 2 - Link Capacity Assessment (08:00-09:00)	B	53
Project		Notes	Prepared By	
Letton Priory, Harlow			EK	
Client		Checked By		
Epping Forest District Council		Flows equal the highest directional flow during the peak hour. Percentages represent the percentage of link capacity based upon TA 79/99 capacity guidance.		



Project No.	Date	Title	Revision	Figure
4777	Jul-20	2019 PM Peak Base + Development	B	S4
Project		Option 2 - Western & Northern Accesses (17:00-18:00)	Prepared By	
Luton Priority, Harlow			EK	
Client		Notes	Checked By	
Epping Forest District Council		Figures in Black = Total vehicle flow Figures in Red = HGV %		



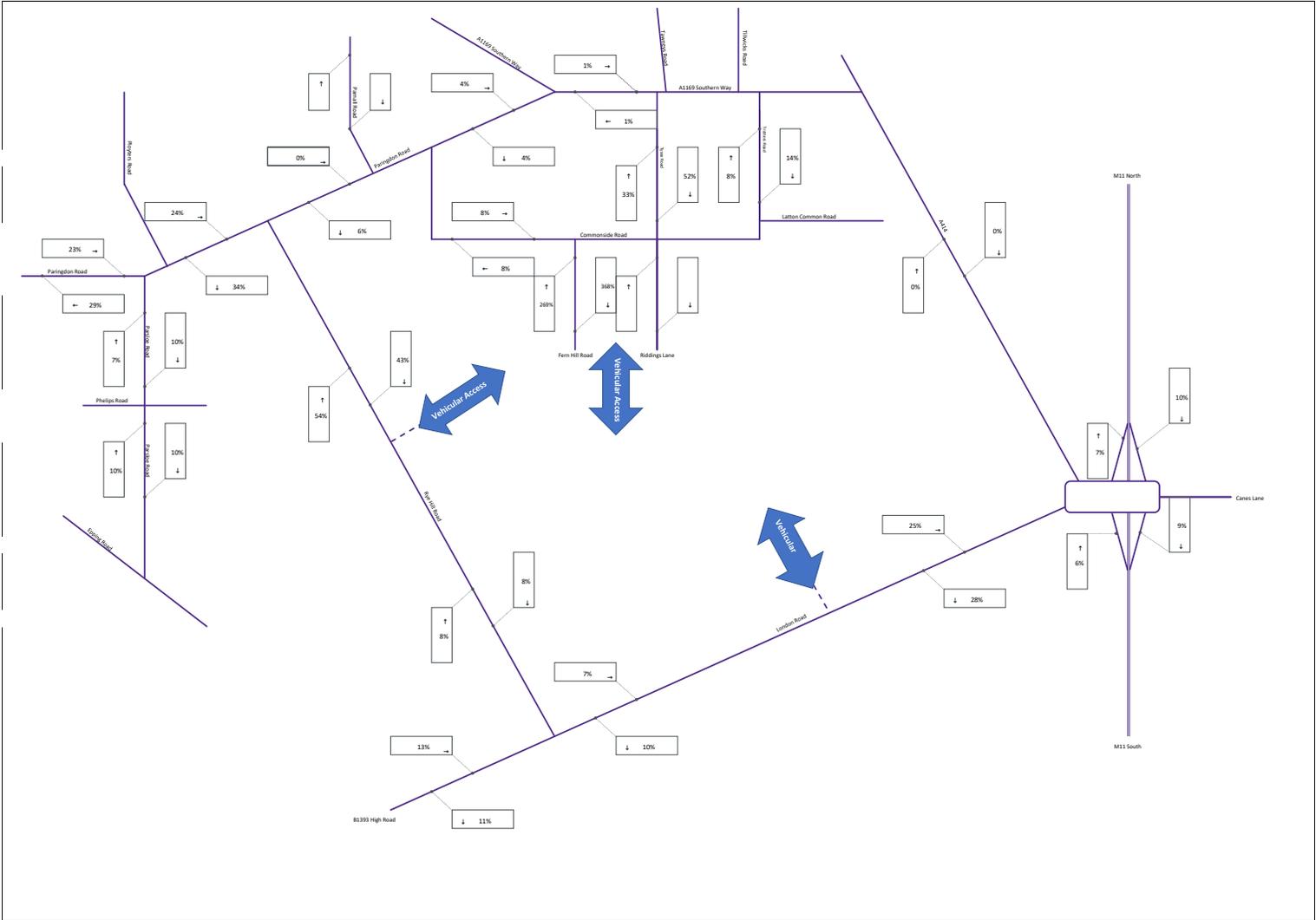
Project No.	Date	Title	Revision	Figure
4777	Jul-20	2019 PM Peak Base + Development	B	55
Project		Option 2 - Western & Northern Accesses Percentage Change (17:00-18:00)	Prepared By	
Client		Notes	Checked By	
Epping Forest District Council				



