

Hyde Park Hayes

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Transport Assessment

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1 Introduction

1.1 Background

- 1.1.1 SKM Colin Buchanan (SKM CB) has been appointed by Hyde Park Hayes Ltd to provide transport consultancy services in support of the detailed planning applications on the Hyde Park Hayes (HPH) 5 site at Hyde Park Hayes, London Borough of Hillingdon (LBH).
- 1.1.2 The location of the application site is shown in Figure 1.1. The HPH 5 scheme is a 13,880 sqm GFA B1 office development with 140 associated car park spaces. It should be noted that an outline planning application for HPH 5 was submitted in February 2008 and was subsequently approved in May 2008. It should be noted that the LPA is considering a renewal of this application. The new application is identical in scale to the previous outline consent and as such this report also effectively supports the renewal of this outline consent.
- 1.1.3 Hyde Park Hayes Ltd is also to submit a detailed planning application for HPH 4. The HPH 4 scheme is a 6,964 sqm GFA B1 office building with 72 associated car park spaces and its location is also shown in Figure 1.1. The cumulative impact of both HPH 4 and HPH 5 are considered in this assessment
- 1.1.4 HPH is a 10-acre business park that currently includes three office buildings:
- HPH 1 The White House is three-storey building consisting of circa 9,000 sqm of Net Internal Area (NIA).
 - HPH 2 is a two-storey building consisting of circa 6,000 sqm NIA.
 - HPH3 The Suite Factory consisting of circa 5,000 sqm NIA.
- 1.1.5 Hayes is strategically located 13 miles west of central London and three miles from Heathrow Airport, with rapid access to local, national and international travel networks.
- 1.1.6 This TA report reflects the pre-application discussions with LBH Highways, and assesses the transport impact of the proposed office development to determine whether the scale of development can be accommodated within the existing transport infrastructure. A Scoping Report was submitted to LBH Highways is included in Appendix A, along with further correspondence on the scope of the TA.
- 1.1.7 The assessment methodology used will be based upon the guidance set out in the Transport for London (TfL) Transport Assessment – Best Practice Guidance document published in 2010 and in the Department for Transport (DfT) guidance for the preparation of Transport Assessments.

1.2 Structure of this Report

- 1.2.1 Following this introductory chapter, this report is structured as follows:
- Section 2 provides a comprehensive description of the existing highway, pedestrian and cycling conditions in the surrounding area;

- Section 3 summarises the relevant national, regional and local policies where they relate to the proposed development;
- Section 4 sets out the quantum of development, level of on-site parking provision and delivery and servicing arrangements;
- Section 5 sets out the methodology used in deriving the trip generation, the modal split and the distribution used in this assessment;
- Section 6 summaries the modelling approach and flow scenarios assessed;
- Section 7 assesses the impact of the development on the highway network;
- Section 8 identifies measures to mitigate the impact of traffic;
- Section 9 details the impact on non-car modes from the development; and
- Section 10 summarises the key findings and concludes the report.

2 Existing Situation

2.1 Introduction

- 2.1.1 In order to assess the impact of the development proposals on the transport network within the vicinity of the site, it is necessary to establish the existing transport conditions. This section, therefore, describes the current highway network and provides information on relevant public transport infrastructure and pedestrian and cycle facilities.

2.2 Application Site

- 2.2.1 The HPH 5 site is located close to the centre of the site on the south of the HPH park and will be accessible directly from the central piazza.

2.3 Highways

- 2.3.1 The highway network within the vicinity of the development is shown in Figure 2.1. The site has excellent road links, with the M4 approximately 1 kilometre to the south and the A40 approximately 5 kilometres to the north, both readily accessed via North Hyde Road and The Parkway. Heathrow Airport and the M25 are both within 5 kilometres of the development.
- 2.3.2 The A437, Station Road, bounds the HPH campus to the east and forms a signalised junction with North Hyde Road at the north eastern corner of HPH. The four-arm signalised junction includes formal pedestrian crossing and cycle facilities. The eastern end of North Hyde Road leads to the A312 The Parkway, which connects to Junction 3 of the M4 to the south and A40 to the north. The western end of North Hyde Road forms a five-arm roundabout with Dawley Road.
- 2.3.3 HPH can be accessed via the three existing vehicular accesses, which are:
- Millington Road/Station Road junction;
 - North Hyde Road/Millington Road West junction; and
 - A437/North Hyde Road/Dawley Road/Millington Road/ Bourne Avenue junction (5-arm Roundabout).

2.4 Traffic Survey Data

- 2.4.1 The extent of this document's 'study area' and the timing and location of traffic surveys are in-line with LBH Highways pre-application advice (refer to Appendix B).
- 2.4.2 Classified turning count surveys along with queue, saturation flow and green time surveys at signalised junction were undertaken on 14th March 2012 to establish the existing traffic flows for the following junctions:
- Millington Road/Station Road junction;
 - North Hyde Road/Station Road junction (4-arm signals junction);
 - North Hyde Road/Millington Road West junction; and

- A437/North Hyde Road/Dawley Road/Millington Road/ Bourne Avenue junction (5-arm Roundabout).

2.4.3 Classified turning count surveys along with queue, saturation flow and green time surveys at signalised junction were undertaken on 12th June 2012 to establish the existing traffic flows for the following junctions:

- Station Road/Dawley Road/Shepiston Lane roundabout
- High Street/Station Road junction traffic signals; and
- North Hyde Gardens/North Hyde Road/Watersplash Lane traffic signals.

2.4.4 Classified turning count surveys along with queue, saturation flow and green time surveys at signalised junction were undertaken on 19th June 2012 to establish the exiting traffic flows for the following junctions:

- North Hyde Road / Hayes Bypass / Hayes Road signalised roundabout; and
- Dawley Road / Blyth Road/ Betam Road / Kestral Way Roundabout.

2.4.5 The AM and PM peak surveyed traffic flows are summarised in Figure 2.2 and Figure 2.3.

2.5 Baseline Capacity Assessments

2.5.1 Industry standard software (PICADY, ARCADY, TRANSYT and LINSIG) have been used to test the performance of the nine surveyed junctions under the existing observed traffic flows. The results of these tests are included in Appendix C and are summarised in Table 2.1 to Table 2.9.

Table 2.1 ARCADY Results – Dawley Road/Blyth Road/Kestral Way/Betam Road Roundabout – Existing

ARM	AM Peak			PM Peak		
	RFC	Queue	Observed Queue	RFC	Queue	Observed Queue
Dawley Road (N)	0.648	2	1	0.446	1	0
Blyth Road	0.748	3	3.5	0.697	2	3.25
Dawley Road (S)	0.723	3	0	0.672	2	0
Kestral Way	0.083	0	0	0.218	0	0
Betam Road	0.054	0	0	0.121	0	0

2.5.2 For the priority and roundabout junctions the practical upper limit RFC is 0.85 (85%), whereas for traffic signal junctions the practical upper limit degree of saturation is 90%. It can be seen from Table 2.1 that the existing roundabout operates within capacity under existing traffic flows.

2.5.3 It should be noted from the Table 2.1 that the observed queues are less than or equal to the modelled queues for the evening peak. The model could be calibrated to reflect the observed queues but in order to be robust in our junction analysis the model has been left uncalibrated (since the modelled queue is higher than the surveyed queue for some arms).

Table 2.2 ARCADY Results – Dawley Road/North Hyde Road/Millington Road/Bourne Avenue Roundabout – Existing

ARM	AM Peak			PM Peak		
	RFC	Queue	Observed Queue	RFC	Queue	Observed Queue
Dawley Road (N)	0.708	2	0.4	0.667	2	0
North Hyde Road	0.495	1	0.2	0.495	1	0.8
Millington Road	0.037	0	0	0.269	0	0.4
Dawley Road (S)	0.719	3	0.1	0.651	2	0.1
Bourne Avenue	0.600	2	1.6	0.374	1	1.2

- 2.5.4 It can be seen from Table 2.2 that the existing roundabout operates within capacity under existing traffic flows. It should be noted from the Table 2.2 that the observed queues are less than or equal to the modelled queues for both morning and evening peaks. The model could be calibrated to reflect the observed queues but in order to be robust in our junction analysis the models have been left uncalibrated (since the modelled queue is higher than the surveyed queue for some arms).

Table 2.3 PICADY Results – North Hyde Road/Millington Road priority junction – Existing

ARM	AM Peak		PM Peak	
	RFC	Queue	RFC	RFC
Millington Road right turn	0.020	0	0.127	0
North Hyde Road (W) right turn	0.011	0	0.011	0

- 2.5.5 It can be seen from Table 2.3 that the existing priority junction operates within capacity under existing traffic flows.

Table 2.4 PICADY Results – Station Road /Millington Road/ Bedwell Gardens priority junction– Existing

ARM	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
Millington Road right turn	0.089	0	0.221	0
Station Road (S) right turn	0.050	0	0.046	0
Bedwell Gardens right turn	0.334	1	0.164	0
Station Road (N) right turn	0.127	0	0.034	0

- 2.5.6 It can be seen from Table 2.4 that the existing priority junction operates within capacity under existing traffic flows.

Table 2.5 ARCADY Results - Dawley Road/Station Road/Shepiston Lane mini-roundabout – Existing

ARM	AM Peak			PM Peak		
	RFC	Queue	Observed Queue	RFC	Queue	Observed Queue
Dawley Road (N)	1.024	26	1.6	1.113	57	1.5
Station Road	0.837	5	1.3	0.955	11	1.2
Shepiston Lane	0.610	2	1	0.595	2	0.3

- 2.5.7 It can be seen from Table 2.5 that the modelled queues do not reflect on-site observations. The initial assessment of the peak hour flows in the morning and evening weekday peak periods therefore required further calibration to satisfactorily match observed queues on-site.
- 2.5.8 To ensure the ARCADY assessment reflects observed queue lengths, the site specific intercept correction option was selected and the model manually adjusted accordingly, in a similar manner to the assessment which supported the ASDA application. The results of these tests are included in Appendix D and summarised in Table 2.6.

