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Area Action Plan

Supporting Documents

VISSIM Validation Report
April 2009

Local
Development
Framework

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Colindale Area Action Plan
VISSIM Validation Report

Project No: 133133
April 2009

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Status: Final Issue no: 1 Date: 07 April 2009

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1 Introduction

1.1 Overview

1.1.1 Colin Buchanan was commissioned by the London Borough of Barnet to develop an AM peak VISSIM model of the Colindale area. The model purpose was to supplement the already existing SATURN model in analysing the detailed impact on the road network of new developments in the Colindale area.

1.2 Background

1.2.1 A calibrated and validated SATURN highway model, base year 2007 was developed on behalf of TfL by Hyder. The model analysed 2 peak periods, a weekday AM and PM peak hour. Colin Buchanan (CB) was subsequently commissioned by LB Barnet to develop Do Minimum and Do Something future year SATURN models. The main aim of the SATURN work was to understand the more strategic implications of additional development at Colindale.

1.3 Scope of the report

1.3.1 Chapter 2 provides background information.

1.3.2 Chapter 3 describes the source of data.

1.3.3 Chapter 4 describes the calibration and validation process.

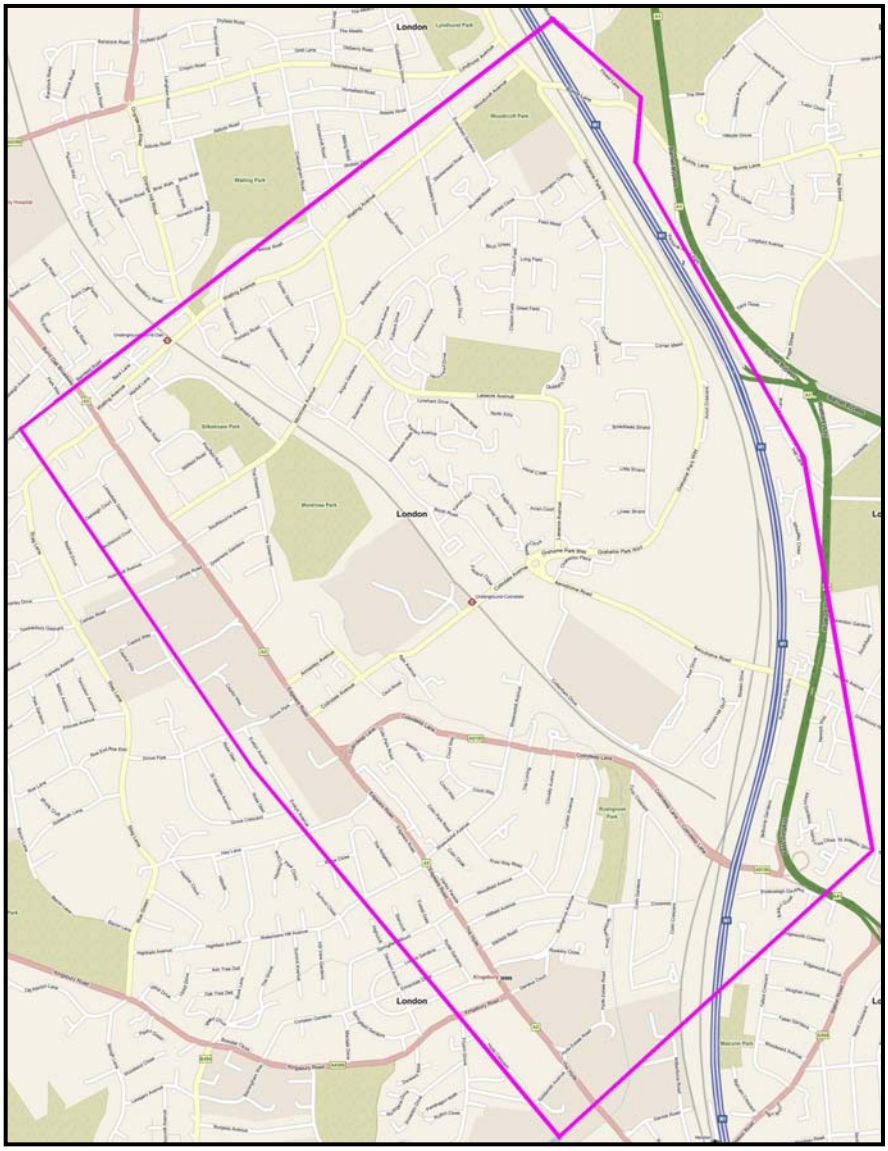
1.3.4 Chapter 5 summarises the conclusions.

2 Background information and study area

2.1 Study area

2.1.1 The extent of the VISSIM study area is shown in Figure 2.1.

Figure 2.1: Road Network Map and Boundary



3 Source of Data

3.1 Saturation flow

3.1.1 Time constraints meant that saturation flows could not be taken by site measurements and therefore RR67 guidance was used.

3.1.2 During site visits it was noted that on a number of the junctions on Edgware Road blocking back would not have allowed for saturation flow measurements to be taken. A full list of all saturation flows calculated using RR67 is included in Appendix A.

3.2 Traffic count surveys

3.2.1 Classified junction turning movement counts were available (primarily from a Hyder report dated October 2006) for three hours in the mid-week (Tuesday, Wednesday, or Thursday) morning peak period (0700 - 1000) and evening peak period (1600 - 1900) and six hours on Saturday (1000 - 1600) at 26 locations in Colindale and the surrounding district. Counts were classified using seven vehicle types. Five minute time periods were used. The survey locations are shown in Figure 3.1. The vehicle types surveyed were:

- Pedal cycles;
- Motorcycles;
- Cars and taxis;
- Light goods i.e. delivery vans excluding vehicles with twin rear tyres;
- OGV1 consisting of all goods vehicle with two axles with twin tyres, three axles (rigid), tractors, ambulances, road rollers;
- OGV2 consisting of all goods vehicles with three axles (articulated), four axles or more (rigid or articulated);
- Buses and coaches, including non-PSV mini-buses and transit-type crew buses

3.2.2 The detailed results of the traffic count surveys are shown in Appendix B. Where possible these counts were supplemented by counts conducted as part of Transport Assessments in the area.

Figure 3.1: Location of surveyed junctions

3.3 Queue length surveys

3.3.1 In addition to the junction turning movement counts, the Hyder report indicated queue lengths for each junction approach arm for the same 26 junctions, the records were taken at 5 minute intervals for the same periods as the turning movement counts. The counts took place for one mid-week day only, on a Tuesday, Wednesday or Thursday; and one Saturday.

3.3.2 The detailed results of the Queue Length surveys are also shown in Appendix B.

3.4 Journey time surveys

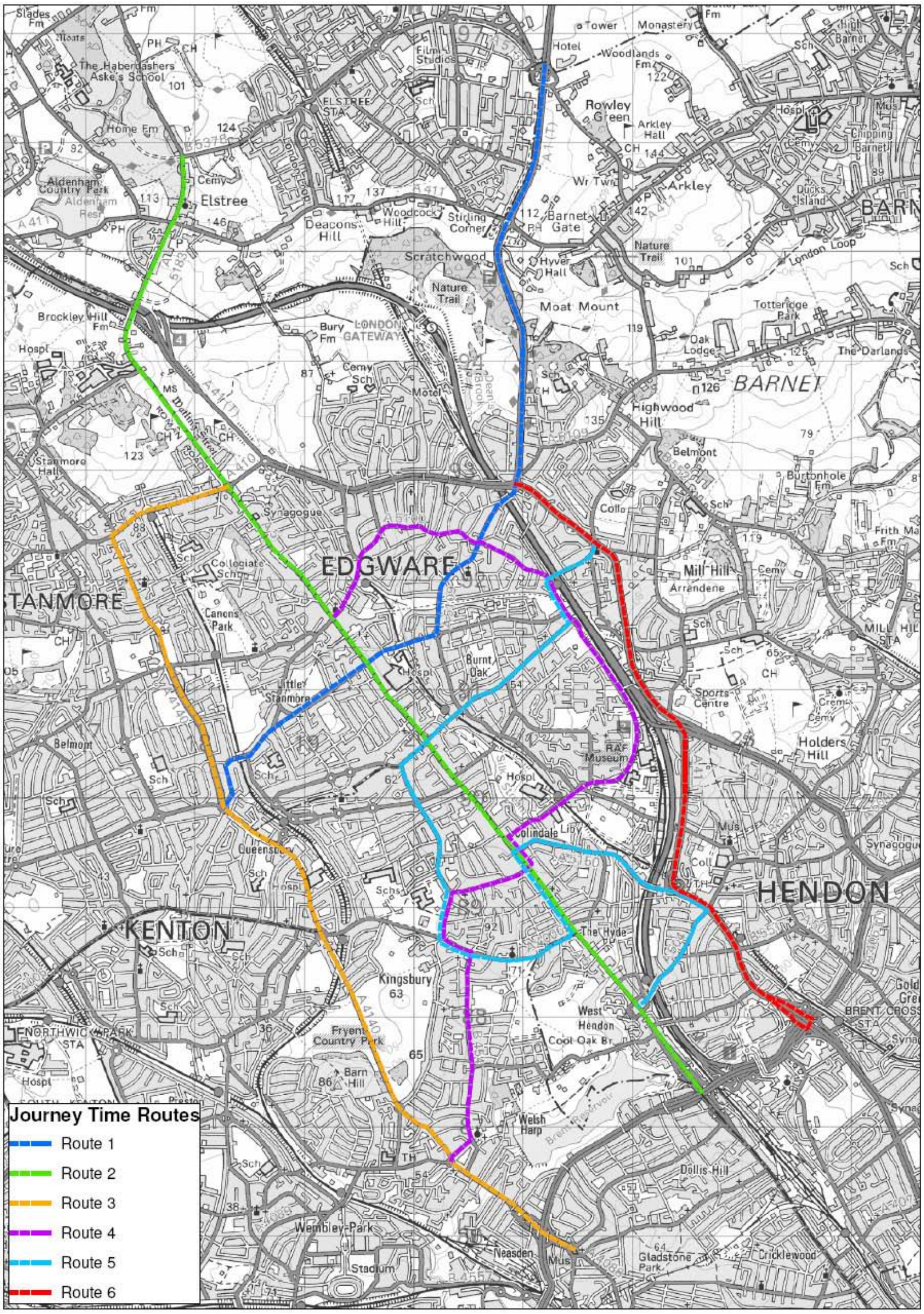
3.4.1 Journey time surveys conducted on behalf of Hyder following the guidelines laid down in Volume 12a of the Design Manual for Roads and Bridges (DMRB).The 'floating car' survey technique was utilised, whereby the survey car moves through the network on a fixed route and at the average speed of other traffic. The time periods surveyed in the mid-week surveys were the morning peak period (07:00-10:00) and the evening peak period (16:00- 19:00). The Saturday surveys were carried out between 10:00 and 16:00.

3.4.2 These surveys provided information on journey speeds and times for each link. The model's ability to accurately replicate overall journey times is an important component of the assignment and microsimulation model validation process.

3.4.3 Six routes were surveyed. The route locations are shown in Figure 3.2.

3.4.4 For each route, it was planned to carry out a total of 32 runs in each direction, comprising 12 runs in the mid-week morning peak, 12 runs in the mid-week evening peak, and 8 runs on a Saturday. Data was collected on 11/12/19/24/25 July (mid-week) and 07/14/21 July (Saturdays). However, the survey company mis-interpreted the brief, and only about a half of the intended number runs were carried out on the weekdays. Hence additional runs were carried out on 13/18/19/20/25/26/27 September (mid-week). This was obviously unfortunate since traffic conditions may vary to a certain extent between July and September.

Figure 3.2: Journey Time Surveys



3.4.5 The detailed results of the journey time survey are shown in Appendix C.

3.5 Traffic signals

3.5.1 The timing sheets, site layout drawings and controller specifications were obtained from TfL to ensure that correct information was input into the model.

3.5.2 All three signal controlled junctions within the study area are controlled using a vehicle actuation system (VA). This means that the cycle times and green times vary during the peak hour depending on the actual demand on each of the approaches.

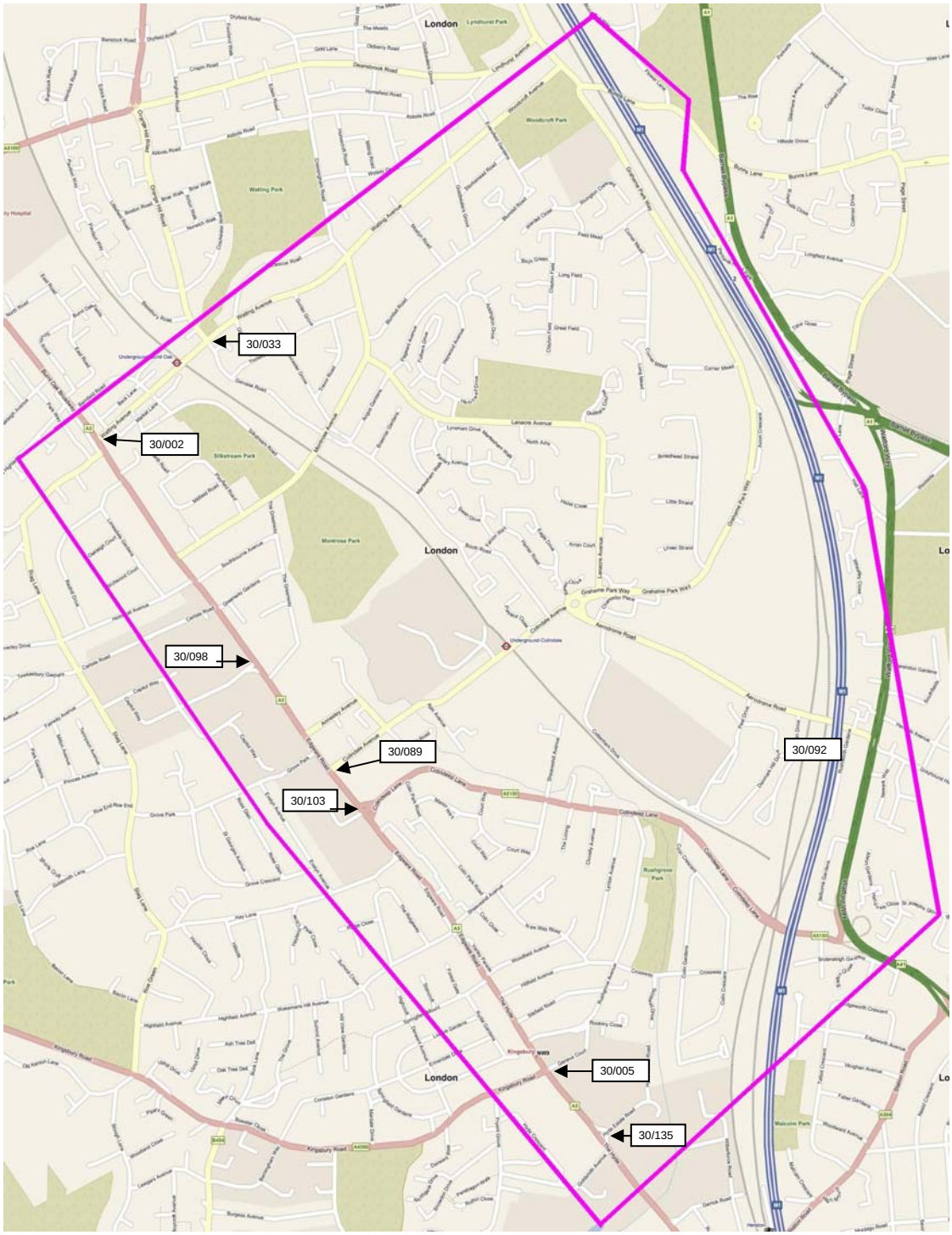
3.5.3 A green time and cycle time junction survey was undertaken on site during the AM peak. The junction timings in VISSIM were input according to the site survey and in line with the other information received from TfL.