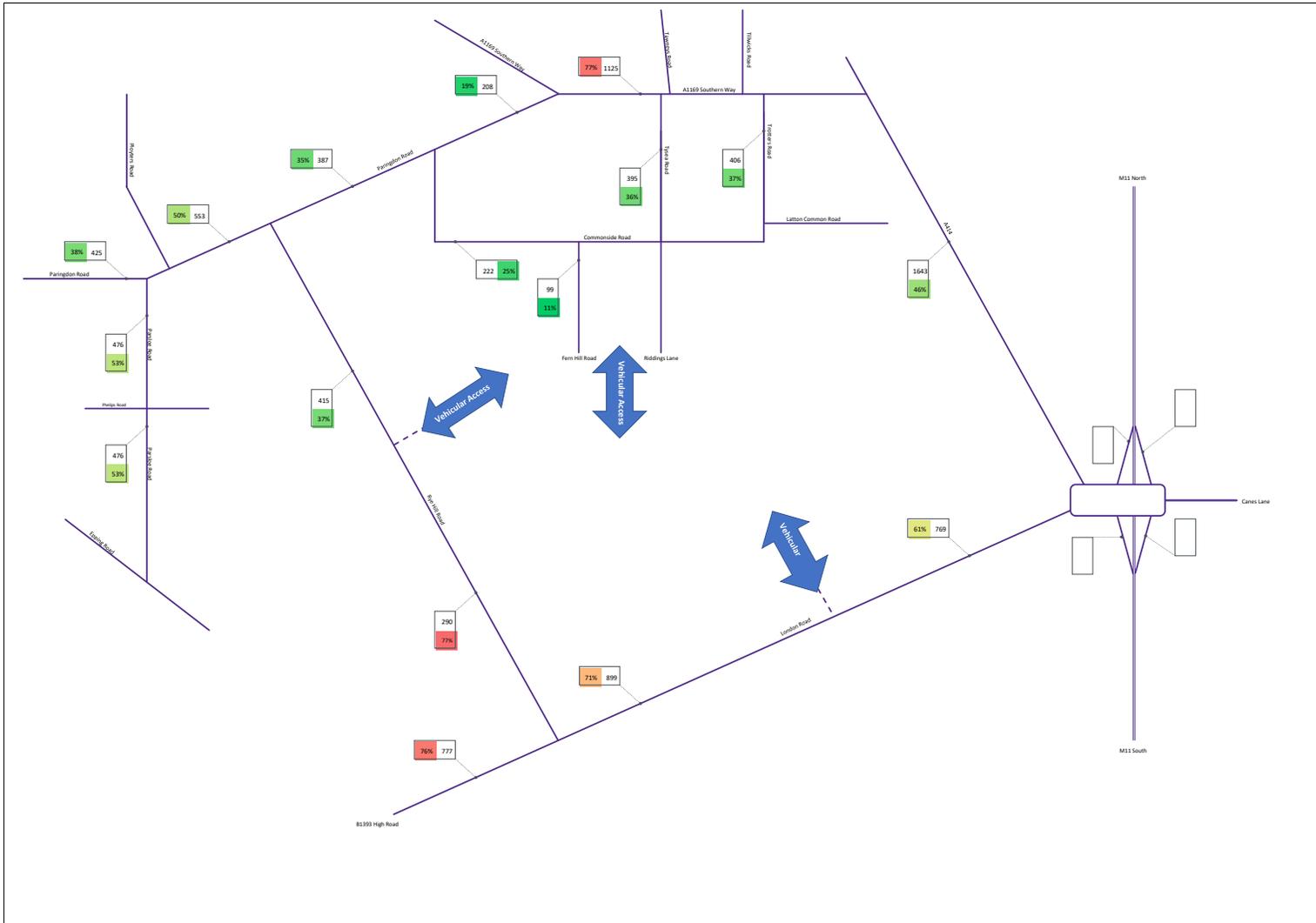
Project No.	Date	Title	Revision	Figure
4777	Jul-20	2019 AM Peak Base + Development Option 3 - Western & Eastern Accesses (08:00-09:00)	B	57
Project			Prepared By	
Lutton Priory, Harlow			EK	
Client		Checked By		
Epping Forest District Council		Notes		
		Figures in Black = Total vehicle flow Figures in Red = HDV %		



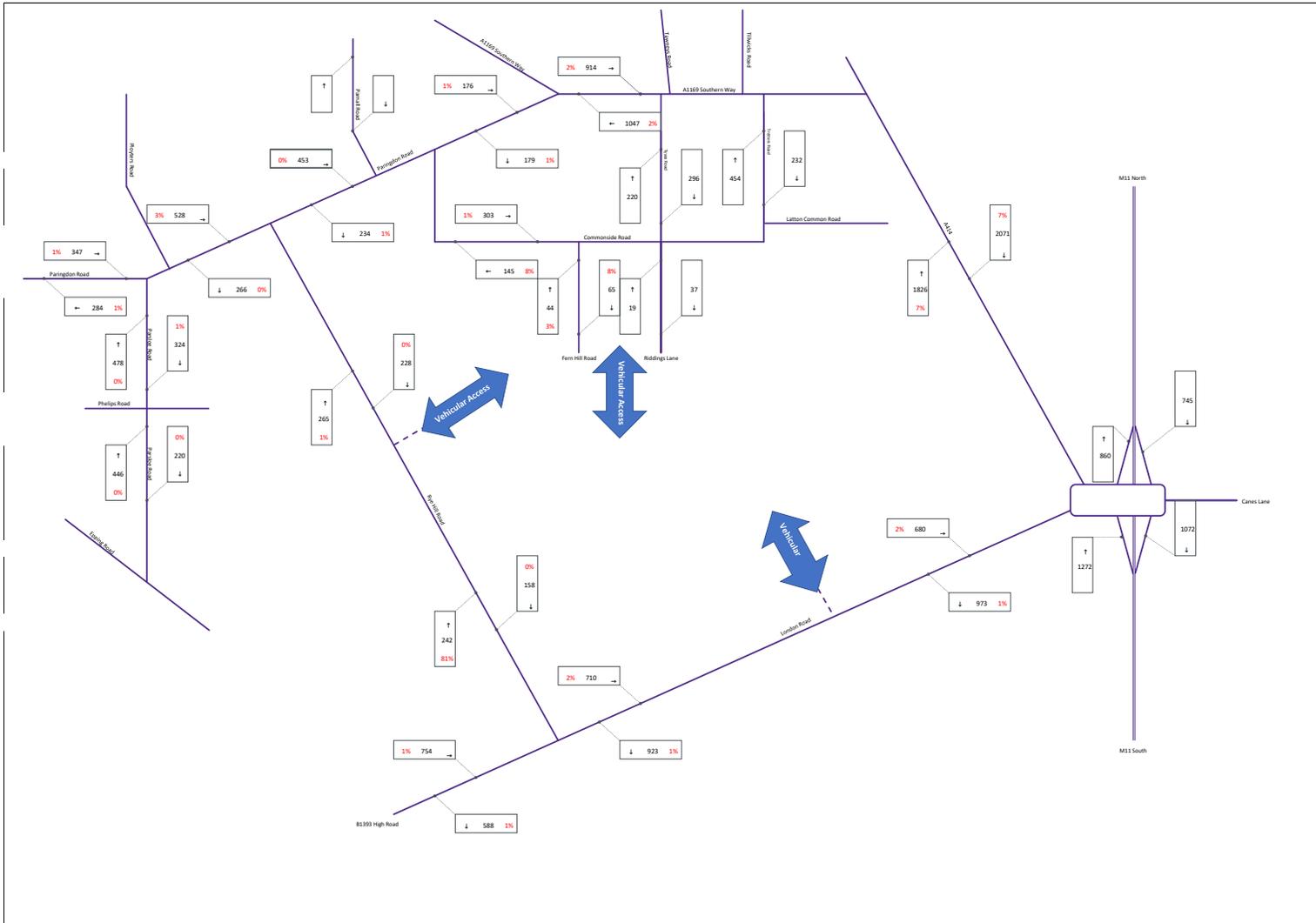
Project No.	Date	Title	Revision	Figure
4777	Jul-20	2019 AM Peak Base + Development	B	63
Project		Option 4 - Western, Northern & Eastern Accesses (08:00-09:00)	Prepared By	
Luton Priory, Harlow			EK	
Client		Notes	Checked By	
Epping Forest District Council		Figures in Black = Total vehicle flow Figures in Red = HDV %		