Table 2.6 ARCADY Results - Dawley Road/Station Road/Shepiston Lane mini-roundabout – Existing Validated

ARM	AM Peak			PM Peak		
	RFC	Queue	Observed Queue	RFC	Queue	Observed Queue
Dawley Road (N)	0.639	2	1.6	0.627	2	1.5
Station Road	0.563	1	1.3	0.516	1	1.2
Shepiston Lane	0.611	2	1	0.597	2	0.3

- 2.5.9 It can be seen that the modelled queue length and the queue lengths observed on-site are comparable to each other to demonstrate that surveyed conditions are reflected within the adjusted model in Table 2.6.

Table 2.7 LINSIG Results – High Street / Station Road signal junction – Existing

Link	ARM	AM Peak (56s)		PM Peak (56s)	
		DoS	Queue	DoS	Queue
1/1	Station Road (N) Ahead	52.9	5.6	40.4	3.8
1/2	Station Road (N) Right	47.5	3.4	51.8	3.4
2/1	High Street (S) Ahead Left	58.2	7.9	73.0	10.7
3/1	Station Road (W) Left Right	97.7	15.6	77.6	7.6
PRC		-8.5%		15.9%	

- 2.5.10 The base LINSIG Model was validated using the degree of saturation data collected on site. The validated model's degree of saturation should fall within 10% of the site data, full model validation technical note is found in Appendix E. In summary the results of the Base LINSIG validation show that all approaches validate well within the required 10% of the recorded data on site.
- 2.5.11 It can be seen from Table 2.7 that the results of the existing LINSIG modelling show that during the AM peak period the Station Road approach to the junction is at capacity at 97.7% with a queue of 15.6 PCUs. The degree of saturation on all other links, in both peak periods, is below 80% with a reasonable level of spare capacity available.
- 2.5.12 Whilst the junction model reflects what is happening on site, it should be noted that if the signal timings were optimised within the observed cycle time the AM peak degrees of saturation could be reduced below 90%.

Table 2.8 LINSIG Results – North Hyde Road / Station Road signal junction – Existing

Link	ARM	AM Peak (82s)		PM Peak (85s)	
		DoS	Queue	DoS	Queue
1/1	Station Rd S Left Ahead	62.6	7.8	56.1	7.1
1/2	Station Rd S Right	60.8	3.0	86.6	6.4
2/1	Station Rd N Right	26.2	1.4	26.4	1.6
2/2	Station Rd N Left Ahead	74.3	10.6	72.8	10.8
3/1	N Hyde Rd W Ahead Left	79.5	8.0	69.1	7.2
3/2	N Hyde Rd W Right	38.7	1.6	28.3	1.1
4/1	N Hyde Rd E Left Ahead	99.2	25.2	87.4	14.8
4/2	N Hyde Rd E Right	42.1	3.0	41.1	3.0
PRC		-10.3%		3.0%	

- 2.5.13 The base LINSIG Model was validated using the degree of saturation data collected on site. The validated model's degree of saturation should fall within 10% of the site data, full model validation technical note is found in Appendix F. In summary the results of the Base LINSIG validation show that all approaches validate well within the required 10% of the recorded data on site.
- 2.5.14 It can be seen from Table 2.8 that during the AM peak period the North Hyde Road westbound approach to the junction is at capacity at 99.2% with a queue of 25 PCUs. The degree of saturation on all other links is below 85% with some spare capacity available. During the PM peak period the most sensitive in terms of capacity is the North Hyde Road approach to the junction, both in the east and westbound directions, with a degree of saturation exceeding 90%. All other links have a degree of saturation of below 85%. The queues on the flares do not exceed their length on any of the approaches.

Table 2.9 TRANSYT Results –North Hyde Gardens/North Hyde Road/Watersplash Lane/ North Hyde Road / Hayes Bypass / Hayes Road signalised roundabout – Existing

Approach	AM Peak		PM Peak	
	DoS %	Queue	DoS%	Queue
Bulls Bridge Roundabout				
Hayes Road Eastbound nearside	62	4	90	12
Hayes Road Eastbound lane 2	46	2	59	4
Hayes Road Eastbound lane 3	11	0	33	2
The Parkway Southbound nearside	99	25	92	19
The Parkway Southbound lane 2	89	14	94	20
The Parkway Southbound lane 3	89	14	60	7
Hayes Road Westbound nearside	33	2	31	2
Hayes Road Westbound lane 2	56	4	82	9
Hayes Road Westbound lane 3	96	14	77	7
Hayes Road Westbound lane 4	29	2	55	3
The Parkway Northbound nearside	78	11	91	17
The Parkway Northbound lane 2	81	11	86	14
The Parkway Northbound lane 3	74	10	88	17
The Parkway Northbound lane 4	78	10	60	8
North Hyde Rd/ North Hyde Gardens				
North Hyde Gardens Southbound	7	1	12	1
Watersplash Lane	9	0	9	0
North Hyde Rd Eastbound	88	17	88	16
North Hyde Rd Westbound nearside	46	1	52	4
North Hyde Rd Westbound Right turn	12	0	3	0
Internal Links				
Internal Eastbound nearside	27	3	33	3
Internal Eastbound lane 2	25	3	31	3
Internal Eastbound lane 3	31	4	41	3
Internal Eastbound lane 4	8	1	20	0
Internal southbound nearside	30	1	60	3
Internal southbound lane 2	50	3	56	2
Internal southbound lane 3	40	1	29	2
Internal southbound lane 4	14	0	24	0
Internal westbound nearside	17	1	50	5
Internal westbound lane 2	45	8	46	1
Internal westbound lane 3	15	2	35	0
Internal northbound nearside	71	4	59	2
Internal northbound lane 2	66	1	70	4
Internal northbound lane 3	59	5	77	4
Internal northbound lane 4	50	1	47	3

- 2.5.15 The base TRANSYT Model was validated using the degree of saturation data collected on site. Both junctions are signal controlled and operate on UTC SCOOT. Timing sheets and Site Location Drawings were provided to SKM CB by TfL. Average green times and cycle times for each junction were measured on site on the day of the traffic surveys.
- 2.5.16 The existing base TRANSYT model was validated using Degree of Saturation (DoS). DoS was calculated during a survey carried out on the same day as the traffic survey. The results of the DoS validation show that during the AM peak 67% of the measurements fall within 5% of the data recorded on site and further 25%, within 10% of the recorded data.

- 2.5.17 During the PM peak 92% of the measurements fall within 10% of the data recorded on site. The full model validation technical note is found in Appendix G. The results of the DoS validation show that the majority of the links in the TRANSYT model show degrees of saturation consistent to those recorded on site which proves that the model accurately reflects on site traffic conditions and is 'fit for purpose'.
- 2.5.18 It can be seen from Table 2.9 that the AM Existing TRANSYT results show that the Bulls Bridge Roundabout operates close to its capacity limit with the Parkway Southbound approach exceeding 90% degree of saturation. The Hayes Road Westbound approach shows a degree of saturation of 96% in Lane 3.
- 2.5.19 In the evening peak, the results show that the Bulls Bridge Roundabout operate close to its capacity limit with some of the approaches exceeding 90% degree of saturation. The most sensitive in terms of capacity is the Parkway Southbound approach, with degrees of saturation of 92% and 94% in the nearside lane and lane 2 respectively.
- 2.5.20 The model validates well against observed degrees of saturation. However, optimisation of the signal timings within the existing cycle time would result in improvements on the currently observed performance of the junction and could bring degrees of saturation below 90%.

2.6 Collision Data

- 2.6.1 The extent of the study area is shown in Figure 2.4. In the 60 months to 31 December 2011, there were 51 collisions within the study area, resulting in 72 casualties. Of these collisions, 6 resulted in serious injury, and the remaining 45 collisions resulted in slight injury. There were no fatalities. Two collisions (the first described as occurring "50m north of the junction with Bourne Avenue" on Dawley Road, and resulting in slight injury and the second described as "30m north of the junction with North Hyde Road" but plotted on the southern side of North Hyde Road, resulting in a serious injury) were included in the study area although the location description was ambiguous.
- 2.6.2 There were four main clusters of collisions within the study area. 31 collisions occurred at the four arm traffic signal controlled junction of Station Road/ North Hyde Road in the five years to 31 December 2011. Of these, five resulted in serious injury, eight involved pedestrians (three of them children) and nine involved vehicles turning right, although there were no other significant common factors in these turning collisions.
- 2.6.3 A comparison of collisions at this junction, with LB Hillingdon and outer London borough averages, taken from Levels of Collision Risk Issue 12, for ATS junctions is shown in Table 2.10.

Table 2.10 North Hyde Road/ Station Rd: Comparisons with London averages for ATS junctions

Collision type	No of collision	% of Total	% Ave - LB Hillingdon	% Ave Outer London Boroughs
KSI	5	16.1%	9.6%	12.4%
Pedestrian	8	25.8%	10.2%	16.7%
Child	10	32.3%	7.1%	8.1%
Pedal cycle	1	3.2%	3.4%	5.7%
Powered two wheeler	2	6.5%	5.9%	13.2%
Right turning	9	29.0%	32.7%	29.0%
Dark	13	41.9%	33.0%	33.6%
Wet (Non dry)	3	9.7%	20.1%	17.7%
Total collisions (3 Yrs)	31	100%		

- 2.6.4 From the table, the incidence of collisions involving children (five were pedestrians at this junction), pedestrians, pedal cyclists, involving right turners, collisions in the dark or resulting in serious injury were higher than might be expected for this type of junction. One of the three non-dry collisions occurred in frost/icy conditions.
- 2.6.5 However, there has been a steady downward trend in collisions at the junction as the collision rates have fallen from eleven in 2007 to two collisions during 2011, with seven occurring in 2008, six occurring in 2009 and five in 2010, which could indicate that safety has improved over time at this junction.
- 2.6.6 Of the six collisions which occurred at the roundabout junction of North Hyde Road/ Dawley Road, all resulted in slight injury, occurred in the northern to eastern section of the roundabout or approaches, and involved southbound/ south eastbound or westbound vehicles. Three collisions were rear end shunts, two collisions were loss of control collisions (one of which was between a vehicle exiting from north to east and another car heading east to west), and one involved a collision between a southbound vehicle and a pedestrian.
- 2.6.7 A comparison of collisions at this large roundabout junction with LB Hillingdon and outer London borough averages for similar junction types and taken from Levels of Collision Risk Issue 12 is shown in Table 2.11.