3.5.4 As shown in Figure 3.3, the Colindale Area Action Plan VISSIM model includes the following signal controlled junctions and Pelican crossings;

- Orange Hill Road/Watling Avenue/Thirleby Road (30/033)
- Watling Avenue/Burnt Oak Broadway (30/002)
- Capitol Way/Edgware Road (30/098)
- Edgware Road/Colindale Avenue (30/089)
- Edgware Road/Colindeep Lane (30/103)
- Kingsbury Lane/Geneca Court (30/005)
- The Hyde/The Hyde Estate Road (30/135)
- Aerodrome Road/Watford Way/Greyhound Hill (30/092)

3.5.5 All relevant traffic signal information is included in Appendix D.

Figure 3.3: Signal controlled junction and pedestrian crossings



3.6 Buses

3.6.1 Within VISSIM, buses are coded into the model separately from general traffic. This enables the modelling team to enter the exact transit routes, the frequency of the services and to identify which stops are used by each bus route. All bus routes operating within the study area were included in the model and the frequencies were taken from bus timetables extracted from the TfL website. The bus routes and frequencies are summarised below:

Table 3.1: Bus Routes and Frequencies

Bus Route	Towards	AM Peak		PM Peak	
		Frequency	Bus/Hour	Frequency	Bus/Hour
32	Edgware Station	6-10 min	8	6-10 min	8
	Kilburn Park St	6-10 min	8	6-10 min	8
83	Ealing Hospital RSU	5-9 min	9	5-9 min	9
	Golders Green	5-9 min	9	5-9 min	9
114	Mill Hill Broadway St	4-6 min	12	3-7 min	12
	Ruislip St	4-6 min	12	8-12 min	6
142	Watford Junction	10-12 min	5	10-12 min	5
	Brent Cross Shopping Centre	9-13 min	5	9-13 min	5
183	Golders Green	8-12 min	6	10-13 min	5
	Pinner St CE	8-12 min	6	10-13 min	5
204	Edgware Station	10-12 min	5	10-12 min	5
	Sudbury Station	8-12 min	6	8-12 min	6
251	Arnos Grove	11-14 min	5	11-14 min	5
	Edgware Station	11-14 min	5	11-14 min	5
292	Rossington Av/Wetherby Rd	15 min	4	15 min	4
	Colindale Asda West	15 min	4	15 min	4
302	Mill Hill Broadway Station	6-9 min	8	6-10 min	8
	Kensal Rise Station	6-10 min	8	6-10 min	8
303	Edgware	15 min	4	15 min	4
	Colindale Asda West	15 min	4	15 min	4
305	Kingsbury Circle/Beechwood Grv	15 min	4	15 min	4
	Edgware Station	15 min	4	15 min	4

3.7 Two-wheelers

3.7.1 Cyclists and motorcyclists were not included in the model as they do not represent a significant percentage of traffic in this area.

4 Model Calibration and Validation

4.1 Traffic assignment

4.1.1 VISSIM is capable of operating two assignment methodologies, dynamic or static. A static model has the same assignment for the entire duration of the simulation whereas a dynamic model adapts the assignment to changing traffic conditions.

4.1.2 It was decided that the model should be developed as a static model for the base model only. Because the network structure permitted, the dynamic assignment module in VISSIM was used, but without iterating the route choice module, thereby creating a static model. The dynamic assignment was used for the proposed models.

4.2 Traffic flow matrices

4.2.1 The traffic matrices used for the purpose of the VISSIM model were extracted from the SATURN cordon of the study area.

4.2.2 For the purpose of the VISSIM validation, the SATURN matrices were adjusted based on the turning count surveys. During this adjustment, the trip ends of the matrices remained fixed within a 10% limit. This process enabled the modelling to deal with rounding issues between VISSIM and SATURN and the sometimes limited level of details of the SATURN zoning system.

4.2.3 The final VISSIM matrices had a total number of trips 0.3% higher than the SATURN total, which was regarded as acceptable.

4.3 Model time period

4.3.1 The model was run for the AM (8:00 to 9:00) peak hour only.

4.3.2 To ensure that a sufficient number of vehicles were on the network at the beginning of the model a 30-minute load up period of the peak hour matrix was added. This period was present for modelling purposes only and did not replicate the existing site conditions preceding the modelling period.

4.4 Random seed

4.4.1 For the calibration and validation process, each modelled time period was run six times with six different random seeds. This process was required to test the sensitivity of the model towards flow variations. The final output data used in the calibration and validation tables were the averages of all the runs.

4.5 Site observations

4.5.1 As part of this project, numerous site visits took place to help the team familiarise themselves with the area. The following issues were assessed, and where relevant included in the model:

- Typical driving behaviour;
- On-street parking;
- Average number of vehicles queuing at the beginning of green time;
- Kerbside activity (loading bays, taxi ranks, drop off points, coach bays);
- Queuing / capacity issues.

4.6 Saturation flows calibration

4.6.1 Table 4.1 shows a comparison between the AM VISSIM results and saturation flows measured on site/calculated using RR67.

Table 4.1: AM VISSIM Saturation Flow Calibration (PCU/h)

Junction Description	Junction Arm	Movement	RR67 Sat Flow	VISSIM Saturation Flow	Difference RR67
Edgware Rd/Stag Lane/Watling Av/Burnt Oak Bdy	Edgware Rd NB	ahead, left	1769	1819	3%
	Edgware Rd NB	ahead	1955	1972	1%
	Edgware Rd NB	right	1688	1662	-2%
	Stag Lane	left	1452	1563	8%
	Stag Lane	right	1629	1618	-1%
	Burnt Oak Bdy	ahead	1815	1894	4%
	Burnt Oak Bdy	ahead	1955	2052	5%
	Burnt Oak Bdy	right	1753	Not enough records	
	Watling Av	left	1676	1809	8%
	Watling Av	right	1777	1836	3%
Colindale Av/Edgware Rd	Edgware Rd NB	ahead	1915	1824.8	-5%
	Edgware Rd NB	right	2025	2078.6	3%
	Colindale Av	left	1727	1672.6	-3%
	Edgware Rd SB	left	1641	1711	4%
	Edgware Rd SB	ahead	1915	1859.5	-3%
Windower Avenue/Edgware Road/Colindeep Lane	Edgware Rd NB	ahead, left	1887	1974.6	5%
	Edgware Rd NB	right	1868	2014.6	8%
	Edgware Rd NB	Ahead	2055	1976.3	-4%
	Windower Avenue	right, left	1730	Not enough records	
	Edgware Rd SB	ahead and left	1768	1893.3	7%
	Edgware Rd SB	ahead	2055	1990.7	-3%
	Colindeep Lane	right	1912	1792.2	-6%
	Colindeep Lane	Ahead	2055	1835.8	-11%
	Colindeep Lane	left	1702	1698.1	0%
Edgware Road/Kingsbury Rd/Rookery Way	Edgware Rd NB	left	1694	1734.3	2%
	Edgware Rd NB	ahead	2055	1950.2	-5%
	Kingsbury Rd	ahead, left	1863	1833.9	-2%
	Kingsbury Rd	right	1816	1866.6	3%
	Edgware Rd SB	ahead and left	1862	1821.1	-2%
	Edgware Rd SB	ahead	2025	2073.1	2%
	Edgware Rd SB	right	1782	1665.7	-7%
Watford Way/Aerodrome Road/Greyhound Hill	Watford Way NB	ahead and right	1873	1878.8	0%
	Watford Way NB	ahead	2055	2176.8	6%
	Watford Way NB	ahead	2055	2098.9	2%
	Watford Way NB	right	2111	2043.9	-3%
	Aerodrome Rd	ahead right and left	1860	1850.3	-1%
	Edgware Rd SB	ahead and left	1869	1861.3	0%
	Edgware Rd SB	ahead	2055	2184	6%
	Edgware Rd SB	ahead	2055	2202.8	7%
	Edgware Rd SB	right	2026	2016.1	-1%

4.6.2 The results of the AM peak saturation flow calibration show that all VISSIM results fall within 10% of RR67 estimates with the exception of the ahead lane of Colindeep Lane at the junction with Edgware Road. At this location, the saturation flow falls within 11% of the value calculated using RR67.

4.6.3 Overall, the saturation flow calibration was regarded as acceptable.

4.7 Turning Count Validation

4.7.1 The DTO Modelling Guidelines document states that the traffic flow in the model should be within a Geoffrey E. Havers (GEH) value of five comparing to the traffic counts.

4.7.2 The GEH formula used the model validation process.

$$GEH = \sqrt{\frac{(M-C)^2}{(M+C)/2}}$$

Where: GEH is the GEH statistic

M is the modelled flow

C is the observed flow

4.7.3 All the junctions included in the traffic count survey were included in the traffic flow validation process.

4.7.4 Table 4.2 details the turning count results for the AM peak period. The table is presented in vehicles.

Table 4.2: AM Turning Count Validation

Site	From street	To street	From	To	Validation Dataset (AM)	VISSIM average flow (AM)	GEH
13	Colindeep Ln	A41 northbound	W	N	232	272	2.5
	Colindeep Ln	A41 southbound	W	E	541	531	0.5
	A41 NB Off Slip	Colindeep Ln	E	W	731	620	4.3
8	The Hyde (S)	Kingsbury Rd	SE	SW	316	308	0.4
	The Hyde (S)	The Hyde (N)	SE	NW	579	586	0.3
	Kingsbury Rd	The Hyde (S)	SW	SE	417	374	2.2
	Kingsbury Rd	The Hyde (N)	SW	NW	168	200	2.4
	Kingsbury Rd	Rookery Way	SW	NE	183	121	5.0
	The Hyde (N)	The Hyde (S)	NW	SE	642	615	1.1
	The Hyde (N)	Kingsbury Rd	NW	SW	243	201	2.8
	The Hyde (N)	Rookery Way	NW	NE	31	41	1.7
14	Edgware Rd (S)	Windover Ln	SE	W	56	45	1.6
	Edgware Rd (S)	Edgware Rd (N)	SE	NW	792	755	1.3
	Edgware Rd (S)	Colindeep Ln	SE	E	183	119	5.2
	Windover Ln	Edgware Rd (S)	W	SE	4	4	0.2
	Windover Ln	Edgware Rd (N)	W	NW	10	0	4.5
	Windover Ln	Colindeep Ln	W	E	1	3	1.3
	Edgware Rd (N)	Edgware Rd (S)	NW	SE	812	680	4.8
	Edgware Rd (N)	Windover Ln	NW	W	27	16	2.4
	Edgware Rd (N)	Colindeep Ln	NW	E	409	453	2.1
	Colindeep Ln	Edgware Rd (S)	E	SE	116	86	3.0
	Colindeep Ln	Windover Ln	E	W	25	24	0.3
	Colindeep Ln	Edgware Rd (N)	E	NW	366	296	3.8
15	Edgware Rd (S)	Edgware Rd (N)	SE	NW	749	679	2.6
	Edgware Rd (S)	Colindale Ave	SE	NE	351	363	0.6
	Edgware Rd (N)	Edgware Rd (S)	NW	SE	872	787	3.0
	Edgware Rd (N)	Colindale Ave	NW	NE	170	137	2.6
	Colindale Ave	Edgware Rd (S)	NE	SE	429	364	3.3
27	Edgware Rd	Burnt Oak Bdy	SE	NW	548	553	0.2
	Edgware Rd	Montrose Ave	SE	NE	204	201	0.2
	Burnt Oak Bdy	Edgware Rd	NW	SE	653	703	1.9
	Burnt Oak Bdy	Montrose Ave	NW	NE	104	60	4.9
	Montrose Ave	Edgware Rd	NE	SE	395	284	6.0
	Montrose Ave	Burnt Oak Bdy	NE	NW	28	9	4.3
20	Burnt Oak Bdy (S)	Stag Ln	SE	SW	35	41	1.0
	Burnt Oak Bdy (S)	Burnt Oak Bdy (N)	SE	NW	479	461	0.8
	Burnt Oak Bdy (S)	Watling Ave	SE	NE	59	56	0.4
	Stag Ln	Burnt Oak Bdy (S)	SW	SE	64	93	3.3
	Stag Ln	Burnt Oak Bdy (N)	SW	NW	104	75	3.1
	Stag Ln	Watling Ave	SW	NE	168	185	1.3
	Burnt Oak Bdy (N)	Burnt Oak Bdy (S)	NW	SE	585	576	0.4