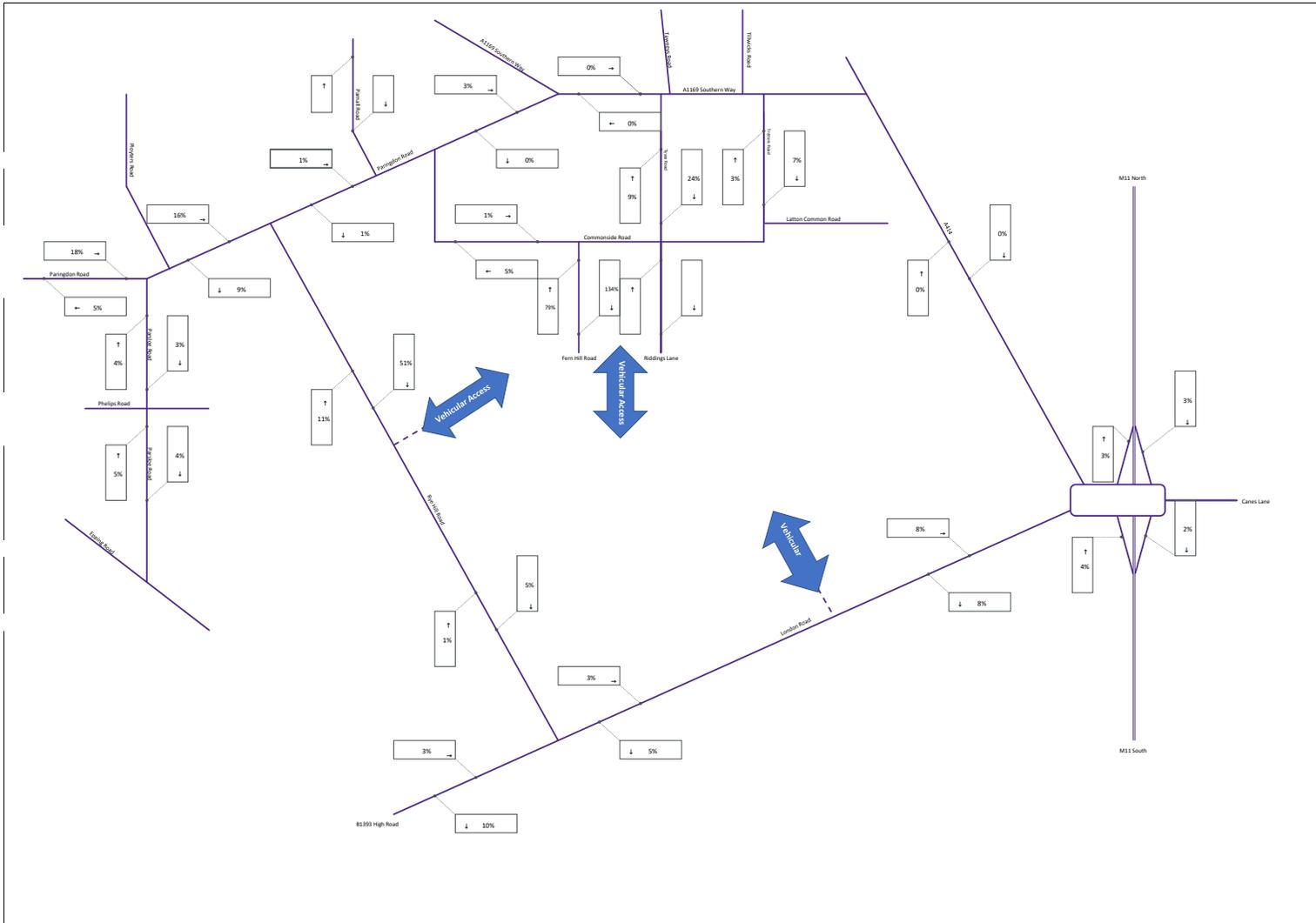
Project No.	Date	Title	Revision	Figure
4777	Jul-20	2019 AM Peak Base + Development	B	64
Project		Option 4 - Western, Northern & Eastern Accesses Percentage Change (08:00-09:00)	Prepared By	
Client		Notes	Checked By	
Epping Forest District Council				