Table 2.11 North Hyde Road/ Dawley Road Comparisons with London averages for roundabout junctions

Collision type	No of collision	% of Total	% Ave - LB Hillingdon	% Ave Outer London Boroughs
KSI	0	0.0%	8.2%	8.7%
Pedestrian	1	16.7%	3.3%	5.8%
Child	0	0.0%	4.1%	4.0%
Pedal cycle	0	0.0%	7.4%	8.7%
Powered two wheeler	1	16.7%	12.6%	13.9%
Right turning	0	0.0%	13.4%	10.7%
Dark	2	33.3%	27.1%	29.3%
Wet (Non dry)	3	50.0%	22.3%	18.0%
Total collisions (3 Yrs)	6	100%		

- 2.6.8 From Table 2.11, the percentage of dark and wet road collisions, as well as those involving pedestrians and powered two wheelers, may be higher than expected for this type of junction, but small overall collision numbers mean the percentages should be treated with caution.
- 2.6.9 A further cluster of five collisions occurred on North Hyde Road, approximately 60-80m west of its junction with Albert Road, all resulting in slight injury. There were no common factors in these collisions, other than that two occurred during the hours of darkness and involved north-westbound vehicles (one single vehicle loss of control, and one collision involving a child pedestrian crossing into the path of an oncoming vehicle) and that the other three collisions involved south-eastbound vehicles.
- 2.6.10 A cluster of three collisions occurred on Station Road, close to its junction with Millington Road, of which two involved vehicles turning right (no other common factors) and all three occurred in daylight conditions and resulted in slight injury. It should be noted, however, that there have been no collisions at this simple priority junction since July 2010.
- 2.6.11 The remaining six collisions occurred at separate locations in the study area although two collisions were recorded at the junction of Station Road/Bedwell Gardens. However, the circumstances of these collisions varied, and there were no obvious common factors.
- 2.6.12 Further to the collision analysis undertaken for the main study area- which extended from the North Hyde Road/ Dawley Road roundabout junction eastwards along North Hyde Road up to and including the North Hyde Road/ Station Road/ Old Station Road junction, and then southwards up to and including the junction of Station Road/ Millington Road- the study area has been extended to include three surrounding areas. These are:
- To the south: southwards on Dawley Road from its junction with North Hyde Road up to and including its junction with Station Road; the length of Station Road between Dawley Road and Station Road/ High Street; and northeastwards along Station Road to a point immediately south of the junction with Millington Road;
 - To the north: northwards on Dawley Road from the junction with North Hyde Road up to and including the roundabout junction with Blyth Road; and
 - To the east: the eastern end of North Hyde Road from its junction with North Hyde Gardens eastwards to the Hillingdon borough boundary.
- 2.6.13 The extent of the extended study area is shown in Figure 2.4. This analysis focuses on the collisions which occurred within the extended study area only, in the five year period to 31 December 2011. During this period, there were a total of 31 collisions within the extended study area, resulting in 52 casualties. Of these collisions, two resulted in a fatality, 4 resulted in serious injury, and the remaining 25 collisions were slight in severity.
- 2.6.14 A summary of the main collision types which occurred within each of the extended study area segments is presented in Table 2.12.

Table 2.12 North Hyde Road/ Dawley Road Comparisons with London averages for roundabout junctions

Study Area	South	North	East	Total
Collision type				
KSI	5	0	1	6
Pedestrian	9	1	0	10
Child	5	1	0	6
Pedal cycle	3	1	0	4
Powered two wheeler	2	1	2	5
Right turning	9	3	1	13
Dark	10	1	1	12
Wet (Non dry)	6	3	0	9
Total collisions (5 Yrs)	31	9	5	45

Area to the south

- 2.6.15 From the table, it can be seen the majority of collisions (69%) occurred in the southern study area, which would be expected as this extends across a longer road network area. The majority of collisions involving right turns, pedestrians, wet road conditions or occurring during the hours of darkness also occurred in this section of the extended study area. Five of the collisions resulting in death or serious injury also occurred in this sector, with four of the five KSI collisions occurring on Dawley Road.
- 2.6.16 There were no obvious clusters of collisions within this study area, with only six locations identified which had at least three collisions during the five year study period. These were:
- The priority junction at Dawley Road/ Pinkwell Lane (4 collisions, 1 serious). Two collisions involved loss of control and one had speed as a contributory factor, whilst the fourth collision was a rear end shunt involving southbound vehicles on the major road.
 - The priority junction of Station Road/ Redmead Road (4 collisions). Two of the collisions involved pedestrians being struck by southbound vehicles in the vicinity of the pedestrian crossing located close to this junction, one of which failed to stop.
 - The signal controlled junction of Station Road/ High Street (4 collisions, 1 fatal). The fatality involved a vehicle U turning illegally across the path of a motorcyclist. There were no other common factors in the collisions occurring at this junction.
 - The priority junction of Dawley Road/ Waltham Avenue (3 collisions, 1 serious). All three collisions occurred in dry, daylight conditions. Although two of the collisions involved rear end shunts on the major road, these occurred in different directions (one northbound, one southbound). The third collision involved injury to a passenger as a southbound bus moved off.
 - The priority junction at Station Road/ Bedwell Gardens (3 collisions). Two of the three collisions occurred during the hours of darkness, and all three resulted in slight injury. There were no other obvious common factors in the circumstances of these collisions.
 - The priority junction of Dawley Road/ Redmead Road (3 collisions). Other than occurring in the middle of the day, there were no obvious common factors in these collisions.

Area to the north

2.6.17 From the table, 9 collisions, all resulting in slight injury, occurred in the area to the northern stretch of Dawley Road. There were two locations where three or more collisions occurred during the five year study period:

- The roundabout junction of Dawley Road/ Kestrel Way/ Blyth Road (4 collisions). Although three of the three collisions involved right turns, there were no other obvious common factors in these collisions.
- Dawley Road, approximately 40m south of the junction with Kestrel Road (3 collisions), of which two involved collisions when southbound vehicles were being overtaken on their offside.

Area to the east

2.6.18 From the table, only 5 collisions occurred across the whole area during the five year study period, of which one resulted in a fatality. Of these, although two are described as having occurred at the junction with North Hyde Gardens, only one involved a vehicle turning into the minor road (and resulting in a motorcyclist fatality)

2.6.19 No detailed comparisons with Hillingdon or Outer London average collision statistics were undertaken for these individual locations/ junctions, as the overall low numbers may have produced skewed results when comparing percentages.

2.7 Public Transport

2.7.1 The following section outlines the existing public transport infrastructure within the vicinity of the development and provides an assessment of the accessibility of the site by public transport. Location of the nearest bus stops, railway station and the local bus network are shown in Figure 2.5.

Bus

2.7.2 The main bus corridor close to the development is Station Road. It is served by a variety of bus routes which are summarised in Table 2.13.

Table 2.13 Bus Frequency Per Hour

Stop Location	Service	Route	Frequency (peak)
North Hyde Road	350	Heathrow Terminal 5	5
Station Road	E6	Bulls Bridge to Greenford	6
	H98	Hayes End to Hounslow	7.5
	140	Harrow Weald – Heathrow Terminal s 1,2,3	7.5
	U4	Bourne Farm – Uxbridge	7.5
	90	Feltham to Northolt	6
	U5	Uxbridge	5
	195	Brentford to Charville Lane Estate	5

2.7.3 These buses give access to a number of destinations including Uxbridge, Heathrow Terminals and Brentford. During the weekday peak period, there are up to 45 services running along Station

Road and up to 5 services along North Hyde Road. The nearest bus stop is located immediately north of the development site on North Hyde Road.

Rail

- 2.7.4 The nearest station to the site is Hayes and Harlington which is some 700m away. Train operator, First Great Western, operates up to 8 trains to London Paddington Railway Station.

Public Transport Accessibility Level

- 2.7.5 The Public Transport Accessibility Level (PTAL) is a method of measuring accessibility to the public transport network, taking into account walk access time and service availability. The rating is from 1 (very poor) to 6 (excellent). Appendix B of TfL's Transport Assessment Best Practice Guidance details the calculation for determining PTAL. The calculation is based on frequency of services, as well as their number and proximity.
- 2.7.6 The site is located within an area of PTAL level 3. This has been calculated from the TfL Planning Information Database (<http://webpid.elgin.gov.uk/>), the report is included as Appendix H. This indicates that the site has "moderate accessibility".

2.8 Pedestrian and Cyclist

- 2.8.1 North Hyde Road and Station Road have footway along both sides and are well lit. Pedestrian movement is well catered for locally with pedestrian footways provided on both sides of the carriageway, throughout the surrounding highway.
- 2.8.2 Dedicated staggered pedestrian crossings are provided across all arms of the Station Road/North Hyde Road traffic signal junction, which provide access to local public transport services.
- 2.8.3 A signal controlled pedestrian crossing (Puffin) is also provided across Station Road, to the south of its junction with Millington Road.
- 2.8.4 Pedestrian refuge islands are located on North Hyde Road to cater for pedestrian movement, but no formal signal controlled crossings are provided between the junction with Station Road and Dawley Road.
- 2.8.5 At the roundabout junction of North Hyde Road/Dawley Road/Bourne Avenue dropped kerb crossings, with tactile paving, is provided on all arms of the roundabout junction.
- 2.8.6 Currently, there is provision for cyclists in the form of advisory cycle routes along Old Station Road and Bedwell Gardens. Keith Road and the section of Station Road between Nestle's Avenue and Western View are signed cycle routes, refer to Figure 2.6
- 2.8.7 Destination such as Hillingdon, West Drayton, Hounslow and Southall can be reached within 20 minutes by bike. The local cycle network within the area is shown in Figure 2.7 and illustrates a 2km (25 minute walk), and a 5km cycle isochrones from the site.