Site	From street	To street	From	To	Validation Dataset (AM)	VISSIM average flow (AM)	GEH
	Burnt Oak Bdy (N)	Stag Ln	NW	SW	60	38	3.1
	Burnt Oak Bdy (N)	Watling Ave	NW	NE	127	106	1.9
	Watling Ave	Burnt Oak Bdy (S)	NE	SE	99	92	0.7
	Watling Ave	Stag Ln	NE	SW	191	179	0.9
	Watling Ave	Burnt Oak Bdy (N)	NE	NW	103	127	2.2
18	Bunns Ln (S)	Woodcroft Ave	SE	SW	248	263	0.9
	Bunns Ln (S)	Bunns Ln (N)	SE	NW	533	431	4.6
	Woodcroft Ave	Bunns Ln (S)	SW	SE	181	122	4.8
	Woodcroft Ave	Bunns Ln (N)	SW	NW	120	114	0.5
	Bunns Ln (N)	Bunns Ln (S)	NW	SE	830	801	1.0
	Bunns Ln (N)	Woodcroft Ave	NW	SW	76	72	0.5
CB spot check	Watling Ave (W)	Orange Hill Rd	SW	NW	124	176	4.3
	Watling Ave (W)	Watling Ave (E)	SW	NE	128	117	1.0
	Watling Ave (W)	Gervase Rd	SW	SE	20	46	4.5
	Orange Hill Rd	Watling Ave (W)	NW	SW	156	203	3.5
	Orange Hill Rd	Watling Ave (E)	NW	NE	28	11	3.9
	Orange Hill Rd	Gervase Rd	NW	SE	180	87	8.0
	Watling Ave (E)	Watling Ave (W)	NE	SW	128	190	4.9
	Watling Ave (E)	Orange Hill Rd	NE	NW	16	10	1.6
	Watling Ave (E)	Gervase Rd	NE	SE	12	0	4.9
	Gervase Rd	Watling Ave (W)	SE	SW	48	19	5.0
	Gervase Rd	Orange Hill Rd	SE	NW	64	258	15.3
	Gervase Rd	Watling Ave (E)	SE	NE	8	0	4.0
WSP 2003	Watford Way (S)	Aerodrome Rd	S	W	220	261	2.6
	Watford Way (S)	Watford Way (N)	S	N	1542	1420	3.2
	Watford Way (S)	Greyhound Hill	S	E	123	160	3.1
	Aerodrome Rd	Watford Way (S)	W	S	183	170	1.0
	Aerodrome Rd	Watford Way (N)	W	N	57	51	0.8
	Aerodrome Rd	Greyhound Hill	W	E	229	292	3.9
	Watford Way (N)	Watford Way (S)	N	S	1731	1646	2.1
	Watford Way (N)	Aerodrome Rd	N	W	331	135	12.8
	Watford Way (N)	Greyhound Hill	N	E	70	112	4.4
	Greyhound Hill	Watford Way (S)	E	S	51	52	0.1
	Greyhound Hill	Aerodrome Rd	E	W	194	155	3.0
	Greyhound Hill	Watford Way (N)	E	N	120	94	2.6
WSP 2003	Edgware Rd (S)	Edgware Rd (N)	SE	NW	771	707	2.3
	Edgware Rd (S)	Annesley Ave	SE	NE	5	0	3.2
	Edgware Rd (N)	Edgware Rd (S)	NW	SE	867	918	1.7
	Edgware Rd (N)	Annesley Ave	NW	NE	4	0	2.8
	Annesley Ave	Edgware Rd (S)	NE	SE	101	68	3.6
	Annesley Ave	Edgware Rd (N)	NE	NW	83	148	6.0

Site	From street	To street	From	To	Validation Dataset (AM)	VISSIM average flow (AM)	GEH
16	Colindale Ave	Raven Close	W	N	13	20	1.8
	Colindale Ave	Grahame Park Way	W	NE	289	336	2.7
	Colindale Ave	Aerodrome Rd	W	SE	242	244	0.2
	Raven Close	Colindale Ave	N	W	37	45	1.3
	Raven Close	Grahame Park Way	N	NE	29	34	0.9
	Raven Close	Aerodrome Rd	N	SE	37	47	1.6
	Grahame Park Way	Colindale Ave	NE	W	432	433	0.1
	Grahame Park Way	Raven Close	NE	N	21	9	3.2
	Grahame Park Way	Aerodrome Rd	NE	SE	269	289	1.2
	Aerodrome Rd	Colindale Ave	SE	W	242	290	2.9
	Aerodrome Rd	Raven Close	SE	N	5	4	0.5
	Aerodrome Rd	Grahame Park Way	SE	NE	237	224	0.9
19	Montrose Ave	Watling Ave (W)	S	SW	50	18	5.5
	Montrose Ave	Cressingham Rd	S	NW	85	84	0.1
	Montrose Ave	Watling Ave (E)	S	NE	154	134	1.6
	Watling Ave (W)	Montrose Ave	SW	S	49	23	4.3
	Watling Ave (W)	Cressingham Rd	SW	NW	22	21	0.3
	Watling Ave (W)	Watling Ave (E)	SW	NE	121	109	1.1
	Cressingham Rd	Montrose Ave	NW	S	78	68	1.2
	Cressingham Rd	Watling Ave (W)	NW	SW	16	13	0.8
	Cressingham Rd	Watling Ave (E)	NW	NE	10	10	0.2
	Watling Ave (E)	Montrose Ave	NE	S	286	276	0.6
	Watling Ave (E)	Watling Ave (W)	NE	SW	200	258	3.8
	Watling Ave (E)	Cressingham Rd	NE	NW	6	8	0.6
WSP 2003	Grahame Park Way	Bunns Ln (NW)	S	NW	350	146	12.9
	Grahame Park Way	Bunns Ln (E)	S	E	289	211	4.9
	Bunns Ln (NW)	Grahame Park Way	NW	S	322	164	10.2
	Bunns Ln (NW)	Bunns Ln (E)	NW	E	677	760	3.1
	Bunns Ln (E)	Grahame Park Way	E	S	288	114	12.3
	Bunns Ln (E)	Bunns Ln (NW)	E	NW	560	548	0.5

4.7.5 The GEH results for the AM peak period show that the model has an excellent turning count validation, with 91% of all turning movements falling within 5 GEH of the surveyed data.

4.7.6 Some turning counts have large GEH results although none of these were compared to older 2003 counts. The results could not have been improved without breaking the link with the SATURN model. It was therefore decided to leave the assignment as presented in Table 4.2.

4.8 General Traffic Journey Time Validation

4.8.1 The DTO modelling guidelines suggest 15% as a validation criteria for journey time data.

4.8.2 Table 4.3 shows the journey time results for the AM peak, as well as the percentage difference between the observed and modelled results.

Table 4.3 AM Journey Time Validation (seconds)

Section	Observed	Model	Difference
Route 1 Northbound	300.0	296.2	-1.3%
Route 2 Southbound	392.0	287.4	-26.7%
Route 4 Northbound	382.0	376.6	-1.4%
Route 4 Southbound	387.0	384.8	-0.6%
Route 5N Eastbound	235.0	257.8	9.7%
Route 5N Westbound	235.0	264.1	12.4%
Route 5S Eastbound	238.0	241.5	1.5%
Route 5S Westbound	295.0	314.9	6.7%

4.8.3 The results in Table 4.3 show that during the AM peak the journey time results validate very closely with the observed journey time data, both northbound and southbound.

4.8.4 Only Route 2 southbound (Edgware Road) does not validate, with a difference of 26.7%

4.9 Traffic Queues

4.9.1 The queue length is not a validation parameter and is usually not seen as critical in the validation of a VISSIM model. The reason behind the careful usage of queue records from VISSIM is mainly due to definition discrepancies between the software and between survey methods. However, queue length is a critical parameter for blocking-back situations and for traffic signal optimisation.

4.9.2 In VISSIM, the queues were recorded in 300 second intervals. The average of the maximum values obtained were then used to compare the queues with surveyed data.

4.9.3 Table 4.4 shows the AM peak queue length survey results next to the AM peak VISSIM measurements. The results are presented in PCU's.

Table 4.4: AM Peak Queue Comparison (PCU's)

Site	Junction	Approach	Queue Traffic		Difference (PCU's)
			Measured AM	VISSIM AM	
8	Junction 3	The Hyde (SB)	37	13	-23
		The Hyde (NB)	27	12	-15
		Kingsbury Rd (EB)	27	8	-19
14	Junction 4	Edgware (NB)	12	8	-4
		Edgware (SB)	4	14	10
		Colindeep Lane (WB)	3	8	5
		Windover Lane (EB)	1	1	0
15	Junction 5	Edgware Road (SB)	3	19	16
		Colindale Avenue (SWB)	15	19	4
		Edgware Road (NB)	8	14	6
27	Junction 7	Montrose Avenue (WB)	3	4	0
		Edgware Road (NB)	1	6	4
20	Junction 8	Burnt Oak Broadway (SEB)	21	14	-7
		Watling Avenue (WB)	8	16	7
		Burnt Oak Broadway (NWB)	8	11	3
		Stag Lane (EB)	6	5	-1
18	Junction 9	Bunns Lane (SB)	3	3	1
		Woodcroft Avenue (EB)	3	5	2
		Bunns Lane (NB)	12	1	-11
16	Junction 201	Eagle Drive (SEB)	1	2	1
		Grahame Park Way (SWB)	3	6	4
		Aerodrome Road (WB)	3	4	2
		Colindale Avenue (NEB)	4	12	8
19	Junction 202	Watling Avenue (NEB)	1	0	-1
		Cressingham Road (SEB)	1	0	-1
		Watling Avenue (SWB)	1	2	1
		Montrose Avenue (NWB)	2	1	-1

4.9.4 The comparison of the AM traffic queues generated in VISSIM and those measured on site show very similar results at most junctions.

5 Conclusion

5.1.1 Colin Buchanan was commissioned by the London Borough of Barnet to undertake an AM VISSIM model of the Colindale area. This model purpose was to supplement the already existing SATURN model in analysing the impact on the road network of new developments in the Colindale area.

5.1.2 The Colindale base VISSIM model has been validated to a high standard and reflects the traffic conditions being experienced on the existing network. The turning counts, journey times and queue counts have been validated across the network and CB feel that this model is fit for purpose in relation to analysis of future development within the network.

5.1.3 The testing of the impact of the proposed development will be detailed in a separate report.

Appendix A - Saturation Flows

Job No. 133133

RR 67 Calculations For

Job Title	Colindale Area Action Plan

Approach	Movement	Lane width (w)	Near side Yes= 140 No= 0 (n)	Radius (r)	% Turning (t)	Saturation Flow
Edgware Rd/Stag Lane/Watling Av/Burnt Oak Bdy						
Edgware Rd NB	ahead, left	2	yes	7.5	13%	**1769**
Edgware Rd NB	ahead	2	no	100	0%	**1955**
Edgware Rd NB	right	2	no	9.5	100%	**1688**
Stag Lane	left	2	yes	6	100%	**1452**
Stag Lane	right	2	no	7.5	100%	**1629**
Burnt Oak Bdy	ahead	2	yes	100	0%	**1815**
Burnt Oak Bdy	ahead	2	no	100	0%	**1955**
Burnt Oak Bdy	right	2	no	13	100%	**1753**
Watling Av	left	2	yes	9	100%	**1676**
Watling Av	right	2	no	15	100%	**1777**
Colindale Av/Edgware Rd						
Edgware Rd NB	ahead	3	yes	100	0%	**1915**
Edgware Rd NB	right	3	no	100	100%	**2025**
Colindale Av	left	4	yes	9	100%	**1727**
Edgware Rd SB	left	3	yes	9	100%	**1641**
Edgware Rd SB	ahead	3	yes	100	0%	**1915**
Windower Avenue/Edgware Road/Colindeep Lane						
Edgware Rd NB	ahead,left	3	yes	12	12%	**1887**
Edgware Rd NB	right	3	no	15	100%	**1868**
Edgware Rd NB	Ahead	3	no	100	0%	**2055**
Windower Avenue	right, left	3	yes	14	100%	**1730**
Edgware Rd SB	ahead and left	3	yes	9	50%	**1768**
Edgware Rd SB	ahead	3	no	100	0%	**2055**
Colindeep Lane	right	3	no	20	100%	**1912**
Colindeep Lane	Ahead	3	no	100	0%	**2055**
Colindeep Lane	left	3	yes	12	100%	**1702**
Edgware Road/Kingsbury Rd/Rookery Way						
Edgware Rd NB	left	3	yes	12	100%	**1694**
Edgware Rd NB	ahead	3	no	100	0%	**2055**
Kingsbury Rd	ahead,left	2.7	yes	13	10%	**1863**
Kingsbury Rd	right	2.7	no	13	100%	**1816**
Edgware Rd SB	ahead and left	2.7	yes	11	9%	**1862**
Edgware Rd SB	ahead	2.7	no	100	0%	**2025**
Edgware Rd SB	right	2.7	no	11	100%	**1782**
Watford Way/Aerodrome Road/Greyhound Hill						
Watford Way NB	ahead and right	3	yes	25	37%	**1873**
Watford Way NB	ahead	3	no	100	0%	**2055**
Watford Way NB	ahead	3	no	100	0%	**2055**
Watford Way NB	right	5	no	22	100%	**2111**
Aerodrome Rd	ahead right and left	4	yes	18	100%	**1860**
Edgware Rd SB	ahead and left	3	yes	27	44%	**1869**
Edgware Rd SB	ahead	3	no	100	0%	**2055**
Edgware Rd SB	ahead	3	no	100	0%	**2055**
Edgware Rd SB	right	4.5	no	17	100%	**2026**