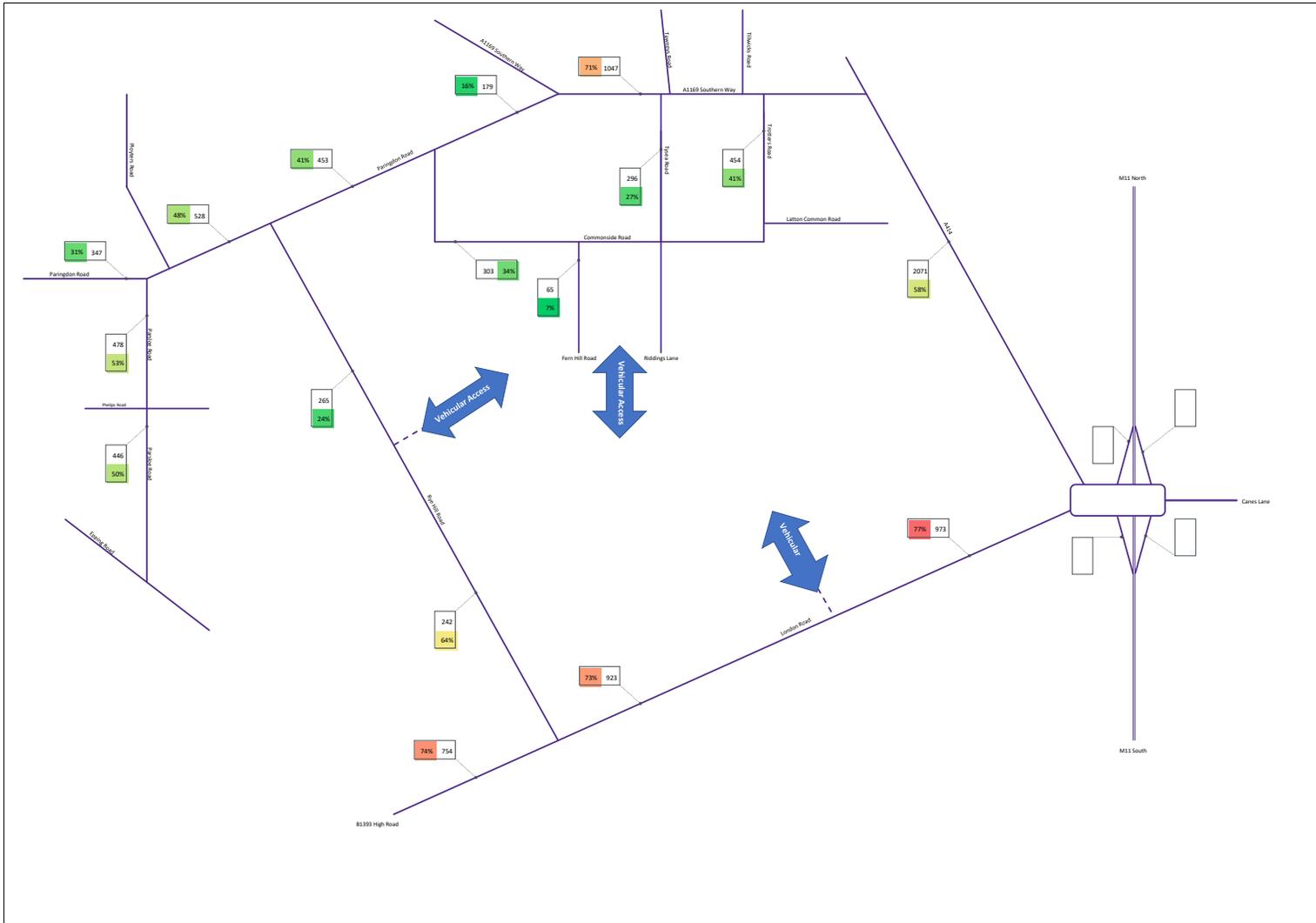
Project No.	Date	Title	Revision	Figure
4777	Jul-20	2019 AM Peak + Development Option 4 - Link Capacity Assessment (08:00-09:00)	B	65
Project			Prepared By	
Latton Priory, Harlow			EK	
Client		Checked By		
Epping Forest District Council		Notes		
		Flows equal the highest directional flow during the peak hour. Percentages represent the percentage of link capacity based upon TA 79/99 capacity guidance.		



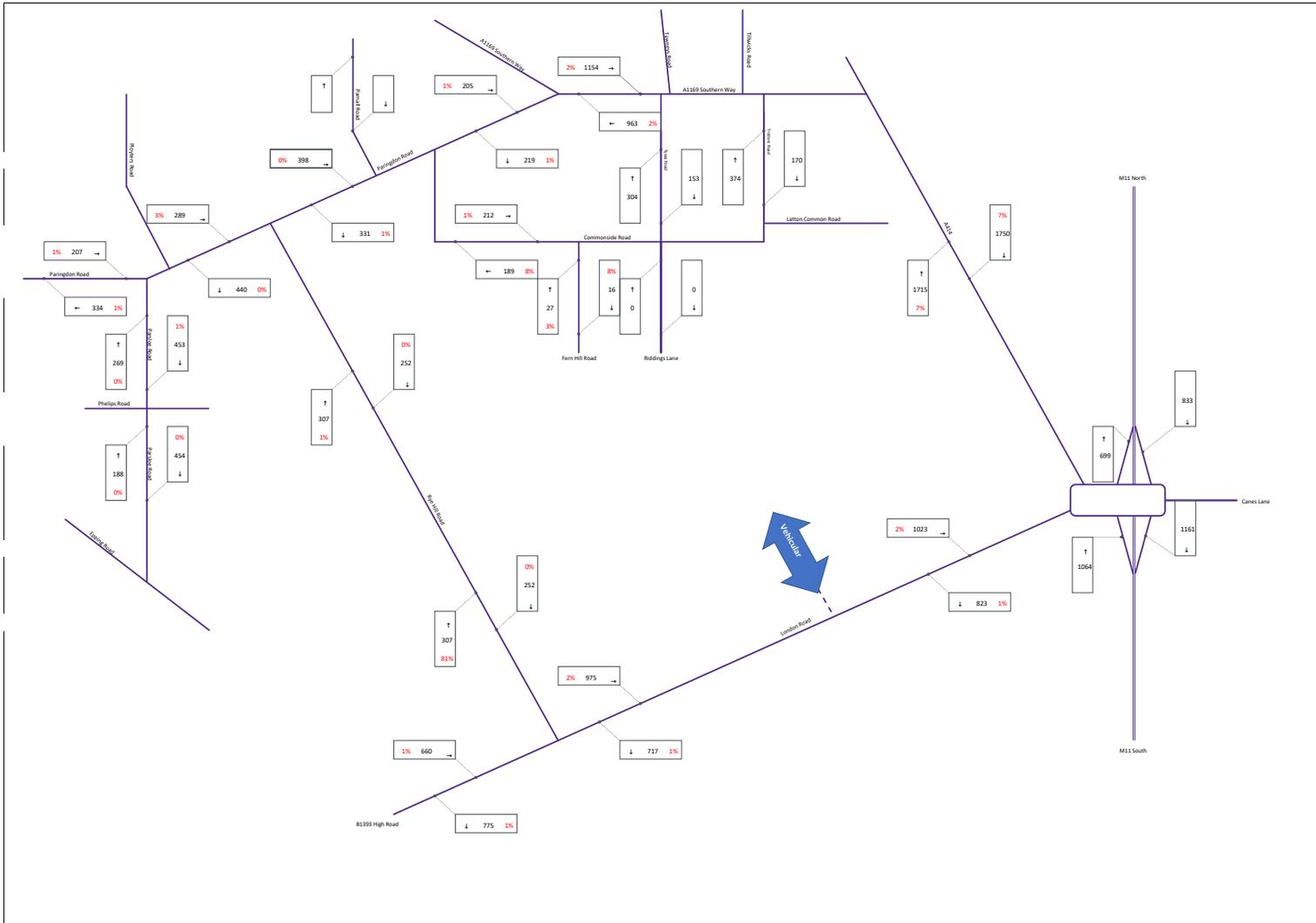
Project No.	Date	Title	Revision	Figure
4777	Jul-20	2019 PM Peak Base + Development	B	66
Project		Option 4 - Western, Northern & Eastern Accesses (17:00-18:00)	Prepared By	
Client		Epping Forest District Council	Checked By	
Notes		Figures in Black = Total vehicle flow Figures in Red = HDV %		