3 Policy Background

3.1 Introduction

3.1.1 The following section provides an examination of current transport and land use policies on a National, and local level as they relate to the proposed development at HPH, Hillingdon.

3.1.2 In particular, this section reviews:

- National Planning Policy Framework;
- The London Plan (2011); and
- London Borough of Hillingdon Unitary Development Plan (UDP) (adopted 1998) Saved Policies 27th September 2007.

3.2 National Policy Planning Framework (NPPF)

3.2.1 The National Planning Policy Framework (NPPF) document sets out national planning policies for England. It supersedes and replaces almost all previous national planning policy statements (PPS) and planning policy guidance notes (PPG), including PPG13 Transport. National Policy in relation to transport is now set out at Chapter 4, Policies 29 to 41, of the NPPF.

3.2.2 Policies 29, 30, 33 and 37 of the NPPF sets out plan-making policy, whilst Policy 31 relates to development of strategies between local authorities and therefore, these are not relevant to the determination of this planning application. This is also the case with Policy 39 and 40, which relate to the setting of parking standards and town centre parking, and Policy 41 which discusses local authorities' duty in securing infrastructure development.

3.2.3 Policy 32 notes that all developments that generate significant amounts of movement should be accompanied by a Transport Statement or Transport Assessment and that plans and decisions should take account of whether:

- 'the opportunities for sustainable transport modes have been taken up depending on the nature and location of the site, to reduce the need for major transport infrastructure;
- safe and suitable access to the site can be achieved for all people; and
- improvements can be undertaken within the transport network that cost effectively limit the significant impacts of the development. Development should only be prevented or refused on transport grounds where the residual cumulative impacts of development are severe.'

3.2.4 Similarly, Policy 34 also notes (inter alia) 'Plans and decisions should ensure developments that generate significant movement are located where the need to travel will be minimised and the use of sustainable transport modes can be maximised.'

3.2.5 In line with NPPF, a Transport Assessment and Travel Plan (in accordance with Policy 36) have been undertaken and submitted in support of this application. As well as ensuring that the

location of the development enables sustainable travel, Policy 35 also discusses the design of development noting that, where practical, developments should inter alia:

- accommodate the efficient delivery of goods and supplies;
- give priority to pedestrian and cycle movements, and have access to high quality public transport facilities;
- create safe and secure layouts which minimise conflicts between traffic and cyclists or pedestrians, avoiding street clutter;
- incorporate facilities for charging plug-in and other ultra-low emission vehicles; and
- consider the needs of people with disabilities by all modes of transport.

3.2.6 Policy 39 of the NPPF discusses what should be taken into account by local authorities when setting their parking standards. Therefore, with the replacement of PPG13, there are now no national parking standards and as such, it is considered that LBH and London Plan parking standards remain the most up to date and appropriate standards.

3.2.7 Following examination of the relevant section of the NPPF, we conclude that the transport-related requirements of the NPPF have been addressed and that the proposed development complies with transport-related NPPF policy.

3.3 Regional Planning Policy: London Plan (2011)

3.3.1 The London Plan, which was formally adopted in July 2011, thereby replacing the 2008 London Plan (consolidated with alterations since 2004), sets out the integrated economic, environment, transport and social framework for the development of London over the next 20-25 years. Together with LBH's own local planning policies, the London Plan forms part of the Local Development Plan for the borough.

3.3.2 Specific transport policies are detailed within Section 6 of the London Plan. Integrating transport and development acts as the central theme, with an aspiration to encourage development that reduces the need to travel, especially by car, and locating developments that generate high levels of trips at locations with either current or committed high levels of accessibility to public transport, cycling and pedestrian networks, with proposals not adversely affecting the safety of these networks.

3.3.3 Without reproducing the detailed content of specific policies, the London Plan identifies that development proposals should support sustainable travel through the inclusion of appropriate cycle parking and facilities, high quality pedestrian environments and details maximum car parking standards for various forms of land use. As well as this quantitative assessment of car parking, the London Plan also includes qualitative expectations with regards to spaces for electric vehicles, disabled vehicles and delivery and service vehicles.

3.3.4 Policy 6.3 sets out the requirement that TAs should be produced in accordance with TfLs Transport Assessment Best Practice Guidance for major planning applications and that where developments exceed relevant thresholds Travel Plans should be produced.

3.3.5 The TA will demonstrate that the site is within a sustainable location and is accessible by sustainable modes of travel, thereby complementing the London Plan.

3.4 London Borough of Hillingdon Unitary Development Plan (adopted 1998) Saved Policies 27th September 2007

3.4.1 The LBH UDP was originally adopted in 1998. Saved Policies (September 2007) remain effective.

3.4.2 Policy AM2 states that:

All proposals for development will be assessed against:

- i. *Their contribution to traffic generation and their impact on congestion, particularly on the principal road network as defined in paragraph 14.14 of the plan, and*
- ii. *The present and potential availability of public transport, and its capacity to meet increased demand.*

3.4.3 Policy AM7 states that:

The local planning authority will consider whether the traffic generated by proposed developments is acceptable in terms of the capacity and functions of existing and committed principal roads only, and will wholly discount any potential which local distributor and access roads may have for carrying through traffic.

The local planning authority will not grant permission for developments whose traffic generation is likely to:

- i. *Unacceptably increase demand along roads or through junctions which are already used to capacity, especially where such roads or junctions form part of the strategic London road network; or*
- ii. *Prejudice the free flow of traffic or conditions of general highway or pedestrian safety;*

3.5 Parking Standards

3.5.1 Policy AM14 within LBHUDP Saved Policies states that new development will only permitted where it accords with the Council's adopted car parking standards.

3.5.2 The London Plan also sets out car parking standards within Table 6.2. A summary of the car parking standards are shown in Table 3.1.

Table 3.1 Car Parking Standards

Land Use	Hillingdon	London Plan - Outer London
B1(a)	1 space per 100 sq.m	1 space per 100 to 600 sq.m

3.5.3 The London Plan also requires 20 per cent of all spaces must be for electric vehicles with an additional 10 per cent passive provision for electric vehicles in the future.

3.5.4 Table 3.2 summarised the cycle parking provision within LBH UDP and The London Plan.

Table 3.2 **Cycle Parking Standards**

Land Use	Hillingdon	London Plan
B1 (a)	1 space per 50 sq.m	1 space per 250 sqm

3.5.5 The London Plan existing minimum cycle parking standard within Table 3.2 are based on those originally published by TfL in 2004. A review has been undertaken in to ensure adequate levels of cycle parking are provided. The report summarised the evidence used to support the B1 business cycle parking standards from 1 parking space for every 250sqm to 1 parking for every 150sqm.

3.6 Summary

3.6.1 The development proposals seek to provide a B1 Office development in an area of good accessibility. The proposal accords with national, regional and local transport-related planning policies.

4 Development Proposals

4.1 Introduction

4.1.1 This chapter provides an overview of the development proposals, as well the proposed transport access strategy by car, public transport, foot and cycle.

4.2 Development Schedule

4.2.1 The proposed schedule of development is shown in Table 4.1. The proposed location of the HPH 5 is shown in Figure 4.1.

Table 4.1 Development Quantum

Building	Land Use (Class)	Gross Floor Area	Car Parking Provision
HPH 5	Office (B1)	13,880 sqm	140 spaces of which 14 are disabled spaces

4.2.2 As discussed in Section 1, this TA will also cover the impact of the HPH 4 proposals.

4.3 Vehicular Access

4.3.1 It is proposed to utilise the three existing vehicular accesses at Hyde Park Hayes, which are:

- Millington Road/Station Road junction;
- North Hyde Road/Millington Road West junction; and
- A437/North Hyde Road/Dawley Road/Millington Road/ Bourne Avenue junction (5-arm Roundabout).

4.3.2 For HPH 5, servicing and deliveries vehicles will be off Millington Road along the east elevation. Deliveries can be unloaded at the drop off point adjacent to the bin-store. This allows access for transit vans and rigid delivery vehicles. Vehicle swept paths of a large refuse vehicle undertaking these movements can be seen in Figure 4.2

4.4 Car Parking

4.4.1 The basement car parking within HPH 5 is accessed via a two-way ramp off Millington Road along the eastern elevation and provides parking for 103 cars of which 7 are disabled spaces. The remaining 37 car parking spaces are provided at grade of which 7 are designated for people with disabilities. The vehicle swept path also shown demonstrates that the proposed ramp can be used safely by a large car, see Figure 4.3.

4.4.2 The proposed car parking provision of the development is just over 1 per 100 sqm which is broadly in line with LBH's car parking standard of 1:100 sqm and London Plan standard of between 1 per 100 to 600 sqm. It should be noted that 20% of all spaces will be provided with electric charging points with additional 10% passive provision in accordance with the London Plan standards.

4.5 Cycle Parking

- 4.5.1 Secure, covered cycle parking will be provided in accordance with TfL's recent research undertaken on cycle parking provision for office use. TfL have proposed to increase the cycle parking standard within The London Plan from 1 per 250 sqm to 1 per 150 sqm.
- 4.5.2 The proposed cycle parking provision of 94 spaces for the development is in-line with the revised standard set London Plan for office.

5 Trip Generation and Distribution

5.1 Trip rates

- 5.1.1 The trip rates to be used in this assessment will be derived from the latest data contained within the (Trip Rate Assessment Valid for London) TRAVL database. The selection criteria used was that all selected sites should be at least 3000 sqm GFA within an area with a PTAL value of between 1 and 4 within Outer London and have been surveyed after the year 2000.
- 5.1.2 The sites selected to derive the office trip generation are summarised below:
- Hounslow Civic Centre, LB Hounslow, PTAL 2, 2004;
 - Sky Headquarters, LB Hounslow, PTAL 2, 2009; and
 - Tearfund Head Office, LB Richmond Upon Thames, PTAL 2, 2006.
- 5.1.3 The TRAVL output files detailing the selection criteria and the sites selected for use in the assessment for each land use type are set out in Appendix I of this report.
- 5.1.4 The trip rates for the peak hour periods are defined as being 0800-0900 for the morning peak, 1700-1800 for the evening peak hour period. Table 5.1 and Table 5.2 show the initial trip rates and subsequent trip generation that has been calculated for the proposed HPH 5 office development as well HPH 4.