Appendix B - Traffic Count & Queue Length Surveys

	base_v30.inp				Survey	
	From street	To street	From	To	site number	AM flows
junction 2	Colindeep Ln	A41 northbound	W	N		232
	Colindeep Ln	A41 southbound	W	E	13	541
	A41 NB Off Slip	Colindeep Ln	E	W		731
junction 3	The Hyde (S)	Kingsbury Rd	SE	SW		316
	The Hyde (S)	The Hyde (N)	SE	NW		579
	Kingsbury Rd	The Hyde (S)	SW	SE		417
	Kingsbury Rd	The Hyde (N)	SW	NW	8	168
	Kingsbury Rd	Rookery Way	SW	NE		183
	The Hyde (N)	The Hyde (S)	NW	SE		642
	The Hyde (N)	Kingsbury Rd	NW	SW		243
	The Hyde (N)	Rookery Way	NW	NE		31
junction 4	Edgware Rd (S)	Windover Ln	SE	W		56
	Edgware Rd (S)	Edgware Rd (N)	SE	NW		792
	Edgware Rd (S)	Colindeep Ln	SE	E		183
	Windover Ln	Edgware Rd (S)	W	SE		4
	Windover Ln	Edgware Rd (N)	W	NW		10
	Windover Ln	Colindeep Ln	W	E	14	1
	Edgware Rd (N)	Edgware Rd (S)	NW	SE		812
	Edgware Rd (N)	Windover Ln	NW	W		27
	Edgware Rd (N)	Colindeep Ln	NW	E		409
	Colindeep Ln	Edgware Rd (S)	E	SE		116
	Colindeep Ln	Windover Ln	E	W		25
	Colindeep Ln	Edgware Rd (N)	E	NW		366
junction 5	Edgware Rd (S)	Edgware Rd (N)	SE	NW		749
	Edgware Rd (S)	Colindale Ave	SE	NE		351
	Edgware Rd (N)	Edgware Rd (S)	NW	SE	15	872
	Edgware Rd (N)	Colindale Ave	NW	NE		170
	Colindale Ave	Edgware Rd (S)	NE	SE		429
junction 7	Edgware Rd	Burnt Oak Bdy	SE	NW		548
	Edgware Rd	Montrose Ave	SE	NE		204
	Burnt Oak Bdy	Edgware Rd	NW	SE	27	653
	Burnt Oak Bdy	Montrose Ave	NW	NE		104
	Montrose Ave	Edgware Rd	NE	SE		395
	Montrose Ave	Burnt Oak Bdy	NE	NW		28
junction 8 - VISSIM	Burnt Oak Bdy (S)	Stag Ln	SE	SW		35
	Burnt Oak Bdy (S)	Burnt Oak Bdy (N)	SE	NW		479
	Burnt Oak Bdy (S)	Watling Ave	SE	NE		59
	Stag Ln	Burnt Oak Bdy (S)	SW	SE		64
	Stag Ln	Burnt Oak Bdy (N)	SW	NW		104
	Stag Ln	Watling Ave	SW	NE	20	168
	Burnt Oak Bdy (N)	Burnt Oak Bdy (S)	NW	SE		585
	Burnt Oak Bdy (N)	Stag Ln	NW	SW		60
	Burnt Oak Bdy (N)	Watling Ave	NW	NE		127
	Watling Ave	Burnt Oak Bdy (S)	NE	SE		99
	Watling Ave	Stag Ln	NE	SW		191
	Watling Ave	Burnt Oak Bdy (N)	NE	NW		103
junction 9	Bunns Ln (S)	Woodcroft Ave	SE	SW		248
	Bunns Ln (S)	Bunns Ln (N)	SE	NW		533
	Woodcroft Ave	Bunns Ln (S)	SW	SE	18	181
	Woodcroft Ave	Bunns Ln (N)	SW	NW		120
	Bunns Ln (N)	Bunns Ln (S)	NW	SE		830
	Bunns Ln (N)	Woodcroft Ave	NW	SW		76
junction 11	Watling Ave (W)	Orange Hill Rd	SW	NW		124
	Watling Ave (W)	Watling Ave (E)	SW	NE		128
	Watling Ave (W)	Gervase Rd	SW	SE		20
	Orange Hill Rd	Watling Ave (W)	NW	SW		156
	Orange Hill Rd	Watling Ave (E)	NW	NE		28
	Orange Hill Rd	Gervase Rd	NW	SE		180
	Watling Ave (E)	Watling Ave (W)	NE	SW	spot check	128
	Watling Ave (E)	Orange Hill Rd	NE	NW		16
	Watling Ave (E)	Gervase Rd	NE	SE		12
	Gervase Rd	Watling Ave (W)	SE	SW		48
	Gervase Rd	Orange Hill Rd	SE	NW		64
	Gervase Rd	Watling Ave (E)	SE	NE		8
junction 12	Watford Way (S)	Aerodrome Rd	S	W		220
	Watford Way (S)	Watford Way (N)	S	N		1542
	Watford Way (S)	Greyhound Hill	S	E		123
	Aerodrome Rd	Watford Way (S)	W	S		183
	Aerodrome Rd	Watford Way (N)	W	N		57
	Aerodrome Rd	Greyhound Hill	W	E		229
	Watford Way (N)	Watford Way (S)	N	S	WSP 2003	1731
	Watford Way (N)	Aerodrome Rd	N	W		331
	Watford Way (N)	Greyhound Hill	N	E		70
	Greyhound Hill	Watford Way (S)	E	S		51
	Greyhound Hill	Aerodrome Rd	E	W		194
	Greyhound Hill	Watford Way (N)	E	N		120
junction 106	Edgware Rd (S)	Edgware Rd (N)	SE	NW		771
	Edgware Rd (S)	Annesley Ave	SE	NE		5
	Edgware Rd (N)	Edgware Rd (S)	NW	SE	WSP 2003	867
	Edgware Rd (N)	Annesley Ave	NW	NE		4
	Annesley Ave	Edgware Rd (S)	NE	SE		101
	Annesley Ave	Edgware Rd (N)	NE	NW		83
junction 201	Colindale Ave	Raven Close	W	N		13
	Colindale Ave	Grahame Park Way	W	NE		289
	Colindale Ave	Aerodrome Rd	W	SE		242
	Raven Close	Colindale Ave	N	W		37
	Raven Close	Grahame Park Way	N	NE		29
	Raven Close	Aerodrome Rd	N	SE	16	37
	Grahame Park Way	Colindale Ave	NE	W		432
	Grahame Park Way	Raven Close	NE	N		21
	Grahame Park Way	Aerodrome Rd	NE	SE		269
	Aerodrome Rd	Colindale Ave	SE	W		242
	Aerodrome Rd	Raven Close	SE	N		5
	Aerodrome Rd	Grahame Park Way	SE	NE		237
junction 202	Montrose Ave	Watling Ave (W)	S	SW		50
	Montrose Ave	Cressingham Rd	S	NW		85
	Montrose Ave	Watling Ave (E)	S	NE		154
	Watling Ave (W)	Montrose Ave	SW	S		49
	Watling Ave (W)	Cressingham Rd	SW	NW		22
	Watling Ave (W)	Watling Ave (E)	SW	NE	19	121
	Cressingham Rd	Montrose Ave	NW	S		78
	Cressingham Rd	Watling Ave (W)	NW	SW		16
	Cressingham Rd	Watling Ave (E)	NW	NE		10
	Watling Ave (E)	Montrose Ave	NE	S		286
	Watling Ave (E)	Watling Ave (W)	NE	SW		200
	Watling Ave (E)	Cressingham Rd	NE	NW		6
junction 203	Grahame Park Way	Bunns Ln (NW)	S	NW		350
	Grahame Park Way	Bunns Ln (E)	S	E		289
	Bunns Ln (NW)	Grahame Park Way	NW	S	WSP 2003	322
	Bunns Ln (NW)	Bunns Ln (E)	NW	E		677
	Bunns Ln (E)	Grahame Park Way	E	S		288
	Bunns Ln (E)	Bunns Ln (NW)	E	NW		560

Site number	Junction Name	ARM	AM Observed queue in meters		
			min	max	average
8	junction 3	The Hyde (SB)	150	270	220
		The Hyde (NB)	100	230	160
		Kingsbury Rd (EB)	40	250	160
14	junction 4	Edgware (NB)	30	120	70
		Edgware (SB)	0	45	25
		Colindeep Lane (WB)	5	50	20
		Windover Lane (EB)	0	25	5
15	junction 5	Edgware Road (SB)	0	50	20
		Colindale Avenue (SWB)	50	110	90
		Edgware Road (NB)	20	70	50
27	junction 7	Montrose Avenue (WB)	5	35	20
		Edgware Road (NB)	0	20	8
20	junction 8	Burnt Oak Broadway (SEB)	60	250	125
		Watling Avenue (WB)	10	90	50
		Burnt Oak Broadway (NWB)	10	80	50
		Stag Lane (EB)	0	60	35
18	junction 9	Bunns Lane (SB)	0	110	15
		Woodcroft Avenue (EB)	0	90	18
		Bunns Lane (NB)	10	180	70
16	junction 201	Eagle Drive (SEB)	0	20	5
		Grahame Park Way (SWB)	0	50	15
		Aerodrome Road (WB)	0	40	15
		Colindale Avenue (NEB)	0	50	25
19	junction 202	Watling Avenue (NEB)	0	15	5
		Cressingham Road (SEB)	0	10	5
		Watling Avenue (SWB)	0	30	5
		Montrose Avenue (NWB)	0	50	10

Appendix C - Journey Time Surveys

AM

Time in seconds
Distance in metres

Edgware Rd

NB

	Distance	Observed JT	Cumulative JT
1-2	170	48	48
2-3	600	60	108
3-4	150	12	120
4-5	230	24	144
5-6	690	96	240
6-7	420	60	**300**

SB

	Distance	Observed JT	Cumulative JT
1-2	420	46	46
2-3	690	162	208
3-4	230	23	231
4-5	150	23	254
5-6	600	92	346
6-7	170	46	**392**

Colindale Ave / Grahame Park Way

NB

	Distance	Observed JT	Cumulative JT
1-2	150	35	35
2-3	170	52	87
3-4	790	87	174
4-5	180	52	226
5-6	960	69	295
6-7	530	35	330
7-8	480	52	**382**

SB

	Distance	Observed JT	Cumulative JT
1-2	480	35	35
2-3	530	28	63
3-4	960	95	158
4-5	180	35	193
5-6	790	116	309
6-7	170	60	369
7-8	150	18	**387**

Watling Ave

EB

	Distance	Observed JT	Cumulative JT
1-2	430	103	103
2-3	480	41	144
3-4	840	91	**235**

WB

	Distance	Observed JT	Cumulative JT
1-2	840	82	82
2-3	480	58	140
3-4	430	95	**235**

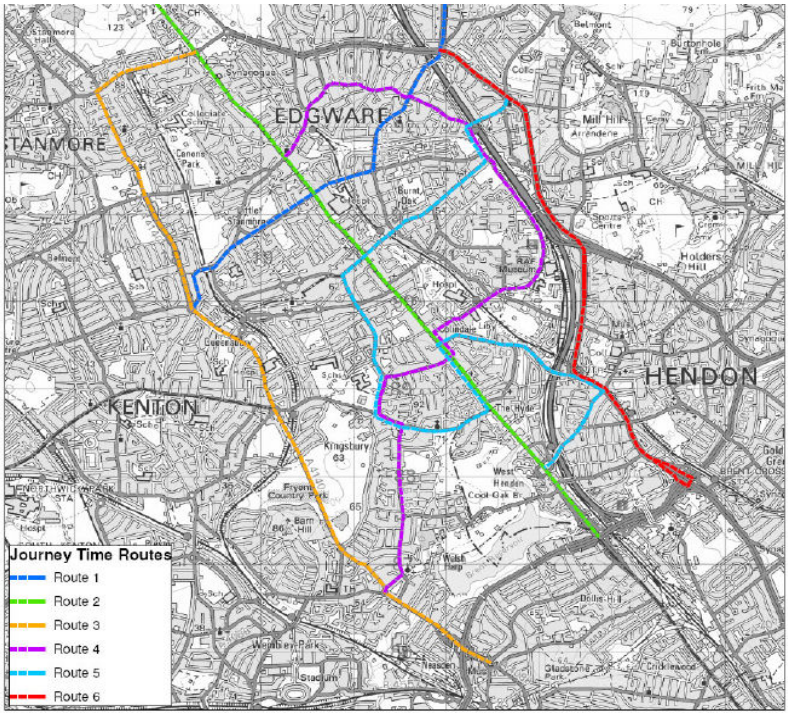
Colindeep Ln / Edgware Rd

EB

	Distance	Observed JT	Cumulative JT
1-2	100	12	12
2-3	800	62	74
3-4	150	41	115
4-5	700	74	189
5-6	600	49	**238**

WB

	Distance	Observed JT	Cumulative JT
1-2	830	49	49
2-3	700	74	123
3-4	150	41	164
4-5	800	82	246
5-6	100	49	**295**



Appendix D - Traffic Signal Information

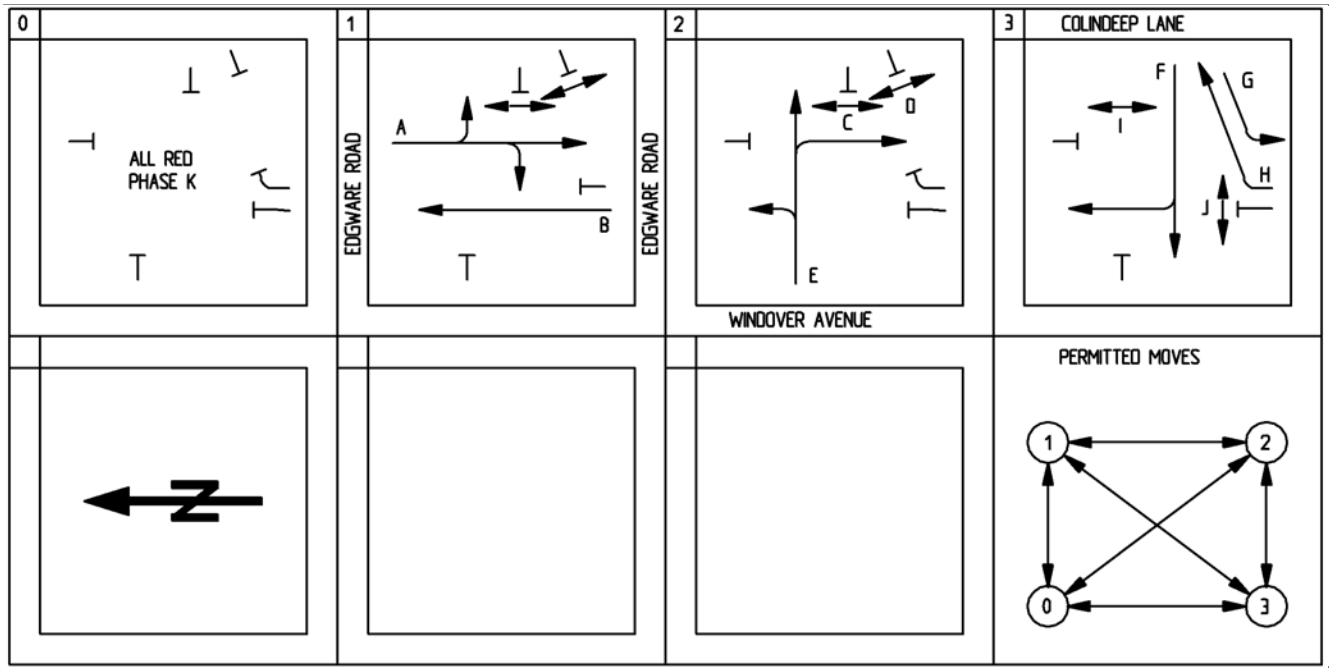
London Borough Of	Grid Reference	UTC Type	Bt Line No	Issue	Date Implemented	Initials	Site Number
BARNET	520922/189468		020 8205 7969	8	09-MAY-2007	FCC MLN	30/000103/M