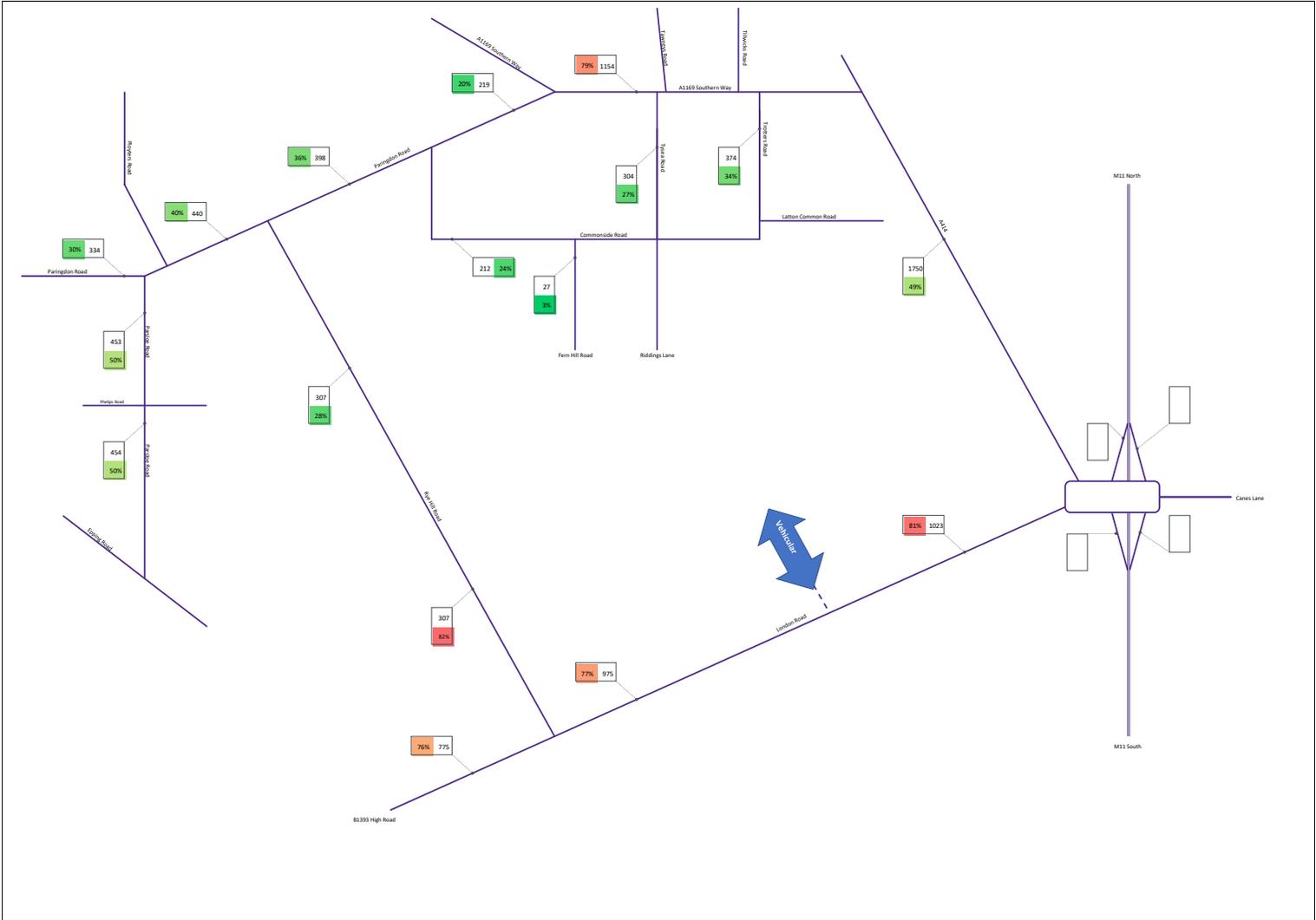
Project No.	Date	Title	Revision	Figure
4777	Jul-20	2019 PM Peak Base + Development	B	67
Project		Option 4 - Western, Northern & Eastern Accesses Percentage Change (17:00-18:00)	Prepared By	
Client		Notes	Checked By	
Epping Forest District Council				



Project No.	Date	Title	Revision	Figure
4777	Jul-20	2019 AM Peak + Development Option 4 - Link Capacity Assessment (17:00-18:00)	B	68
Project			Prepared By	
Latton Priory, Harlow			EK	
Client		Checked By		
Epping Forest District Council		Notes		
		Flows equal the highest directional flow during the peak hour. Percentages represent the percentage of link capacity based upon TA 79/99 capacity guidance.		