Table 5.1 Peak Hour Trip Rates

AM Peak Trip Rates			PM Peak Trip Rates		
IN	OUT	TOTAL	IN	OUT	TOTAL
0.920	0.119	1.039	0.162	0.930	1.092

Table 5.2 Estimated Trip Generation

Building	AM Peak Trips			PM Peak Trips		
	IN	OUT	TOTAL	IN	OUT	TOTAL
HPH 5	129	17	146	23	130	152
HPH 4	66	8	74	12	67	79
TOTAL	195	25	220	35	197	231

5.2 Traffic distribution

- 5.2.1 The traffic generated by the development has been distributed onto the surrounding road network using 2001 Census Travel to work data (daytime population) for the Ward of Pinkwell, which provides an origin and destination for each trip. The results of the origin / destination census data for Pinkwell ward is provided in Appendix J. Development generated traffic been distributed based on direction of travel and the proposed vehicular distribution is shown in Table 5.3.

Table 5.3 Proposed Development Distribution

Distribution	
Station Road - South	6.4%
Station Road – North	1.7%
Dawley Road - North	11.0%
Dawley Road - South	41.7%
Bourne Avenue	1.4%
North Hyde Road - North (via Bullsbridge)	17.0%
North Hyde Road - East (via Bullsbridge)	8.0%
North Hyde Road - South (via Bullsbridge)	12.8%
TOTAL	100%

5.2.2 The AM and PM peak hour development generated traffic for HPH 4 is shown in Figure 5.1 and Figure 5.2. Development generated traffic for HPH 5 is shown in Figure 5.3 and Figure 5.4. The full development traffic (HPH 4 & 5) is shown Figure 5.5 and Figure 5.6.

5.3 Background Traffic Growth

5.3.1 It is anticipated the opening year for the development is 2014. At the request of LBH Highways background traffic growth has been applied to the 2012 surveyed flows within the study area, which is in addition to traffic movements associated with committed developments detailed in the next section.

5.3.2 In this case the 2012 surveyed traffic data, are 'growthed' using the National Traffic Model calculation to give a base traffic level for 2014, the estimated year of opening and a further calculation gives a base traffic level for the 2024 assessment year which is 10 years after the opening year.

5.3.3 The local growth factors in the National Traffic Model for traffic between 2012 and 2014 is an increase of 0.87% in the weekday AM peak and an increase of 0.95% in the weekday PM peak

5.3.4 The local growth factors in the National Traffic Model for traffic between 2014 and 2024 is an increase of 15.5% in the weekday AM peak and an increase of 16.4% in the weekday PM peak

5.3.5 The Base 2014 traffic is shown in Figure 5.7 and Figure 5.8. The Base 2024 traffic shown Figure 5.9 and Figure 5.10.

5.4 Committed Development

5.4.1 Officers at LBH have requested that the traffic impact of locally committed developments are considered within this assessment, as part of the baseline traffic conditions. In this case 'committed development' will include:-

- Development that is in receipt of planning consent, but has not yet been constructed;
- Development that has been constructed or partially constructed, but is currently occupied or partially occupied; and
- Development that is under planning consideration.

5.4.2 As part of the Borough Council's pre-application response, the following planning applications have been identified as committed development sites, for consideration within this TA:

- i. 20 Blyth Road;
- ii. 243 Blyth Road;
- iii. High Point Village, Station Approach;
- iv. Hayes Stadium;
- v. Hayes Football Club;
- vi. Former C R L and Mermaid Buildings Dawley Road Hayes;
- vii. Southall Gas Works;
- viii. Gatefold Building, Blyth Road;
- ix. Redevelopment of the Old Vinyl Factory, Former EMI site, Blyth Road

20 Blyth Road

5.4.3 The site currently consists of derelict land. The development proposals are predominantly residential comprising a total of 123 dwellings and 566 sqm B1 commercial use. The TA prepared in association with this development by WSP, the distribution of committed development traffic for the 20 Blyth Road is detailed in Figure 5.11 and Figure 5.12. As the TA's study area is very limited, the assumption is that any of site's development traffic beyond WSP's TA's distribution will be assigned using existing surveyed turning movements.

243 Blyth Road

5.4.4 The development proposals seek permission for the redevelopment of the site, involving the extension of the exiting office building to create a 120 bed hotel. No traffic distribution was undertaken within Motion's TA as it concluded that the proposals will offer a reduction in trips on the local highway network. Therefore the morning and evening peak flows have been assigned using existing surveyed turning movements and are summarised in Figure 5.13 and Figure 5.14.

High Point Village, Station Approach

5.4.5 The development proposals are predominantly residential comprising a total of 576 dwellings an apart-hotel, retail, restaurant and associated leisure uses. The TA prepared in association with this development by WSP, the distribution of committed development traffic for High Point Village is detailed in Figure 5.15 and Figure 5.16. As the TA's study area is very limited, the assumption is that any of site's traffic distribution beyond WSP's TA will be assigned using existing surveyed turning movements.

Hayes Stadium & Hayes Football Club

5.4.6 Both developments are residential with Hayes Stadium consisting 261 units and Hayes Football Club consisting of 185 units. LBH Highways has agreed that development traffic from these developments can be included in the allowance for traffic growth which is discussed later.

Former C R L and Mermaid Buildings Dawley Road Hayes

- 5.4.7 The existing development consists of 11,122 sqm of B1 office space with 240 car parking spaces on-site. The proposals consists of 11,088 sqm of B1(b), B1(c) and B8 uses and 112 associated car parking spaces. It has not been possible to obtain the TA for the scheme, but the slight reduction in floor area of the proposed scheme and over 50% reduction on the level of car parking on-site, it is considered that the development traffic should be included in the allowance for traffic growth.

Southall Gas Works

- 5.4.8 The Southall Gas Works site is a 37 hectare mixed use development, located to the east of the A3122, Hayes By-pass. This site includes planning consent for a 5,850sq.m GFA foodstore. Under LBH Highways' guidance, the development traffic flows for this site is taken from the ASDA TA and are detailed in Figure 5.17 and Figure 5.18.

Gatefold Building, Blyth Road & Redevelopment of the Old Vinly Factory, Former EMI site, Blyth Road

- 5.4.9 The development proposals seek permission for the redevelopment of the site to a mixed use development. Alan Baxter & Associates are the transport consultant on both developments. No traffic distributions were undertaken within the TAs as it concluded that the proposals will offer a reduction in trips on the local highway network. Therefore the morning and evening peak flows have been assigned using proposed development distribution in Table 5.3 in and out of the proposed development site then development traffic are assigned using existing surveyed turning movements. Figure 5.19 and Figure 5.20 summarised the morning and evening peak traffic distribution of the development. Details on how the development traffic is made up by different consents are detailed in Appendix K.
- 5.4.10 Traffic generated by all the forthcoming developments mentioned in this section have been combined to form the Committed Developments traffic flows which is summarised in Figure 5.21 and Figure 5.22.

5.5 Multimodal Trip Generation

- 5.5.1 The modal splits for the proposed development are based on the trip rates by mode and time from the TRAVL surveys for the sites identified in Section 5.1. The modal splits and estimated average AM and PM hour trips by each mode are summarised in Table 5.4.

Table 5.4 Main method of travel to work and person trips

Model Choice	Percentage%	AM Peak Person Trips			PM Peak Person Trips		
		HPH 4	HPH 5	TOTAL	HPH 4	HPH 5	TOTAL
Car Driver	46	81	157	238	74	144	219
Car Passenger	5	9	17	26	8	16	24
Bus	5	9	17	26	8	16	24
Coach	2	4	7	10	3	6	10
Motor Cycle	2	4	7	10	3	6	10
Walk	15	26	51	78	24	47	71
Pedal Cycle	3	5	10	16	5	9	14
Rail	15	26	51	78	24	47	71
Underground	7	12	24	36	11	22	33
TOTAL	100	176	342	518	161	314	475

- 5.5.2 It can be seen that the HPH 5 proposal would result in 342 two-way trips in the morning peak and 314 two-way trips in the evening peak. The combined development proposal would result in 518 two-way trips in the morning peak and 475 two-way trips in the evening.

5.6 Sensitivity Testing Assumptions

- 5.6.1 Officers at LBH have requested that the traffic impact of the ASDA scheme as well as a replacement scheme at the Old Vinyl Factory, Former EMI site to be considered as a sensitivity analysis. Development generated traffic data detail for both schemes are contained in Appendix K of this report.
- 5.6.2 In addition, it has been requested that the sensitivity tests include an alternative distribution scenario for the development generated traffic. Development generated traffic been distributed based the proposed sensitivity distribution which is shown in Table 5.5.

Table 5.5 Proposed Development Distribution Sensitivity

Distribution	
Station Road - South	6.4%
Station Road – North	1.7%
Dawley Road - North	17.0%
Dawley Road - South	12.8%
Bourne Avenue	1.4%
North Hyde Road - North (via Bullsbridge)	11.0%
North Hyde Road - East (via Bullsbridge)	8.0%
North Hyde Road - South (via Bullsbridge)	41.7%
TOTAL	100%

- 5.6.3 The AM and PM peak hour development generated traffic for HPH 4 is shown in Figure 5.23 and Figure 5.24. Development generated traffic for HPH 5 is shown in Figure 5.25 and Figure 5.26. The full development traffic (HPH 4 & 5) is shown Figure 5.27 and Figure 5.28.