Address

EDGWARE ROAD - COLINDEEP LANE - WINDOVER AVENUE

PDU Rate	Controller Installed Date	Engineer Responsible	Linking
120	20-FEB-1989		30/000089/M

Computer Takeover Date	Control Group	Control Subgroup	Concentrator Subgroup	Prom Number	Firmware	Controller Type
						Plessey T200 MK 2 Veh Controller



Unable to establish Issue No for Stage Diagram

TFL Drg No

Sig Drg No

HI Signal YES

Dimming 160 Volts

Issue	Site Number
8	30/000103/M

Phase Timings

Phase	Min	Ext	Max	Ped Black	Phase Type	Alternative Maximums					
A	7	.4	33		T	Alt.1	37	Alt.2	33	Alt.3	40
B	7	.4	33		T	Alt.1	37	Alt.2	33	Alt.3	40
C	7			3	P						
D	7			3	P						
E	7	.4	10		T	Alt.1	7	Alt.2	10	Alt.3	10
F	7	.4	16		T	Alt.1	17	Alt.2	20	Alt.3	18
G	7	.4	16		T	Alt.1	17	Alt.2	20	Alt.3	18
H	7	.4	16		T	Alt.1	17	Alt.2	20	Alt.3	18
I	7			3	P						
J	10			3	P						
K					D						

Phase Intergreens

To Phase

From Phase	A	B	C	D	E	F	G	H	I	J	K
A					7	8	8	8	6	8	
B					7	7	7	7		7	
C						7					
D							7	7			
E	7	7				7	8	8	7	7	
F	7	7	6		6						
G	7			6	6						
H	7			7	6						
I	7				7						
J	7	7			7						
K											

Mode Priority	
UTC	
Hand Control	
Manual Select	
Hurry (1)	
Hurry (2)	
VA	
CLF	
Fix Time	
Bus Priority	

CLF PLAN0		CLF PLAN1	
Time Of Operation	Day Type	Time Of Operation	Day Type
07:00	9	17:30	9
16:00	9		
18:00	9		
Cycle Time		Cycle Time	
87		88	

Issue	Site Number
8	30/000103/M

Phase Delays

Stage From	Stage To	Phase Associated	Delay Period
1	3	G	2
1	3	H	2
1	3	J	1
0	1	C	2
0	2	C	2
0	1	D	2
0	2	D	2
0	3	I	2
0	3	J	2

DET	Function	Phase
A MVD	CEX	A
B MVD	CEX	B
E MVD	CEX	E
E IRD	CEX	E
F MVD	CEX	F
F IRD	CEX	F
G MVD	CEX	G
H MVD	CEX	H
PB P18	CAL	C
PB P17	CAL	C
PB P 2	CAL	D
PB P 4	CAL	D
PB P15	CAL	I
PB P14	CAL	J
PB P 1	CAL	J
PB P 8	CAL	J
PB P7	CAL	J
BP A	CEX	B
BP B	CEX	B

Issue	Historical Amendments
8	EQUIPMENT AMENDED AS PER SITE VISIT. FCC MLN. 09-MAY-2007
7.1	BOTH BUS COUNTS INCREASED TO 10-5000 FC PDW 09-JAN-2003
7	OMU ON LINE FCC PVG 19-DEC-2002
6	PHASE TIMINGS EXT B,E,H CHANGED TO 0.4 IN RAM ONLY, SMVD AND IRDS INSTALLED, REPLACING SSD. 27-APR-2000 FCC RHB
5	BUS PRIORITY ENABLED. 29-MAR-2000 CDC DMC
4	NEW PROM INSTALLED FOR BUS PRIORITY, BUS LOOPS NOT YET COMMISSIONED. 13-MAR-2000 TOPS JWT ***** IMU TO BE RE-WORKED ******
3.5	EQUIPMENT LIST CORRECTED AFTER VISIT TO SITE. SIG AGU 17/9/97
3.4	OMU RELOADED FOR LMU EDI AB 1/10/93

Remarks

Version No	
Linking	CLF TO 30/89
Comments	TCSU SPEC ISSUE 2
Det Strategy	S'MVDS - PUSH BUTTONS - BUS LOOPS - IRDS
Amendment	EQUIPMENT AMENDED AS PER SITE VISIT. FCC MLN. 09-MAY-2007

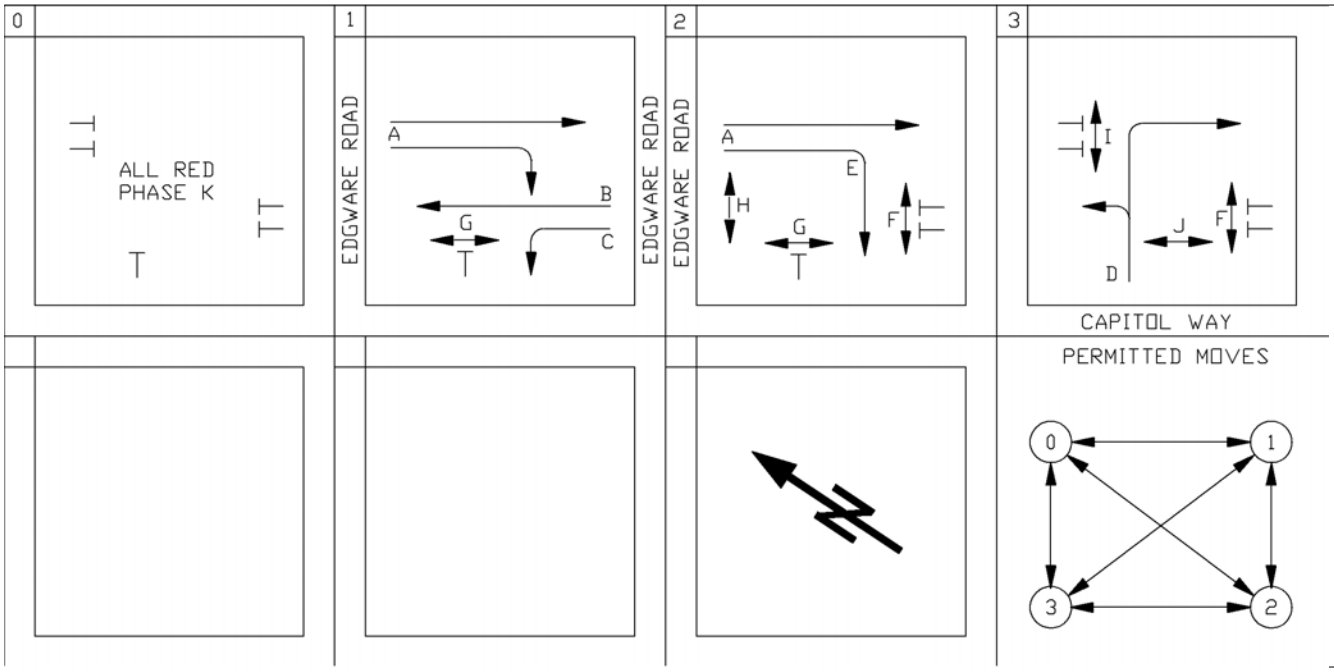
London Borough Of	Grid Reference	UTC Type	Bt Line No	Issue	Date Implemented	Initials	Site Number
BARNET	520580/189878		020 8205 9758	10	29-JAN-2009	CALLAWAYP	30/000098/M

Address

A5 EDGWARE ROAD - CAPITOL WAY

PDU Rate	Controller Installed Date	Engineer Responsible	Linking
68	13-FEB-2006	MOD JGH	

Computer Takeover Date	Control Group	Control Subgroup	Concentrator Subgroup	Prom Number	Firmware	Controller Type
						STCL T800 MK 1 Ctr, Integral Facilities



Stage Diagram for Issue No 7

TFL Drg No

Sig Drg No

HI Signal YES

Dimming 160 Volts

Issue	Site Number
10	30/000098/M

Phase Timings

Phase	Min	Ext	Max	Ped Black	Phase Type	Alternative Maximums					
A	7	.4	22		T	Alt.1	22	Alt.2	22	Alt.3	22
B	7	.4	22		T	Alt.1	22	Alt.2	22	Alt.3	22
C	7	.4	22		T	Alt.1	22	Alt.2	22	Alt.3	22
D	7	.4	9		T	Alt.1	9	Alt.2	9	Alt.3	9
E	4	1.6	9		F	Alt.1	9	Alt.2	9	Alt.3	9
F	5			3	P						
G	5			3	P						
H	5			3	P						
I	5			3	P						
J	5			3	D						
K	3				D						

Phase Intergreens

To Phase

From Phase	A	B	C	D	E	F	G	H	I	J	K
A				5					5	9	3
B				5	5	5		8			3
C				5	5	5		8			3
D	6	5	5		6		5	8			3
E		5	5	5					5	9	3
F		8	8								3
G				8							3
H		8	8	8							3
I	8				8						3
J	8				8						3
K	2	2	2	2	2	2	2	2	2	2	

Mode Proirity	
UTC	
Hand Control	
Manual Select	
Hurry (1)	
Hurry (2)	
VA	
CLF	
Fix Time	
Bus Priority	

MAX		ALT MAX1		ALT MAX2		ALT MAX3		ALT MAX4		ALT MAX5		ALT MAX6	
Time Of Operation	Day Type	Time Of Operation	Day Type	Time Of Operation	Day Type	Time Of Operation	Day Type	Time Of Operation	Day Type	Time Of Operation	Day Type	Time Of Operation	Day Type
07:30	9	12:00	9	16:00	9	19:30	7	09:30	9	14:00	9	10:00	0

Issue	Site Number
10	30/000098/M

Phase Delays

Stage From	Stage To	Phase Associated	Delay Period	Stage From	Stage To	Phase Associated	Delay Period	Stage From	Stage To	Phase Associated	Delay Period	Stage From	Stage To	Phase Associated	Delay Period
1	3	A	3	3	2	D	2								
1	3	B	3												
1	3	C	3												
2	3	A	1												
3	1	D	2												

DET	Function	Phase	DET	Function	Phase	DET	Function	Phase	DET	Function	Phase
AMVD	CEX	A	PB P3	CAL	F	PB P12	CAL	G	BBP	BUS	B
BMVD	CEX	B	PB P4	CAL	F	PB P13	CAL	H	DBP	BUS	D
BMVD	CEX	C	PB P5	CAL	F	PB P14	CAL	H	iABP		
EPL	CAL	E	PB P6	CAL	J	PB P15	CAL	H	iBBP		
EPL	CAN	E	PB P7	CAL	J	PB P16	CAL	I	iCBP		
CIRD	CEX	B	PB P8	CAL	J	PB P17	CAL	I	iDBP		
CIRD	CEX	C	PB P9	CAL	J	PB P18	CAL	I	iDBP		
DMVD	CEX	D	PB P10	CAL	G	A/EBP	BUS	E	iEBP		
DIRD	CAL	D	PB P11	CAL	G	A/EBP	BUS	A			

Issue	Historical Amendments
10	iBUS DETAILS LOADED FOR CONFIGURATION 29-JAN-2009 CALLAWAYP
9	IMU COMMISSIONED MODS JGH 20-JUL-2006
8	BUS BEACONS COMMISSIONED AND COUNTING LOCALLY. 30-JUN-06 TOPS KR
7.1	EQUIPMENT CORRECTED AS PER SITE VISIT. 18-MAY-06 DTA_BM
7	SITE MODERNISED - CONTROLLER, CABLE & ALL STREET FURNITURE REPLACED & COMMISSIONED. 13-FEB-06 MODS JGH **IMU AND BUS BEACONS STILL TO BE COMMISSIONED**
6	BUS COUNTS INCREADED FOR ALL3 LOOPS FCC PDW 31-AUG-2004
5	BUS PRIORITY COMMISSIONED. 16-MAY-2000 CDC DMC
4	NEW PROM INSTALLED FOR BUS PRIORITY, BP NOT YET COMMISSIONED. 09-APR-2000 TOPS JWT

Remarks

Version No	
Linking	NONE
Comments	TFL SPEC ISSUE 5
Det Strategy	SMVDs - IRDs - PRESENCE LOOP - PUSH BUTTONS / TACTILES - BUS BEACONS
Amendment	iBUS DETAILS LOADED FOR CONFIGURATION 29-JAN-2009 CALLAWAYP