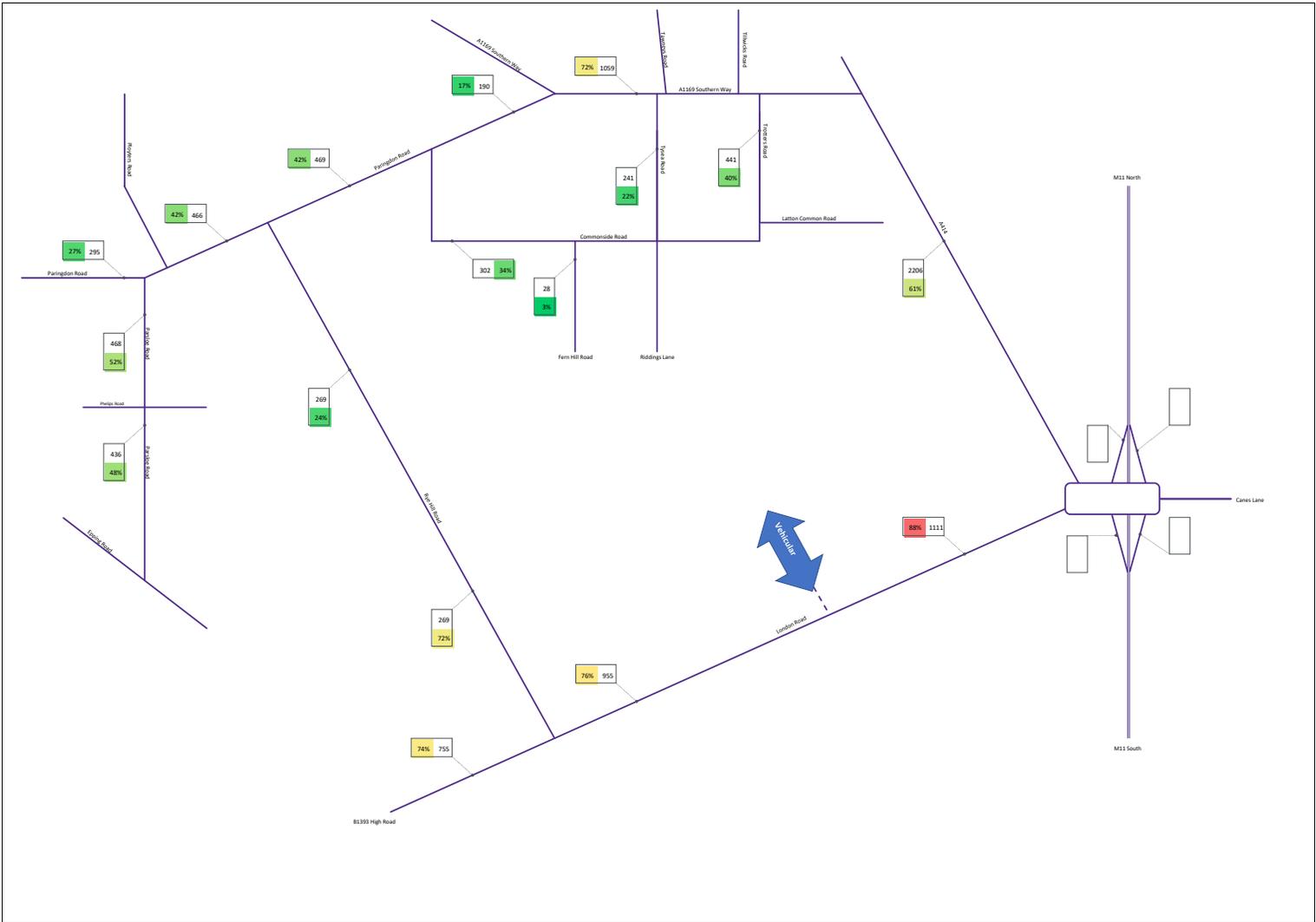
Project No.	Date	Title	Revision	Figure
4777	Jul-20	2019 AM Peak Base + Development	B	69
Project		Option 5 - Eastern Access (08:00-09:00)	Prepared By	
Lutton Priory, Harlow			EK	
Client		Notes	Checked By	
Epping Forest District Council		Figures in Black = Total vehicle flow Figures in Red = HDV %		