6 Modelling approach

6.1 Traffic Flow Scenarios

- 6.1.1 The Baseline 2014 traffic flows are derived by adding the 2014 traffic flows to the committed development flows. The Baseline 2014 flows for the AM and PM peak periods are shown in Figure 6.1 and Figure 6.2.
- 6.1.2 The Baseline 2024 traffic flows are derived by adding the 2024 traffic flows to the committed development flows. The Baseline 2024 flows for the AM and PM peak periods are shown in Figure 6.3 and Figure 6.4.
- 6.1.3 The Baseline 2014 With Development traffic flows scenarios are derived by:
- Adding the Baseline 2014 flows with HPH 5 development generated flows. The 2014 With HPH4 flows are shown in Figure 6.5 and Figure 6.6; and
 - Adding the Baseline 2014 flows with HPH 4 and HPH 5 development generated flows. The 2014 With Full Development flows are shown in Figure 6.7 and Figure 6.8.
- 6.1.4 Similarly the Baseline 2024 With Development traffic flows scenarios are derived by:
- Adding the Baseline 2024 flows with HPH 5 development generated flows. The 2024 With HPH4 flows are shown in Figure 6.9 and Figure 6.10; and
 - Adding the Baseline 2024 flows with HPH 4 and HPH 5 development generated flows. The 2024 With Full Development flows are shown in Figure 6.11 and Figure 6.12.
- 6.1.5 The Baseline 2014 Sensitivity traffic flows are derived by adding the 2014 traffic flows to the Sensitivity Committed Development flows. The Baseline 2014 Sensitivity flows for the AM and PM peak periods are shown in Figure 6.13 and Figure 6.14.
- 6.1.6 The Baseline 2024 Sensitivity traffic flows are derived by adding the 2024 traffic flows to the Sensitivity Committed Development flows. The Baseline 2024 Sensitivity flows for the AM and PM peak periods are shown in Figure 6.15 and Figure 6.16.
- 6.1.7 The 2014 With Full Development Sensitivity traffic flows scenarios are derived by adding the Baseline 2014 Sensitivity flows to HPH 4 and HPH 5 development generated flows. The 2014 With Full Development Sensitivity flows are shown in Figure 6.17 and Figure 6.18.
- 6.1.8 The Baseline 2024 With Full Development Sensitivity traffic flows scenarios are derived by adding the Baseline 2024 Sensitivity flows with HPH 4 and HPH 5 development generated flows. The 2024 With Full Development Sensitivity flows are shown in Figure 6.19 and Figure 6.20.

6.2 Modelling Methodology

- 6.2.1 Industry standard software (ARCADY, PICADY TRANSYT and LINSIG) are used to test the capacity of junctions mentioned in Section 2.5 during both AM Peak and PM Peak weekday periods, under the following scenarios:

- Baseline 2014;
- Baseline 2024;
- 2014 With HPH 5;
- 2014 With Full Development;
- 2024 With HPH 5;
- 2024 With Full Development;
- Sensitivity Scenario Baseline 2014;
- Sensitivity Scenario Baseline 2024;
- Sensitivity Scenario 2014 With Full Development; and
- Sensitivity Scenario 2024 With Full Development.

7 Traffic Impact

7.1 Baseline Junction Performance

Baseline 2014

- 7.1.1 Each of the junctions assessed in Section 2 of this report have been re-assessed using the Baseline 2014 traffic flows. Full outputs of each of the baseline model results can be seen in Appendix L. The following paragraphs describe the results of these models under Baseline 2014 flows.

Dawley Road/Blyth Road/Kestral Way/Betam Road Roundabout

- 7.1.2 This is an existing five-arm roundabout. The performance of this junction under Baseline 2014 flows is summarised in Table 7.1.

Table 7.1 Dawley Road/Blyth Road/Kestral Way/Betam Road Roundabout -Baseline 2014

ARM	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
Dawley Road (N)	0.644	2	0.489	1
Blyth Road	0.780	3	0.688	2
Dawley Road (S)	0.731	3	0.714	3
Kestral Way	0.084	0	0.231	0
Betam Road	0.052	0	0.124	0

- 7.1.3 It can be seen from Table 7.1 that this junction continues to operate within capacity under anticipated Baseline 2014 traffic flows, with RFC's below 0.85 on all arms and minimal queuing taking place.

Dawley Road/North Hyde Road/Millington Road/Bourne Avenue Roundabout

- 7.1.4 This is an existing five-arm roundabout. The performance of this junction under Baseline 2014 flows is summarised in Table 7.2.

Table 7.2 Dawley Road/North Hyde Road/Millington Road/Bourne Avenue Roundabout - Baseline 2014

ARM	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
Dawley Road (N)	0.733	3	0.703	2
North Hyde Road	0.586	1	0.552	1
Millington Road	0.041	0	0.288	0
Dawley Road (S)	0.709	2	0.712	2
Bourne Avenue	0.630	2	0.416	1

- 7.1.5 It can be seen from Table 7.2 that this junction continues to operate within capacity under anticipated Baseline 2014 traffic flows, with RFC's below 0.85 on all arms and minimal queuing taking place.

Dawley Road/Station Road/Shepiston Lane mini-roundabout

- 7.1.6 This is an existing three-arm mini-roundabout. The performance of this junction under Baseline 2014 flows is summarised in Table 7.3.

Table 7.3 Dawley Road/Station Road/Shepiston Lane mini-roundabout – Baseline 2014

ARM	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
Dawley Road (N)	0.672	2	0.640	2
Station Road	0.591	1	0.530	1
Shepiston Lane	0.586	1	0.654	2

- 7.1.7 It can be seen from Table 7.3 that this junction continues to operate within capacity under anticipated Baseline 2014 traffic flows, with RFC's below 0.85 on all arms and minimal queuing taking place.

North Hyde Road/Millington Road priority junction

- 7.1.8 This is an existing three-arm priority junction. The performance of this junction under Baseline 2014 flows is summarised in Table 7.4.

Table 7.4 North Hyde Road/Millington Road priority junction – Baseline 2014

ARM	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
Millington Road right turn	0.021	0	0.132	0
North Hyde Road (W) right turn	0.011	0	0.011	0

- 7.1.9 It can be seen from Table 7.4 that this junction continues to operate within capacity under anticipated Baseline 2014 traffic flows, with RFC's below 0.85 on all arms and minimal queuing taking place.

Station Road /Millington Road/ Bedwell Gardens priority junction

- 7.1.10 This is an existing four-arm priority junction. The performance of this junction under Baseline 2014 flows is summarised in Table 7.5.

Table 7.5 Station Road /Millington Road/ Bedwell Gardens priority junction – Baseline 2014

ARM	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
Millington Road right turn	0.091	0	0.230	0
Station Road (S) right turn	0.052	0	0.046	0
Bedwell Gardens right turn	0.356	1	0.177	0
Station Road (N) right turn	0.129	0	0.034	0

- 7.1.11 It can be seen from Table 7.5 that this junction continues to operate within capacity under anticipated Baseline 2014 traffic flows, with RFC's below 0.85 on all arms and minimal queuing taking place.

North Hyde Road / Station Road signal junction

This is an existing four-arm signalised junction. The performance of this junction under Baseline 2014 flows is summarised in Table 7.6.

Table 7.6 North Hyde Road / Station Road signal junction – Baseline 2014

Link	ARM	AM Peak (82s)		PM Peak (85s)	
		DoS	Queue	DoS	Queue
1/1	Station Rd S Left Ahead	71.0	8.6	57.4	7.6
1/2	Station Rd S Right	80.9	4.4	94.2	10.0
2/1	Station Rd N Right	63.6	3.1	35.4	2.2
2/2	Station Rd N Left Ahead	94.0	17.0	73.6	11.3
3/1	N Hyde Rd W Ahead Left	66.4	7.5	94.0	13.7
3/2	N Hyde Rd W Right	39.3	1.5	28.3	1.1
4/1	N Hyde Rd E Left Ahead	97.8	24.6	98.7	23.6
4/2	N Hyde Rd E Right	27.7	2.0	82.4	5.8
PRC		-8.6%		-9.7%	

7.1.12 It can be seen from Table 7.6 that similar to the existing situation the junction has DoS over 90%. In the morning peak hour there is a capacity problem on the Station Road North left and ahead lane and North Hyde Road East left and ahead lane, with a degree of saturation over 90% for both lanes. The practical reserve capacity (PRC) for the junction during the morning peak is -8.6%.

7.1.13 In the PM peak both the Station Road South right turn lane, North Hyde Road West ahead and left as well as North Hyde Rd East left and ahead lane are over-capacity. The PRC for the junction during the morning peak is -9.7%.

High Street / Station Road signals junction

7.1.14 This is an existing three-arm signalised junction. The existing cycle time measured on the day of the traffic survey has been maintained but the green times were optimised manually with LINSIG. The performance of this junction under Baseline 2014 flows is summarised in Table 7.7.

Table 7.7 High Street / Station Road signals junction – Baseline 2014

Link	ARM	AM Peak (56s)		PM Peak (56s)	
		DoS	Queue	DoS	Queue
1/1	Station Road (N) Ahead	67.4	7.7	42.3	4.0
1/2	Station Road (N) Right	57.3	4.0	53.2	3.6
2/1	High Street (S) Ahead Left	75.1	9.2	76.5	11.5
3/1	Station Road (W) Left Right	75.5	7.9	79.1	7.8
PRC		19.1%		13.8%	

7.1.15 It can be seen from Table 7.7 that this junction operates within capacity with degree of saturation below 90% for all arms. Reference back to Section 2.5 of this report shows that the junction is currently observed to have some capacity problems within the AM peak, but this is due to the signal timings that have been applied and can be resolved by optimising the green times within the existing observed cycle times, as demonstrated above.

*North Hyde Gardens/North Hyde Road/Watersplash Lane & North Hyde Road / Hayes Bypass / Hayes Road
signalised roundabout*

- 7.1.16 This is an existing four-arm signalised junction and four-arm signalised roundabout. For the Baseline 2014 flows, the existing cycle time is maintained. The green times and offsets are optimised manually within TRANSYT, to reflect how SCOOT would operate, with the increased traffic flows.
- 7.1.17 The performance of this junction under baseline flows is summarised in Table 7.8.