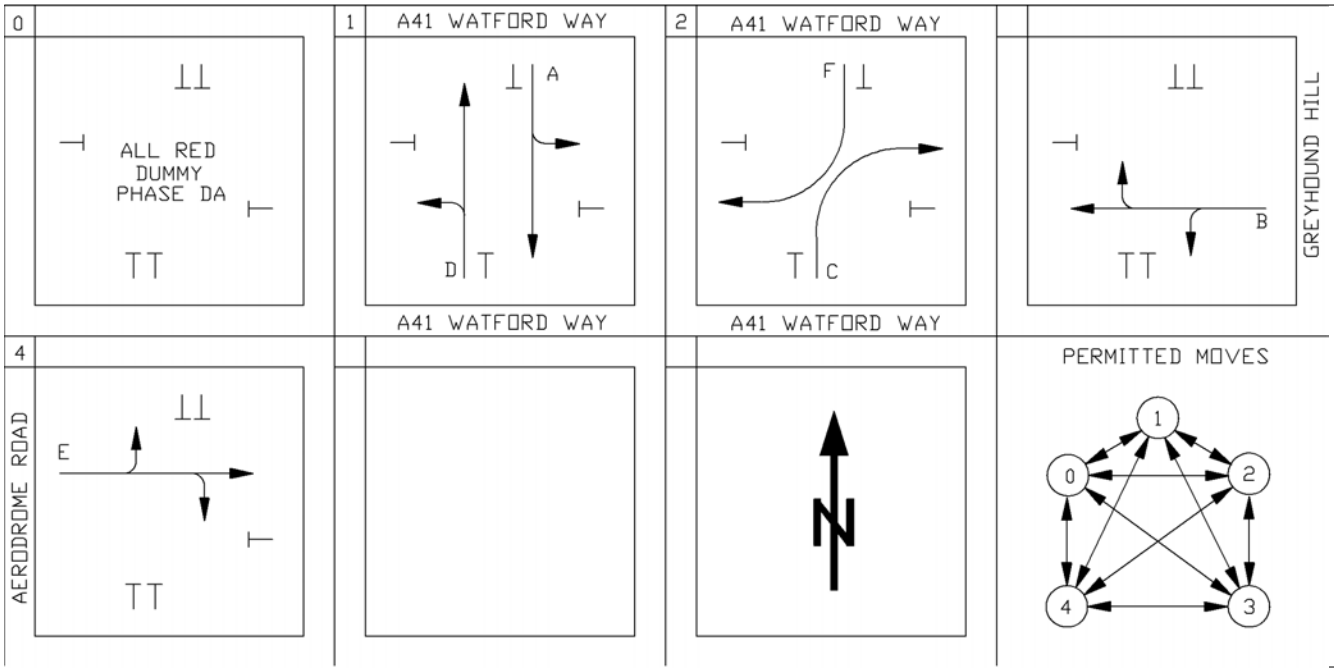
London Borough Of	Grid Reference	UTC Type	Bt Line No	Issue	Date Implemented	Initials	Site Number
BARNET	522416/189693			8	22-JUL-2008	MARSHD	30/000092/T

Address

A41 WATFORD WAY - GREYHOUND HILL - AERODROME ROAD

PDU Rate	Controller Installed Date	Engineer Responsible	Linking
60	09-MAR-1995	TM CAS	

Computer Takeover Date	Control Group	Control Subgroup	Concentrator Subgroup	Prom Number	Firmware	Controller Type
				CFG622 V4	C2409 001-	Microsense MTC Veh Controller



Stage Diagram for Issue No 8

TFL Drg No

Sig Drg No PRO/30/092/01

HI Signal YES

Dimming Volts

Issue	Site Number
8	30/000092/T

Phase Timings

Phase	Min	Ext	Max	Ped Black	Phase Type	Alternative Maximums					
A	7		42		T	Alt.1	52	Alt.2	52	Alt.3	52
B	7		12		T	Alt.1	12	Alt.2	12	Alt.3	12
C	5		15		T	Alt.1	15	Alt.2	15	Alt.3	15
D	7		42		T	Alt.1	52	Alt.2	52	Alt.3	52
E	7		12		T	Alt.1	12	Alt.2	12	Alt.3	12
F	5		15		T	Alt.1	15	Alt.2	15	Alt.3	15
DA	3				D						

Phase Intergreens

To Phase

From Phase	A	B	C	D	E	F	DA
A		8	8		5		3
B	5		5	6	8	8	3
C	7	7			7		3
D		5			7	7	3
E	7	9	7	5		5	3
F		7		7	7		3
DA	2	2	2	2	2	2	

Mode Priority	
UTC	
Hand Control	
Manual Select	
Hurry (1)	
Hurry (2)	
VA	
CLF	
Fix Time	
Bus Priority	

MAX		ALT MAX1		ALT MAX2		ALT MAX3		ALT MAX	
Time Of Operation	Day Type	Time Of Operation	Day Type	Time Of Operation	Day Type	Time Of Operation	Day Type	Time Of Operation	Day Type
09:30	9	07:00	9	16:00	9	07:00	0	00:00	7
18:30	7					07:00	1	12:00	7

Issue	Site Number
8	30/000092/T

Phase Delays

Stage From	Stage To	Phase Associated	Delay Period
1	3	D	3
1	4	A	2

DET	Function	Phase	DET	Function	Phase	DET	Function	Phase	DET	Function	Phase
DM1	EXT	D	BM10	EXT	B	EM19	EXT	E			
DM2	EXT	D	DM11	EXT	D	BM20	EXT	B			
DM3	EXT	D	DM12	EXT	D	BM21	EXT	B			
CM4	EXT	C	DM13	EXT	D	CM24	EXT	C			
AM5	EXT	A	CM14	EXT	C	FM28	EXT	F			
AM6	EXT	A	AM15	EXT	A	BM30	EXT	B			
AM7	EXT	A	AM16	EXT	A						
FM8	EXT	F	AM17	EXT	A						
EM9	EXT	E	FM18	EXT	F						

Issue	Historical Amendments
8.1	EQUIPMENT CORRECTED AFTER SITE VISIT 22-JUL-2008 MARSHD
8	NEW PROM (TFL SPEC ISSUE 3) INSTALLED & COMMISSIONED. 28-JUN-08 COWELLM
7.3	EQUIPMENT CORRECTED. 18-MAR-00 DTA_BM
7.2	MOVA UNIT ADDED TO THE EQUIPMENT LIST SIG PDW 17-MAR-00
7.1	BT LINE NUMBER CHANGED. SIG PDW 10-JAN-98
7	PHASE DETAILS PREVIOUSLY OMITTED, ADDED. 9-JAN-98 TO CAS
6	UNDER MOVA CONTROL. 11-SEP-95 TO CAS
5.1	BM10, UNI-DIRECTIONAL LOOP COMMISSIONED. 3-AUG-95 TO CAS
5	MOVA DETECTION COMMISSIONED, RUNNING VA. TO CAS 28-JUN-95

Remarks

Version No	
Linking	NONE
Comments	TFL SPEC ISSUE 3. MOVA LINE NO. 020 8203 9015. MOVA TIME SET: 1 - 00:00:00 ALL WEEK, 2 - 12:00:00 ALL WEEK.
Det Strategy	MOVA
Amendment	EQUIPMENT CORRECTED AFTER SITE VISIT 22-JUL-2008 MARSHD

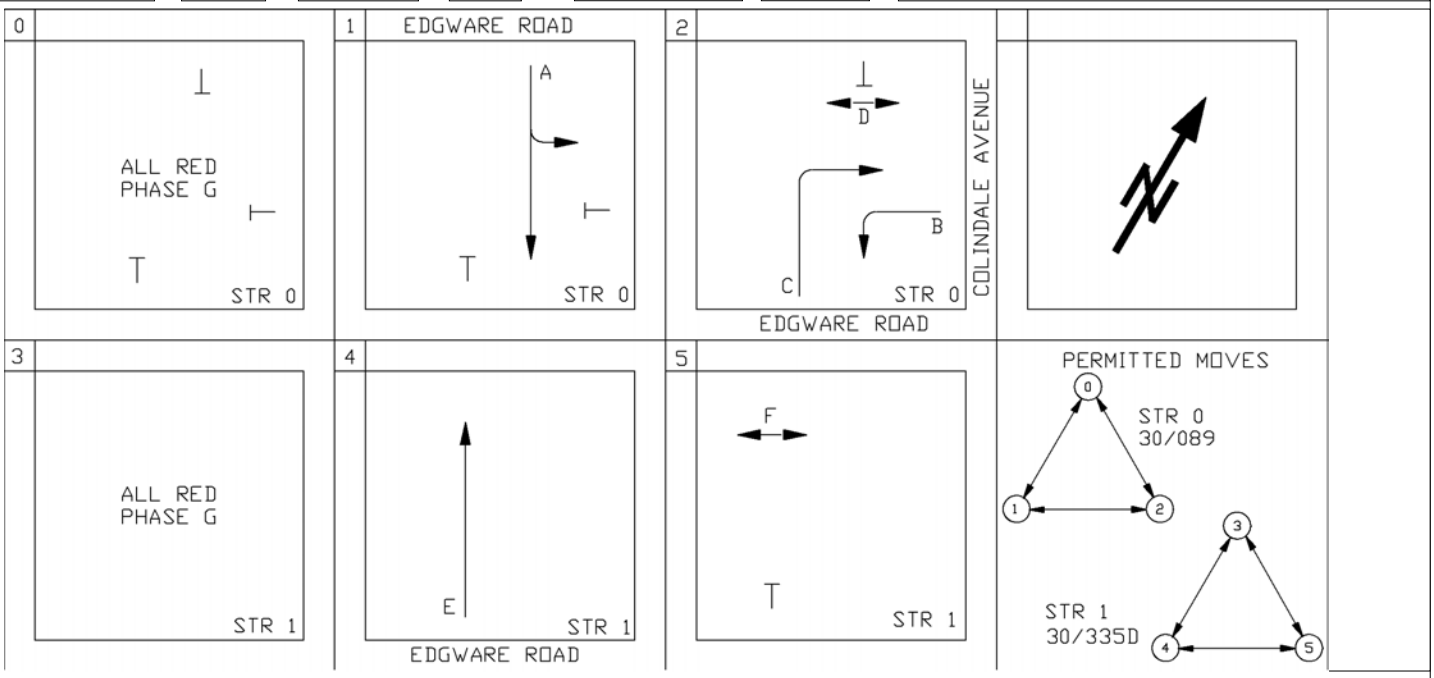
London Borough Of	Grid Reference	UTC Type	Bt Line No	Issue	Date Implemented	Initials	Site Number
BARNET	520803/189581		020 8358 3637	17	24-OCT-2008	WILTSHIRER	30/000089/M

Address

EDGWARE ROAD - COLINDALE AVENUE

PDU Rate	Controller Installed Date	Engineer Responsible	Linking
68	02-MAY-2008	WILTSHIRE	30/000103/M

Computer Takeover Date	Control Group	Control Subgroup	Concentrator Subgroup	Prom Number	Firmware	Controller Type
				EM67552 V1	PB800-24	STCL T800 MK 1 Ctr, Integral Facilities



Stage Diagram for Issue No 16

TFL Drg No

Sig Drg No PRO/30/089/02A

HI Signal YES

Dimming 160 Volts

Issue	Site Number
17	30/000089/M

Phase Timings

Phase	Min	Ext	Max	Ped Black	Phase Type	Alternative Maximums					
A	7	.4	32		T	Alt.1	32	Alt.2	32	Alt.3	32
B	7	.4	30		T	Alt.1	30	Alt.2	30	Alt.3	30
C	7	.4	20		T	Alt.1	20	Alt.2	20	Alt.3	20
D	5			3	P						
E	7	.4	30		T	Alt.1	30	Alt.2	30	Alt.3	30
F	5			3	P						
G	3				D						
H	3				D						

Phase Intergreens

To Phase

From Phase	A	B	C	D	E	F	G	H
A		5	5	5			3	
B	5						3	
C	5						3	
D	8						3	
E						5		3
F					8			3
G	2	2	2	2				
H					2	2		

Mode Proirity	
UTC	
Hand Control	
Manual Select	
Hurry (1)	
Hurry (2)	
VA	
CLF	
Fix Time	
Bus Priority	

CLF PLAN1		CLF PLAN2	
Time Of Operation	Day Type	Time Of Operation	Day Type
07:00	9	17:30	9
16:00	9		
18:15	9		
Cycle Time		Cycle Time	
87		88	

Issue	Site Number
17	30/000089/M

Phase Delays

Stage From	Stage To	Phase Associated	Delay Period
2	1	B	3
2	1	C	3

DET	Function	Phase
AMVD7	CEX	A
BMVD8	CEX	B
CMVD6	CEX	C
EMVD1	EXT	E
BIRD 8	CEX	B
PB P1	CAL	F
PB P2	CAL	F
PB P3	CAL	F
PB P4	CAL	D
PB P5	CAL	D
PB P7	CAL	D
ABP	CAL	A
BBP	CAL	B
CBP	CAL	C

Issue	Historical Amendments
17	IMU COMMISSIONED. 24-OCT-08 WILTSHIRER (FCC PC)
16.1	EQUIPMENT & SNAGGING CORRECTED AS PER SITE VISIT. 17-JUN-08 DTA_BM
16	SITE MODERNISED - CONTROLLER, CABLE & ALL STREET FURNITURE REPLACED & COMMISSIONED. 02-MAY-08 WILTSHIRER **SNAGGING OUTSTANDING**
15	OMU BACK ON LINE J GILMORE 16-AUG-2007
14	EQUIPMENT AMENDED. ERROR CORRECTED. FCC MLN. 29-MAY-2007
13	EQUIPMENT AMENDED AS PER SITE VISIT. FCC MLN. 09-MAY-2007
12	BUS COUNTS INCREASED FCC PDW 06-OCT-2004
11	OMU ON LINE FCC PVG 05-OCT-2004

Remarks

Version No	4
Linking	CLF TO 30/103
Comments	TFL SPEC ISSUE 4 **Outstanding Snagging**
Det Strategy	SMVDs - IRDs - PUSH BUTTONS / TACTILES
Amendment	IMU COMMISSIONED. 24-OCT-08 WILTSHIRER (FCC PC)