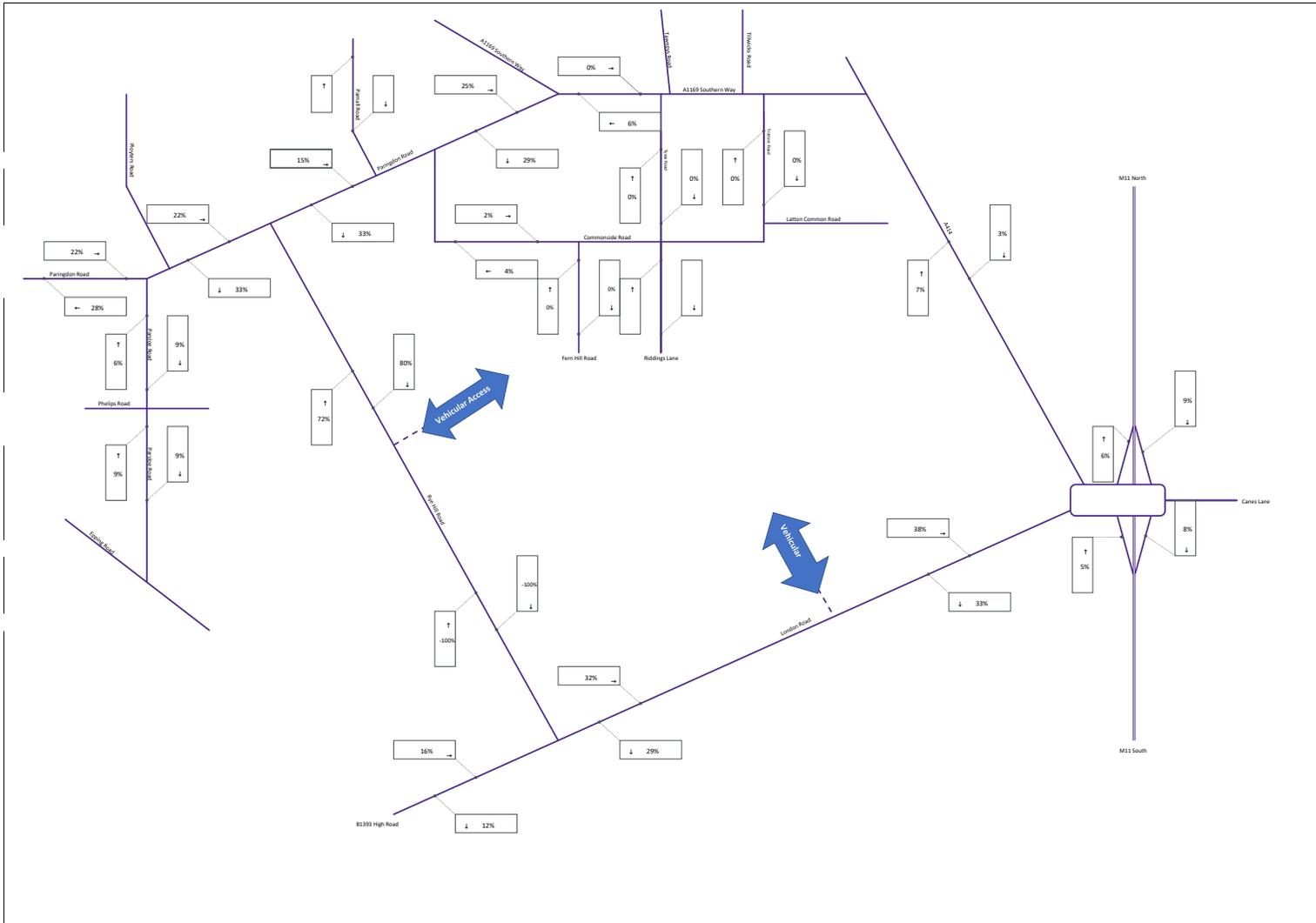
Project No.	Date	Title	Revision	Figure
4777	Jul-20	2019 AM Peak + Development Option 5 - Link Capacity Assessment (08:00-09:00)	B	71
Project		Notes	Prepared By	
Luton Priory, Harlow			EK	
Client		Checked By		
Epping Forest District Council		Flows equal the highest directional flow during the peak hour. Percentages represent the percentage of link capacity based upon TA 79/99 capacity guidance.		



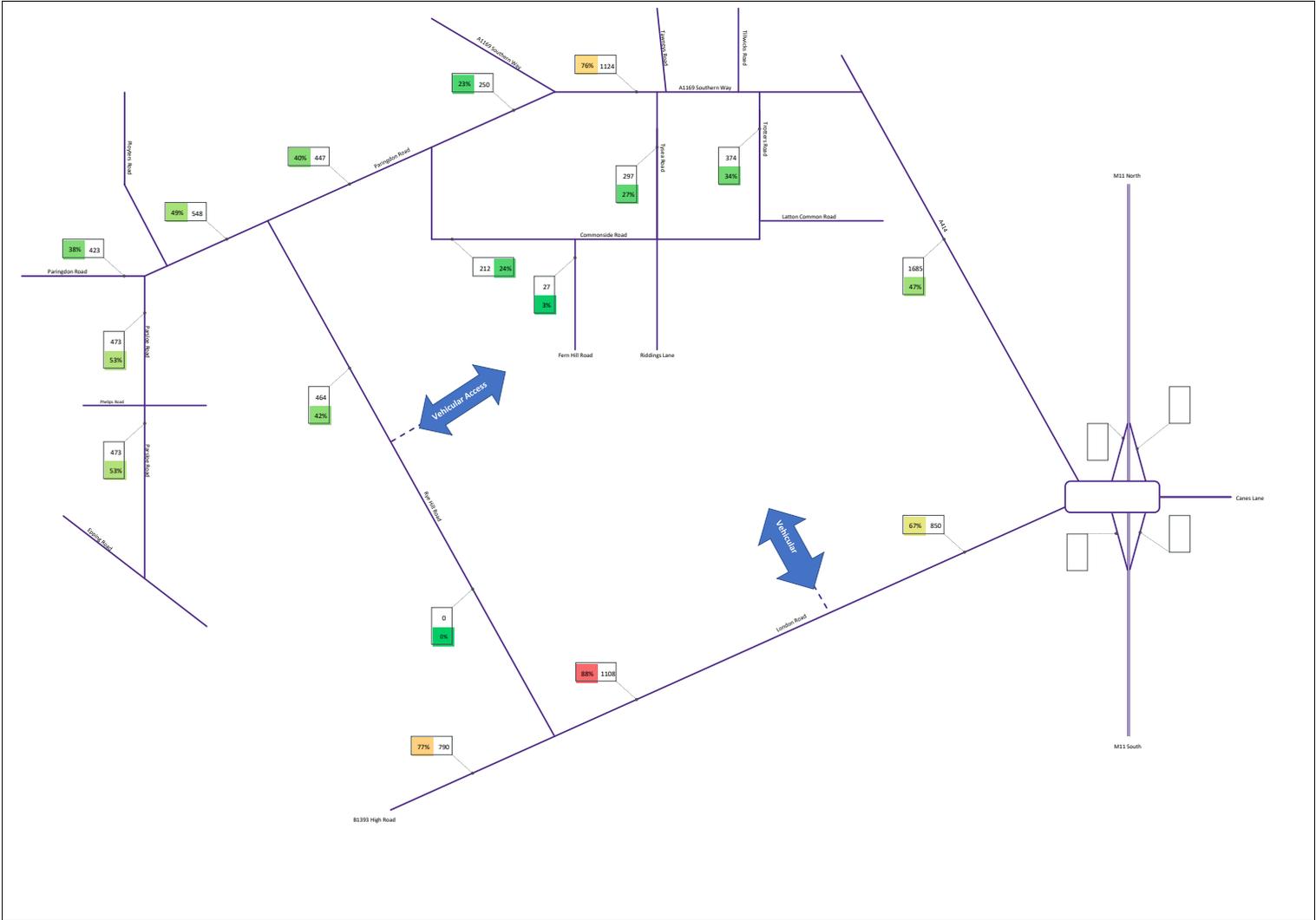
Project No.	Date	Title	Revision	Figure
4777	Jul-20	2019 PM Peak Base + Development Option 5 - Eastern Access (17:00-18:00)	B	72
Project			Prepared By	
Luton Priory, Harlow			EK	
Client		Checked By		
Epping Forest District Council		Notes		
		Figures in Black = Total vehicle flow Figures in Red = HDV %		



Project No.	Date	Title	Revision	Figure
4777	Jul-20	2019 PM Peak + Development Option 5 - Link Capacity Assessment (17:00-18:00)	B	74
Project		Lutton Priory, Harlow	Prepared By	
Client			EK	
Epping Forest District Council		Notes	Checked By	
		Flows equal the highest directional flow during the peak hour. Percentages represent the percentage of link capacity based upon TA 79/99 capacity guidance.		