Table 7.8 North Hyde Gardens/North Hyde Road/Watersplash Lane & North Hyde Road / Hayes Bypass / Hayes Road signalised roundabout – Baseline 2014

Approach	AM Peak		PM Peak	
	DoS	Queue	DoS	Queue
Bulls Bridge Roundabout				
Hayes Road Eastbound nearside	66	5	88	10
Hayes Road Eastbound lane 2	50	2	85	8
Hayes Road Eastbound lane 3	11	0	38	2
The Parkway Southbound nearside	85	13	84	15
The Parkway Southbound lane 2	86	13	86	16
The Parkway Southbound lane 3	87	13	58	7
Hayes Road Westbound nearside	67	4	77	8
Hayes Road Westbound lane 2	65	4	31	2
Hayes Road Westbound lane 3	62	4	76	8
Hayes Road Westbound lane 4	29	2	65	5
The Parkway Northbound nearside	73	10	86	15
The Parkway Northbound lane 2	75	10	86	15
The Parkway Northbound lane 3	68	9	87	16
The Parkway Northbound lane 4	72	10	58	7
North Hyde Rd/ North Hyde Gardens				
North Hyde Gardens Southbound	8	1	15	1
Watersplash Lane	9	0	9	0
North Hyde Rd Eastbound	88	17	84	15
North Hyde Rd Westbound nearside	47	2	57	7
North Hyde Rd Westbound Right turn	13	0	3	0
Internal Links				
Internal Eastbound nearside	32	3	32	3
Internal Eastbound lane 2	27	3	44	4
Internal Eastbound lane 3	34	4	47	4
Internal Eastbound lane 4	9	1	25	0
Internal southbound nearside	32	1	61	3
Internal southbound lane 2	46	3	56	2
Internal southbound lane 3	44	2	33	2
Internal southbound lane 4	13	0	26	0
Internal westbound nearside	39	4	54	6
Internal westbound lane 2	31	5	49	1
Internal westbound lane 3	16	2	45	1
Internal northbound nearside	71	5	57	1
Internal northbound lane 2	65	4	69	5
Internal northbound lane 3	61	4	77	4
Internal northbound lane 4	51	1	46	3

- 7.1.18 It can be seen from Table 7.8 that this junction operates within the capacity during both the morning and evening peak periods when green times and offsets are optimised manually within TRANSYT to reflect how SCOOT would operate with the increased traffic flow. Reference back to Section 2.5 of this report shows that the junction is currently observed to have some capacity problems, but this is due to the signal timings that have been applied and can be resolved by optimising the green times within the existing observed cycle times, as demonstrated above.

Baseline 2024

- 7.1.19 Each of the junction assessed in Section 2 of this report have also been re-assessed using the 2024 Baseline traffic flows. Full outputs of each of the baseline model results can be seen in Appendix M. The following paragraphs describe the results of these models under 2024 Baseline flows.

Dawley Road/Blyth Road/Kestral Way/Betam Road Roundabout

- 7.1.20 This is an existing five-arm roundabout. The performance of this junction under Baseline 2024 flows is summarised in Table 7.9.

Table 7.9 Dawley Road/Blyth Road/Kestral Way/Betam Road Roundabout - Baseline 2024

ARM	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
Dawley Road (N)	0.762	3	0.581	1
Blyth Road	1.030	21	0.888	7
Dawley Road (S)	0.851	5	0.833	5
Kestral Way	0.113	0	0.318	1
Betam Road	0.068	0	0.168	0

- 7.1.21 It can be seen from Table 7.9 that this junction is would have capacity problems under 2024 Baseline flows. In the morning peak the Blyth Road approach would be over-capacity with Dawley Road South operating at capacity, whilst the Blyth Road approach is also over capacity in the PM peak.

Dawley Road/North Hyde Road/Millington Road/Bourne Avenue Roundabout

- 7.1.22 This is an existing five-arm roundabout. The performance of this junction under Baseline 2024 flows is summarised in Table 7.10.

Table 7.10 Dawley Road/North Hyde Road/Millington Road/Bourne Avenue Roundabout - Baseline 2024

ARM	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
Dawley Road (N)	0.858	6	0.823	5
North Hyde Road	0.714	2	0.679	2
Millington Road	0.059	0	0.433	1
Dawley Road (S)	0.859	6	0.860	6
Bourne Avenue	0.846	5	0.555	1

- 7.1.23 It can be seen from Table 7.10 that this junction is beginning to have capacity problems under Baseline 2024 flows. In the morning peak the Dawley Road North approach and Dawley Road

South approach would be marginally over-capacity with Bourne Avenue at capacity, whilst the Dawley Road South approach is also marginally over capacity in the PM peak.

Dawley Road/Station Road/Shepiston Lane mini-roundabout

- 7.1.24 This is an existing three-arm mini-roundabout. The performance of this junction under Baseline 2024 flows is summarised in Table 7.11.

Table 7.11 Dawley Road/Station Road/Shepiston Lane mini-roundabout – Baseline 2024

ARM	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
Dawley Road (N)	0.783	4	0.754	3
Station Road	0.727	3	0.654	2
Shepiston Lane	0.700	2	0.793	4

- 7.1.25 It can be seen from Table 7.11 that this junction operates within capacity under anticipated Baseline 2024 traffic flows, with RFC's below 0.85 on all arms and minimal queuing taking place.

North Hyde Road/Millington Road priority junction

- 7.1.26 This is an existing three-arm priority junction. The performance of this junction under Baseline 2024 flows is summarised in Table 7.12.

Table 7.12 North Hyde Road/Millington Road priority junction – Baseline 2024

ARM	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
Millington Road right turn	0.027	0	0.168	0
North Hyde Road (W) right turn	0.014	0	0.013	0

- 7.1.27 It can be seen from Table 7.12 that this junction operates within capacity under anticipated Baseline 2024 traffic flows, with RFC's below 0.85 on all arms and minimal queuing taking place.

Station Road /Millington Road/ Bedwell Gardens priority junction

- 7.1.28 This is an existing four-arm priority junction. The performance of this junction under Baseline 2024 flows is summarised in Table 7.13.

Table 7.13 Station Road /Millington Road/ Bedwell Gardens priority junction – Baseline 2024

ARM	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
Millington Road right turn	0.098	0	0.252	0
Station Road (S) right turn	0.063	0	0.056	0
Bedwell Gardens right turn	0.463	1	0.232	0
Station Road (N) right turn	0.134	0	0.036	0

- 7.1.29 It can be seen from Table 7.13 that this junction operates within capacity under anticipated Baseline 2024 traffic flows, with RFC's below 0.85 on all arms and minimal queuing taking place.

North Hyde Road / Station Road signal junction

- 7.1.30 This is an existing four-arm signalised junction. The performance of this junction under Baseline 2024 flows is summarised in Table 7.14.

Table 7.14 North Hyde Road / Station Road signals junction – Baseline 2024

Link	ARM	AM Peak (82s)		PM Peak (85s)	
		DoS	Queue	DoS	Queue
1/1	Station Rd S Left Ahead	82.3	11.1	62.1	8.8
1/2	Station Rd S Right	92.8	6.9	123.6	34.4
2/1	Station Rd N Right	81.4	4.6	40.9	2.5
2/2	Station Rd N Left Ahead	107.2	39.1	79.9	13.7
3/1	N Hyde Rd W Ahead Left	75.2	9.1	119.2	46.9
3/2	N Hyde Rd W Right	45.0	1.8	33.1	1.4
4/1	N Hyde Rd E Left Ahead	111.8	64.5	122.9	82.9
4/2	N Hyde Rd E Right	37.7	2.5	97.8	11.7
PRC		-24.3%		-37.3%	

- 7.1.31 It can be seen from Table 7.14 that by 2024 the capacity problem at this junction worsen. In the morning peak hour there would be a capacity problem on the Station Road South right turn lane, with a degree of saturation over 90% under Baseline 2024 background traffic flows. For Station Road North left and ahead lane and North Hyde Road East left and ahead lane, there are also a capacity problem with degrees of saturation over 100%. The PRC for the junction during the morning peak is -24.3%.
- 7.1.32 In the PM peak both the Station Road South right turn lane, North Hyde Road West ahead and left lane as well as North Hyde Rd East left and ahead lane are over-capacity, with degree of saturation of over 115%. North Hyde Rd East right turn lane also operates over capacity with a degree of saturation of over 95%. The PRC for the junction during the morning peak is -37.3%.

High Street / Station Road signal junction

- 7.1.33 This is an existing three-arm signalised junction. The existing cycle time measured on the day of the traffic survey has been maintained but the green times were optimised manually using LINSIG. The performance of this junction under Baseline 2024 flows is summarised in Table 7.15.

Table 7.15 High Street / Station Road signal junction – 2024 Baseline

Link	ARM	AM Peak (56s)		PM Peak (56s)	
		DoS	Queue	DoS	Queue
1/1	Station Road (N) Ahead	77.3	10.1	48.9	5.0
1/2	Station Road (N) Right	66.0	4.8	61.7	4.3
2/1	High Street (S) Ahead Left	86.6	12.3	88.5	15.4
3/1	Station Road (W) Left Right	87.4	11.2	91.8	12.0
PRC		3.0%		-2.0%	

- 7.1.34 It can be seen from Table 7.15 that this junction operates within capacity during the AM peak under the Baseline 2024 flows with the green times optimised manually. In the PM peak, the

junction operates above capacity with the Station Road West left and right lane operating with a Dos of 91.8% and a PRC of -2.0% with the green times optimised manually.

*North Hyde Gardens/North Hyde Road/Watersplash Lane & North Hyde Road / Hayes Bypass / Hayes Road
signalised roundabout*

7.1.35 This is an existing four-arm signalised junction and four-arm signalised roundabout. For the Baseline 2024 traffic flows the existing cycle time is maintained. The green times and offsets are optimised manually, to reflect how SCOOT would operate, with the increased traffic flows.