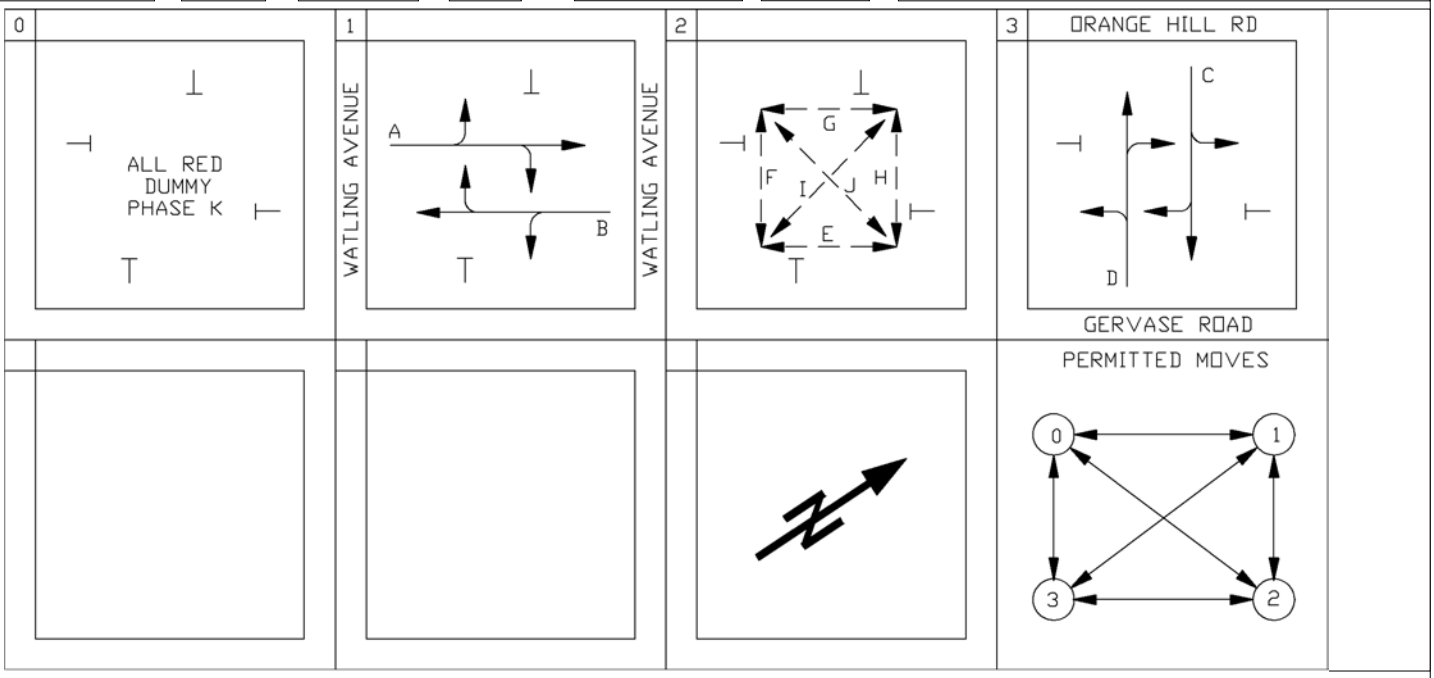
London Borough Of	Grid Reference	UTC Type	Bt Line No	Issue	Date Implemented	Initials	Site Number
BARNET	520414/190806		020 8201 1382	19	09-NOV-2008	WARNERD	30/000033/M

Address

WATLING AVENUE - GERVASE ROAD - ORANGE HILL ROAD

PDU Rate	Controller Installed Date	Engineer Responsible	Linking
68	27-JUN-2007	BOR RSF	

Computer Takeover Date	Control Group	Control Subgroup	Concentrator Subgroup	Prom Number	Firmware	Controller Type
				EM65154 V4	PB800-24	STCL T800 MK 1 Ctr, Integral Facilities



Stage Diagram for Issue No 14

TFL Drg No

Sig Drg No PRO/30/033/03

HI Signal YES

Dimming 160 Volts

Issue	Site Number
19	30/000033/M

Phase Timings

Phase	Min	Ext	Max	Ped Black	Phase Type	Alternative Maximums					
A	7	.4	29		T	Alt.1	18	Alt.2	33	Alt.3	15
B	7	.4	29		T	Alt.1	18	Alt.2	33	Alt.3	15
C	7	.4	21		T	Alt.1	12	Alt.2	27	Alt.3	10
D	7	.4	21		T	Alt.1	12	Alt.2	27	Alt.3	10
E	5			3	P						
F	5			5	P						
G	5			4	P						
H	5			5	P						
I	10			10	P						
J	10			10	P						
K	3				D						

Phase Intergreens

To Phase

From Phase	A	B	C	D	E	F	G	H	I	J	K
A			5	5	8	5	8	8	8	8	3
B			5	5	7	8	9	5	8	8	3
C	5	5			8	9	5	8	8	8	3
D	5	5			5	8	8	8	8	8	3
E	8	8	8	8							3
F	11	11	11	11							5
G	10	10	10	10							4
H	12	12	12	12							5
I	19	19	19	19							10
J	19	19	19	19							10
K	2	2	2	2	2	2	2	2	2	2	

Mode Proirity	
UTC	
Hand Control	
Manual Select	
Hurry (1)	
Hurry (2)	
VA	
CLF	
Fix Time	
Bus Priority	

MAX		ALT MAX1		ALT MAX2		ALT MAX3	
Time Of Operation	Day Type	Time Of Operation	Day Type	Time Of Operation	Day Type	Time Of Operation	Day Type
07:00	9	09:45	9	16:00	9	21:00	7
11:30	9	12:00	9				
		19:00	9				
		08:00	0				
		10:00	1				

Issue	Site Number
19	30/000033/M

Phase Delays

Stage From	Stage To	Phase Associated	Delay Period

Stage From	Stage To	Phase Associated	Delay Period

Stage From	Stage To	Phase Associated	Delay Period

Stage From	Stage To	Phase Associated	Delay Period

DET	Function	Phase
AMVD9	CEX	A
BMVD3	CEX	B
CMVD12	CEX	C
DMVD6	CEX	D
PB P5	CAL	E
PB P6	CAL	E
PB P8	CAL	F
PB P9	CAL	F
PB P11	CAL	G

DET	Function	Phase
PB P12	CAL	G
PB P2	CAL	H
PB P3	CAL	H
PB P1	CAL	I
PB P7	CAL	I
PB P4	CAL	J
PB P10	CAL	J
ABP	CEX	A
BBP	CEX	B

DET	Function	Phase
CBP	CEX	C
iABP	BUS	A
iABP	BUS	A
iBBP	BUS	B
iCBP	BUS	C

DET	Function	Phase

Issue	Historical Amendments
19.1	GEMINI UNIT REPLACED - EQUIPMENT LIST UPDATED. iBUS IMU LINE SHARE ALL COMPLETE 09-NOV-2008 WARNERD
19	IMU LINE SHARE COMPLETE 12-OCT-2008 VANGELDERP
18	iBUS DETECTION EQUIPMENT INSTALLED & COMMISSIONED LOCALLY. 01-AUG-08 EDGHILLD
17	iBUS DETAILS LOADED FOR CONFIGURATION 21-JUL-2008 HEADJ
16.1	EQUIPMENT CORRECTED AS PER SITE VISIT. 25-APR-08 DTA_BM
16	BUS PRIORITY COMMISSIONED. 13-SEP-07 BOR RSF
15.1	BP LINE NO. ADDED. 23-JUL-07 BOR RSF
15	IMU COMMISSIONED 18-JUL-2007 BOR RSF
14	SITE MODERNISED - CONTROLLER, CABLE & EQUIPMENT REPLACED & COMMISSIONED. 27-JUN-07 BOR RSF **IMU STILL TO BE

Remarks

Version No	
Linking	NONE
Comments	TFL SPEC ISSUE 6. BP LINE NO. 020 8959 8918.
Det Strategy	SMVDs - PUSH BUTTONS / TACTILES - BUS BEACONS - iBUS
Amendment	GEMINI UNIT REPLACED - EQUIPMENT LIST UPDATED. iBUS IMU LINE SHARE ALL COMPLETE 09-NOV-2008 WARNERD

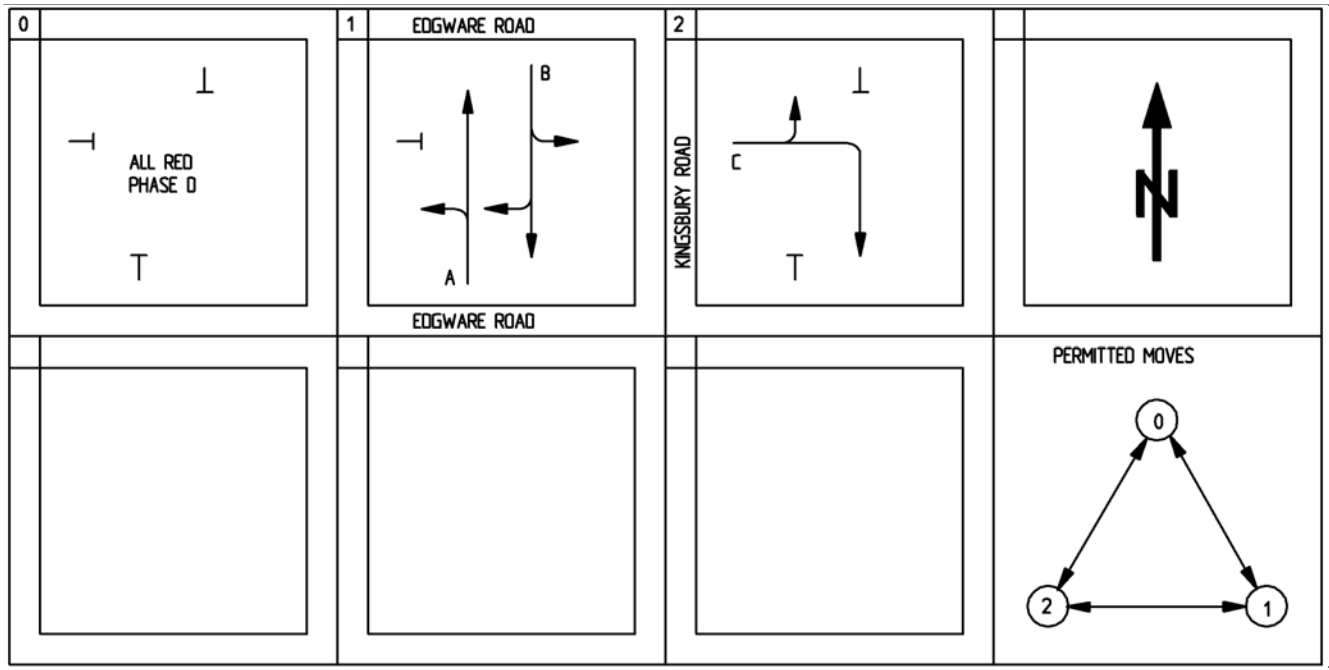
London Borough Of	Grid Reference	UTC Type	Bt Line No	Issue	Date Implemented	Initials	Site Number
BARNET	521462/188731		020 8200 4648	17	03-FEB-2009	CALLAWAYP	30/000005/M

Address

EDGWARE ROAD - KINGSBURY ROAD - ROOKERY WAY

PDU Rate	Controller Installed Date	Engineer Responsible	Linking
75	13-FEB-2001	MOD GM	

Computer Takeover Date	Control Group	Control Subgroup	Concentrator Subgroup	Prom Number	Firmware	Controller Type
				EM 28068 003	3.22	STCL T400 MK 1 Ctr with Integral Facs



Unable to establish Issue No for Stage Diagram

TFL Drg No

Sig Drg No

HI Signal YES

Dimming 160 Volts

Issue	Site Number
17	30/000005/M

Phase Timings

Phase	Min	Ext	Max	Ped Black	Phase Type	Alternative Maximums					
A	7	.4	32		T	Alt.1	32	Alt.2	32	Alt.3	32
B	7	.4	32		T	Alt.1	32	Alt.2	32	Alt.3	32
C	7	.4	24		T	Alt.1	24	Alt.2	24	Alt.3	24
D	3				D						

Phase Intergreens

To Phase

From Phase	A	B	C	D
A			8	3
B			8	3
C	5	5		3
D	2	2	2	

Mode Proirity	
UTC	
Hand Control	
Manual Select	
Hurry (1)	
Hurry (2)	
VA	
CLF	
Fix Time	
Bus Priority	

MAX		ALT MAX1		ALT MAX2		ALT MAX3	
Time Of Operation	Day Type	Time Of Operation	Day Type	Time Of Operation	Day Type	Time Of Operation	Day Type
09:30	7	07:30	7	12:00	7	16:00	7
14:00	7						
19:30	7						

Issue	Site Number
17	30/000005/M

Phase Delays

Stage From	Stage To	Phase Associated	Delay Period	Stage From	Stage To	Phase Associated	Delay Period	Stage From	Stage To	Phase Associated	Delay Period	Stage From	Stage To	Phase Associated	Delay Period

DET	Function	Phase	DET	Function	Phase	DET	Function	Phase	DET	Function	Phase
AMVD	CEX	A									
BMVD	CEX	B									
CMVD	CEX	C									
iABP	BUS	A									
iBBP	BUS	B									
iCBP	BUS	C									
iABP	BUS	A									

Issue	Historical Amendments
17	STOP CONDITION TYPE CORRECTED 03-FEB-2009 CALLAWAYP
16	IMU LINE SHARE COMPLETE 12-OCT-2008 VANGELDERP
15	iBUS ROUTE INFORMATION UPDATED. 02-OCT-08 CALLAWAYP
14	PARAMETERS CORRECTED. EDGHILL D. 05-DEC-2007
13	iBUS DETECTION EQUIPMENT INSTALLED & COMMISIONED. EDGHILL D. 06-NOV-2007
12.2	IBUS DATA ENTRY
12.1	BUS COUNTS FOR B PHASE DET INCREASED FCC PDW 01-SEP-2004
12	BUS COUNTS INCREASED FOR BP A AND C LOOPS FCC PDW 31-AUG-2004
11	IMU ON LINE. 05-JUL-04 FCC PVG

Remarks

Version No	
Linking	NONE
Comments	TCSU SPEC ISSUE 12
Det Strategy	SMVDs - iBUS
Amendment	STOP CONDITION TYPE CORRECTED 03-FEB-2009 CALLAWAYP