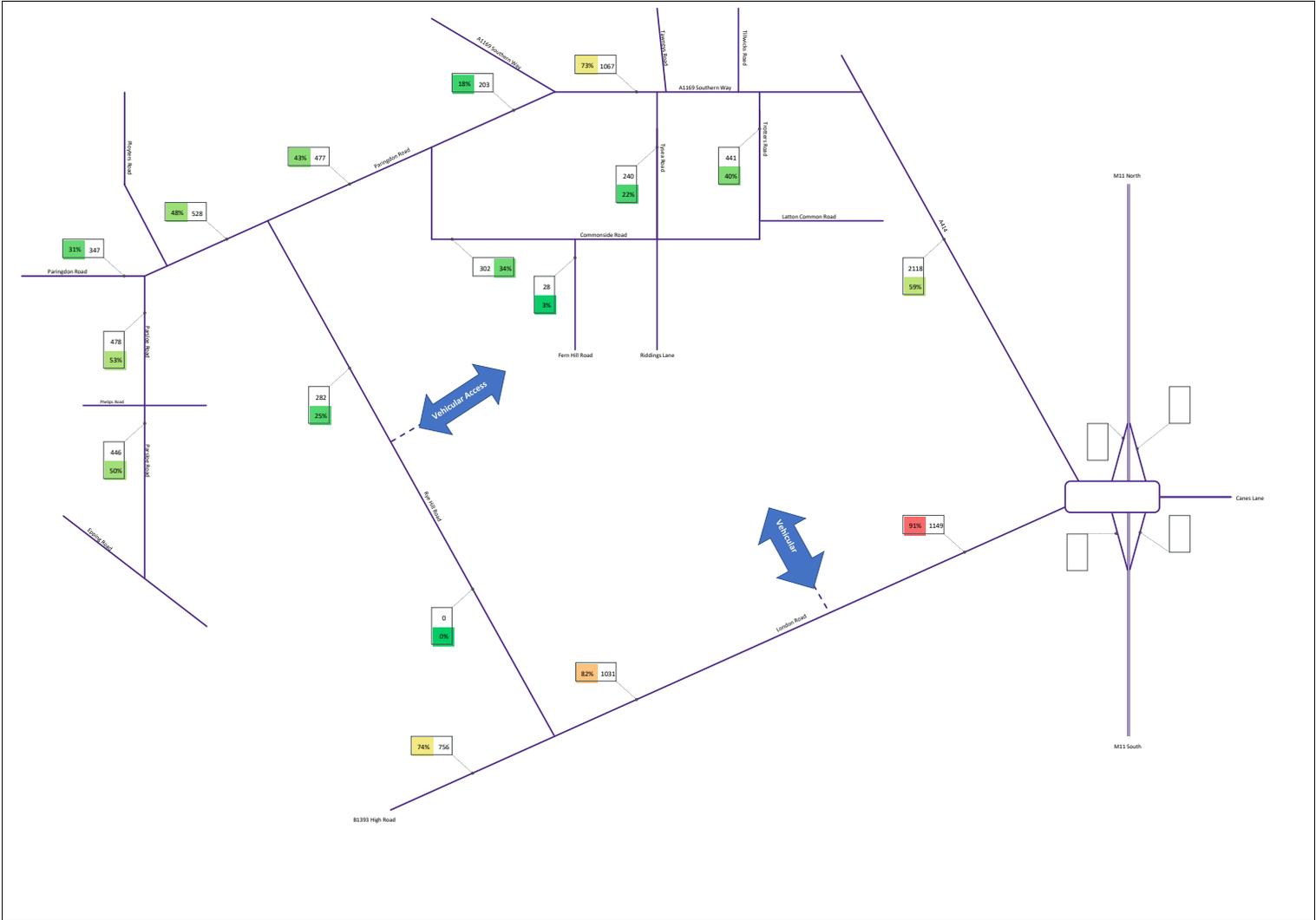
Project No.	Date	Title	Revision	Figure
4777	Jul-20	2019 AM Peak Base + Development	B	76
Project		Option 3 - Western & Eastern Accesses + Mitigation Percentage Change (08:00-09:00)	Prepared By	
Client		Notes	Checked By	
Epping Forest District Council				



Project No.	Date	Title	Revision	Figure
4777	Jul-20	2019 AM Peak - Development	B	77
Project		Option 3 - Mitigation Scenario Link Capacity Assessment	Prepared By	
Latton Priory, Harlow		(08:00-09:00)	EK	
Client		Notes	Checked By	
Epping Forest District Council		Flows equal the highest directional flow during the peak hour. Percentages represent the percentage of link capacity based upon TA 79/99 capacity guidance.		



Project No.	Date	Title	Revision	Figure
4777	Jul-20	2019 PM Peak Base + Development	B	78
Project		Option 3 - Western & Eastern Accesses + Development Mitigation	Prepared By	
Luton Priority, Harlow		(17:00-18:00)	EK	
Client		Notes	Checked By	
Epping Forest District Council		Figures in Black = Total vehicle flow Figures in Red = HDV %		



Project No.	Date	Title	Revision	Figure
4777	Jul-20	2019 PM Peak + Development	B	80
Project		Option 3 - Mitigation Scenario Link Capacity Assessment	Prepared By	
Latton Priory, Harlow		(17:00-18:00)	EK	
Client		Notes	Checked By	
Epping Forest District Council		Flows equal the highest directional flow during the peak hour. Percentages represent the percentage of link capacity based upon TA 79/99 capacity guidance.		