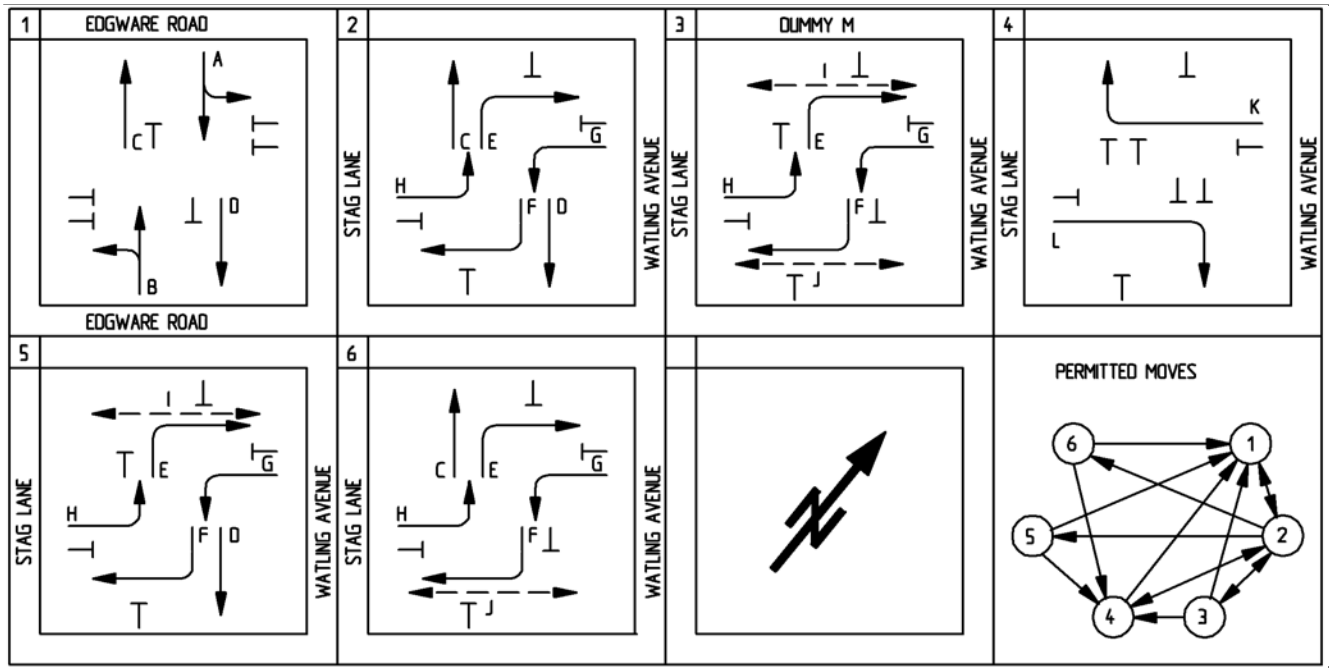
London Borough Of	Grid Reference	UTC Type	Bt Line No	Issue	Date Implemented	Initials	Site Number
BARNET	520100/190497		020 8951 1033	12	21-JUL-2008	HEADJ	30/000002/M

Address

BURNT OAK BROADWAY - WATLING AVENUE - STAG LANE - EDGWARE ROAD

PDU Rate	Controller Installed Date	Engineer Responsible	Linking
120	30-OCT-1992		

Computer Takeover Date	Control Group	Control Subgroup	Concentrator Subgroup	Prom Number	Firmware	Controller Type
						Plessey T200 MK 2 Veh Controller



Unable to establish Issue No for Stage Diagram

TFL Drg No

Sig Drg No TD/HT/0/30/2/S/1053

HI Signal YES

Dimming 160 Volts

Issue	Site Number
12	30/000002/M

Phase Timings

Phase	Min	Ext	Max	Ped Black	Phase Type	Alternative Maximums					
A	7	.4	36		T	Alt.1	36	Alt.2	36	Alt.3	36
B	7	.4	36		T	Alt.1	36	Alt.2	36	Alt.3	36
C	7				T						
D	7				T						
E	7	.4	20		T	Alt.1	20	Alt.2	20	Alt.3	20
F	7	.4	20		T	Alt.1	20	Alt.2	20	Alt.3	20
G	10	.4	16		T	Alt.1	20	Alt.2	16	Alt.3	20
H	10	.4	20		T	Alt.1	20	Alt.2	20	Alt.3	20
I	12			3	P						
J	12			3	P						
K	10	.4	14		T	Alt.1	14	Alt.2	14	Alt.3	16
L	10	.4	14		T	Alt.1	16	Alt.2	14	Alt.3	16
M	10				D						
N	3				D						

Phase Intergreens

To Phase

From Phase	A	B	C	D	E	F	G	H	I	J	K	L	M	N
A					5		5		5		5		5	3
B						5		5		5		5	5	3
C									5		5			3
D										5		5		3
E	5										7			3
F		5										7		3
G	5													3
H		5												3
I	7		7								7		7	3
J		7		7								7	7	3
K	6		6		6		6		7				7	3
L		6		6		6		6		7			7	3
M	5	5							5	5	5	5		3
N									2	2				

Mode Proirity	
UTC	
Hand Control	
Manual Select	
Hurry (1)	
Hurry (2)	
VA	
CLF	
Fix Time	
Bus Priority	

MAX		ALT MAX1		ALT MAX3	
Time Of Operation	Day Type	Time Of Operation	Day Type	Time Of Operation	Day Type
09:30	9	07:00	9	16:00	9
19:00	7				

Issue	Site Number
12	30/000002/M

Phase Delays

Stage From	Stage To	Phase Associated	Delay Period

Stage From	Stage To	Phase Associated	Delay Period

Stage From	Stage To	Phase Associated	Delay Period

Stage From	Stage To	Phase Associated	Delay Period

DET	Function	Phase
SMVDB2	CAL	B
SMVDA1	CEX	A
SMVDA2	CEX	A
SMVDB1	CAL	B
SMVDC	CEX	C
SMVDD	CEX	D
SMVDE	CEX	E
SMVDF	CEX	F
SMVDG	CEX	G

DET	Function	Phase
SMVDH	CEX	H
SMVDK	CEX	K
SMVDL	CEX	L
PB P4	CAL	I
PB P7	CAL	I
PB P14	CAL	J
PB P17	CAL	J
A1	CEX	A
B1	CEX	B

DET	Function	Phase
H1	CEX	H
K1	CEX	K
iABP		
iABP		
iABP		
iBBP		
iGBP		
iHBP		
iHBP		

DET	Function	Phase
iKBP		

Issue	Historical Amendments
12	IBUS DETAILS LOADED FOR CONFIGURATION 21-JUL-2008 HEADJ
11.1	OMU RECONFIGURED AS CH13 FAULTY FCC PDW 18-MAR-2004
11	OMU ON LINE FCC PVG 16-MAR-2004
10	PHASE TIMINGS 'EXT' CHANGED IN RAM ONLY TO 0.4 SEC., S'MVDS INSTALLED, REPLACING SSD & SINGLE LOOPS. 27-FEB-2000 FCC RHB
9	BP COMMISSIONED, V/A TIMINGS REVIEWED AND HEADER CODES ENABLED. 12-AUG-94 TM CAS
8.1	OMU REWORKED FOR BP LOOPS. SIG PDW 3-FEB-94
8	NEW PROM INSTALLED FOR BUS PRIORITY. 26-OCT-93 GEC LR.
7.2	KNOCKDOWN NEW OMU INSTALLED SIG PDW 30/9/93

Remarks

Version No	
Linking	NONE
Comments	
Det Strategy	S'MVDS - PUSH BUTTONS - BUS PRIORITY
Amendment	IBUS DETAILS LOADED FOR CONFIGURATION 21-JUL-2008 HEADJ

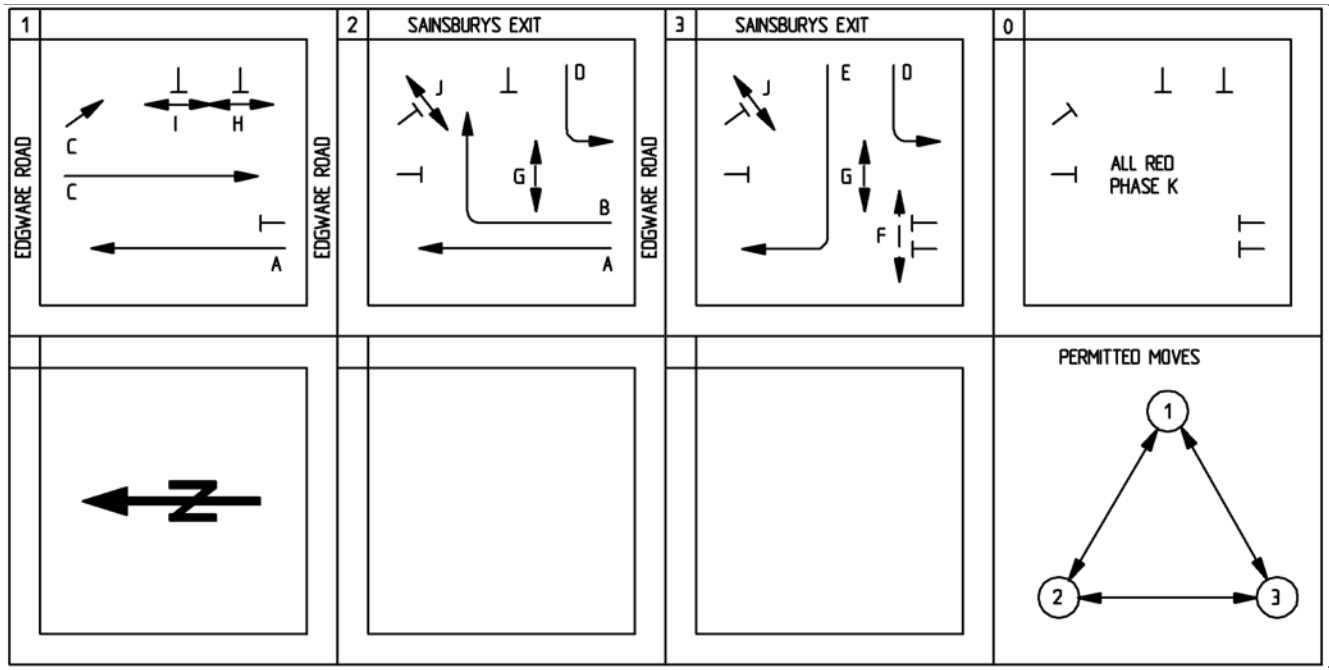
London Borough Of	Grid Reference	UTC Type	Bt Line No	Issue	Date Implemented	Initials	Site Number
BARNET	521633/188544		020 8201 3109	9	02-OCT-2008	CALLAWAYP	30/000135/M

Address

A5 EDGWARE ROAD - HYDE ESTATE ROAD - SAINSBURYS ACCESS

PDU Rate	Controller Installed Date	Engineer Responsible	Linking
75	25-APR-1993		

Computer Takeover Date	Control Group	Control Subgroup	Concentrator Subgroup	Prom Number	Firmware	Controller Type
						STCL T400 MK 1 Veh Controller



Unable to establish Issue No for Stage Diagram

TFL Drg No

Sig Drg No SIG/30/135/L/1186

HI Signal YES

Dimming 160 Volts

Issue	Site Number
9	30/000135/M

Phase Timings

Phase	Min	Ext	Max	Ped Black	Phase Type	Alternative Maximums					
A	7	.4	30		T	Alt.1	20	Alt.2	30	Alt.3	30
B	7	.4	8		T	Alt.1	8	Alt.2	8	Alt.3	8
C	7	.4	30		T	Alt.1	50	Alt.2	30	Alt.3	30
D	7	.4	8		T	Alt.1	8	Alt.2	8	Alt.3	8
E	7	.4	8		T	Alt.1	8	Alt.2	8	Alt.3	8
F	5			3	P						
G	5			3	P						
H	5			3	P						
I	5			3	P						
J	5			3	P						
K	3				D						

Phase Intergreens

To Phase

From Phase	A	B	C	D	E	F	G	H	I	J	K
A					6	5					3
B			6		6	5			6		3
C		6		7	6		6			5	3
D			5					5			3
E	6	6	5						5		3
F	8	8									3
G			8								3
H				8							3
I		10			10						3
J			8								3
K						2	2	2	2	2	

Mode Priority	
UTC	
Hand Control	
Manual Select	
Hurry (1)	
Hurry (2)	
VA	
CLF	
Fix Time	
Bus Priority	

CLF PLAN1	
Time Of Operation	Day Type
07:00	9

Cycle Time
60

Issue	Site Number
9	30/000135/M

Phase Delays

Stage From	Stage To	Phase Associated	Delay Period

Stage From	Stage To	Phase Associated	Delay Period

Stage From	Stage To	Phase Associated	Delay Period

Stage From	Stage To	Phase Associated	Delay Period

DET	Function	Phase
S'MVDA A	CEX	A
N'MVDB E	CEX	B
IRDC	CAL	C
SMVDC1 A	CEX	C
SMVDC2 A	CAL	C
N'MVDD S	CEX	D
SMVDE SA	CEX	E
PB P13	CAL	F
PB P15	CAL	F

DET	Function	Phase
PB P11	CAL	G
PB P12	CAL	G
PB P9	CAL	H
PB P10	CAL	H
PB P4	CAL	I
PB P7	CAL	I
PB P8	CAL	I
PB P5	CAL	J
PB P6	CAL	J

DET	Function	Phase
iABP	BUS	A
iCBP	BUS	C

DET	Function	Phase

Issue	Historical Amendments
9	iBUS ROUTE INFORMATION UPDATED. 02-OCT-08 CALLAWAYP
8	iBUS DETECTION EQUIPMENT INSTALLED & COMMISSIONED. EDGHILL D. 31-OCT-2007
7.1	IBUS DATA ENTRY
7	EQUIPMENT CORRECTED AS PER SITE SURVEY VISIT 07-FEB-2007 SAJNANIS
6.1	POLE & MVD DETAILS AMENDED AS PER SITE VISIT. 09-OCT-03 FCC MGC
6	PHASE TIMINGS 'EXT' CHANGED TO 0.4 SEC IN RAM, S'MVDS, N'MVDS & IRD INSTALLED. 29-JAN-2002 FCC RHB
5	BUS PRIORITY IMPLEMENTED. 01-APR-2000 TOPS RXB
4	BUS PRIORITY EQUIPMENT COMMISSIONED. 01-APR-2000 TOPS DTE
3	BUS PRIORITY DETAILS REMOVED. 21-JUN-95 TOPS DC

Remarks

Version No	
Linking	NONE
Comments	
Det Strategy	SMVDs - NMVDs - IRD - PUSH BUTTONS - iBUS
Amendment	iBUS ROUTE INFORMATION UPDATED. 02-OCT-08 CALLAWAYP

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