7.1.36 The performance of this junction under Baseline 2024 flows is summarised in Table 7.16.

Table 7.16 North Hyde Gardens/North Hyde Road/Watersplash Lane & North Hyde Road / Hayes Bypass / Hayes Road signalised roundabout – Baseline 2024

Approach	AM Peak		PM Peak	
	DoS	Queue	DoS	Queue
Bulls Bridge Roundabout				
Hayes Road Eastbound nearside	76	10	101	20
Hayes Road Eastbound lane 2	57	5	91	11
Hayes Road Eastbound lane 3	13	1	38	2
The Parkway Southbound nearside	88	16	89	18
The Parkway Southbound lane 2	83	13	91	18
The Parkway Southbound lane 3	88	15	94	20
Hayes Road Westbound nearside	78	6	86	11
Hayes Road Westbound lane 2	86	8	75	8
Hayes Road Westbound lane 3	85	8	62	6
Hayes Road Westbound lane 4	39	2	52	4
The Parkway Northbound nearside	73	11	99	30
The Parkway Northbound lane 2	75	11	99	29
The Parkway Northbound lane 3	69	10	94	22
The Parkway Northbound lane 4	72	10	65	9
North Hyde Rd/ North Hyde Gardens				
North Hyde Gardens Southbound	12	1	24	2
Watersplash Lane	9	0	9	0
North Hyde Rd Eastbound	90	20	80	15
North Hyde Rd Westbound nearside	54	10	66	7
North Hyde Rd Westbound Right turn	18	1	5	0
Internal Links				
Internal Eastbound nearside	42	4	38	4
Internal Eastbound lane 2	34	3	50	4
Internal Eastbound lane 3	47	4	52	4
Internal Eastbound lane 4	12	0	25	0
Internal southbound nearside	39	1	54	2
Internal southbound lane 2	48	1	66	4
Internal southbound lane 3	47	1	58	3
Internal southbound lane 4	14	0	31	0
Internal westbound nearside	48	3	94	16
Internal westbound lane 2	44	1	44	1
Internal westbound lane 3	21	0	39	1
Internal northbound nearside	82	5	67	3
Internal northbound lane 2	82	5	86	7
Internal northbound lane 3	65	6	88	6
Internal northbound lane 4	58	1	55	4

7.1.37 It can be seen from Table 7.16 that this junction operates at capacity during the AM peak Baseline 2024 traffic flows when the green times and offsets are optimised manually using TRANSYT, to reflect how SCOOT would operate with the increase traffic flows. During the PM peak the degree of saturation exceeds 90% on numerous approaches and internal queues on the Bulls Bridge Roundabout exceed 5 PCUs on more than one approach.

7.2 Development Impact

Baseline 2014 With Developments

- 7.2.1 In order to assess the level of impact arising from the development traffic, the models within Section 7.1 have been run again using the 2014 With Development flows (HPH 5 and HPH 4 & 5). The signal models have been run with the same timings applied as in the baseline models. The results of these model runs are shown in full in Appendix N and summarised in Table 7.17 to Table 7.25.

Table 7.17 Dawley Road/Blyth Road/Kestral Way/Betam Road Roundabout -2014 With Development

ARM	AM Peak				PM Peak			
	HPH 5		HPH 4 & 5		HPH 5		HPH 4 & 5	
	RFC	Q	RFC	Q	RFC	Q	RFC	Q
Dawley Road (N)	0.653	2	0.658	2	0.491	1	0.492	1
Blyth Road	0.790	4	0.795	4	0.689	2	0.690	2
Dawley Road (S)	0.733	3	0.734	3	0.725	3	0.730	3
Kestral Way	0.084	0	0.084	0	0.234	0	0.236	0
Betam Road	0.052	0	0.052	0	0.125	0	0.126	0

- 7.2.2 It can be seen from Table 7.17 that this junction operates within capacity under all anticipated 2014 With Development traffic flows in all development scenario, with RFC's below 0.85 on all arms and minimal queuing taking place.

Table 7.18 Dawley Road/North Hyde Road/Millington Road/Bourne Avenue Roundabout -2014 With Development

ARM	AM Peak				PM Peak			
	HPH 5		HPH 4 & 5		HPH 5		HPH 4 & 5	
	RFC	Q	RFC	Q	RFC	Q	RFC	Q
Dawley Road (N)	0.756	3	0.767	3	0.707	2	0.708	2
North Hyde Road	0.605	2	0.615	2	0.555	1	0.556	1
Millington Road	0.056	0	0.064	0	0.413	1	0.477	1
Dawley Road (S)	0.765	3	0.794	4	0.727	3	0.734	3
Bourne Avenue	0.665	2	0.684	2	0.425	1	0.429	1

- 7.2.3 It can be seen from Table 7.18 that this junction operates within capacity under anticipated all 2014 With Developments traffic flows in all development scenario, with RFC's below 0.85 on all arms and minimal queuing taking place.

Table 7.19 Dawley Road/Station Road/Shepiston Lane mini-roundabout – 2014 With Development

ARM	AM Peak				PM Peak			
	HPH 5		HPH 4 & 5		HPH 5		HPH 4 & 5	
	RFC	Q	RFC	Q	RFC	Q	RFC	Q
Dawley Road (N)	0.678	2	0.680	2	0.680	2	0.702	2
Station Road	0.594	1	0.596	2	0.548	1	0.558	1
Shepiston Lane	0.640	2	0.669	2	0.664	2	0.670	2

- 7.2.4 It can be seen from Table 7.19 that this junction operates within capacity under all anticipated 2014 With Development traffic flows, with RFC's below 0.85 on all arms and minimal queuing taking place.

Table 7.20 North Hyde Road/Millington Road priority junction – 2014 With Development

ARM	AM Peak				PM Peak			
	HPH 5		HPH 4 & 5		HPH 5		HPH 4 & 5	
	RFC	Q	RFC	Q	RFC	Q	RFC	Q
Millington Road right turn	0.048	0	0.060	0	0.315	1	0.407	1
North Hyde Road (W) right turn	0.011	0	0.012	0	0.011	0	0.011	0

- 7.2.5 It can be seen from Table 7.20 that this junction operates within capacity under all anticipated 2014 With Development traffic flows, with RFC's below 0.85 on all arms and minimal queuing taking place.

Table 7.21 Station Road /Millington Road/ Bedwell Gardens priority junction – 2014 With Development

ARM	AM Peak				PM Peak			
	HPH 5		HPH 4 & 5		HPH 5		HPH 4 & 5	
	RFC	Q	RFC	Q	RFC	Q	RFC	Q
Millington Road right turn	0.094	0	0.097	0	0.254	0	0.269	0
Station Road (S) right turn	0.052	0	0.052	0	0.046	0	0.046	0
Bedwell Gardens right turn	0.356	1	0.356	1	0.177	0	0.177	0
Station Road (N) right turn	0.130	0	0.130	0	0.034	0	0.034	0

- 7.2.6 It can be seen from Table 7.21 that this junction operates within capacity under all anticipated 2014 With Development traffic flows, with RFC's below 0.85 on all arms and minimal queuing taking place.

Table 7.22 North Hyde Road / Station Road signals junction – 2014 With Development

Link	ARM	AM Peak (82s)				PM Peak (85s)			
		HPH 5		HPH 4 & 5		HPH 5		HPH 4 & 5	
		DoS	Q	DoS	Q	DoS	Q	DoS	Q
1/1	Station Rd S Left Ahead	74.2	8.9	77.8	9.4	59.5	7.7	59.5	7.7
1/2	Station Rd S Right	80.9	4.5	80.9	4.5	104.6	15.9	104.6	15.9
2/1	Station Rd N Right	71.9	3.6	76.3	4.0	36.9	2.3	36.9	2.3
2/2	Station Rd N Left Ahead	98.3	20.6	103.0	27.3	76.2	11.7	76.2	11.7
3/1	N Hyde Rd W Ahead Left	64.7	7.5	62.6	7.4	101.6	21.9	108.3	33.0
3/2	N Hyde Rd W Right	39.3	1.5	39.3	1.5	28.3	1.1	28.3	1.1
4/1	N Hyde Rd E Left Ahead	101.6	33.3	101.9	35.0	96.5	21.2	97.4	22.2
4/2	N Hyde Rd E Right	26.5	1.9	25.3	1.9	86.7	6.4	86.7	6.4
PRC		-12.9%		-14.4%		-16.3%		-20.3%	

- 7.2.7 It can be seen that in the morning peak hour there is a capacity problem on the Station Road North left and ahead lane and North Hyde Road East left and ahead lane, with a degree of saturation over 90% for both lanes for all development scenario. The worst PRC of the junction in the morning peak is -14.4% under the Baseline with Full Development scenario.
- 7.2.8 In the PM peak both the Station Road South right turn lane, North Hyde Road West ahead and left land and North Hyde Rd East left and ahead lane are over-capacity under all development scenario. The worst PRC of the junction in the morning peak is -20.3% under the Baseline with Full Development scenario.
- 7.2.9 The same links have degrees of saturation in excess of 90% as occur in the 2014 Baseline tests. Table 7.23 sets out the actual increase in queuing on these links between the Baseline and With Development scenarios.

Table 7.23 North Hyde Road / Station Road signals junction – 2014 With Development impact comparison queues

Link	ARM	AM Peak (82s)			PM Peak (85s)		
		Baseline	HPH 5	HPH 4 & 5	Baseline	HPH 5	HPH 4 & 5
1/2	Station Rd S Right				10	+5.9	+5.9
2/2	Station Rd N Left Ahead	17	+3.6	+10.3			
3/1	N Hyde Rd W Ahead Left				13.7	+8.2	+19.3
4/1	N Hyde Rd E Left Ahead	24.6	+8.7	+10.4	23.6	+5.9	

- 7.2.10 Table 7.23 summarised the increase in queues at the junction when compared to the Baseline scenario during the AM and PM peak. The NPPF clearly identifies that planning consent should only be refused where severe residual impact occurs. With HPH 5 in place, the impact on this junction cannot be considered as severe. The combined impact of the two sites is beginning to have more significant impacts and mitigation should be considered for this scenario.

Table 7.24 High Street / Station Road signals junction – 2014 With Development

Link	ARM	AM Peak (56s)				PM Peak (56s)			
		HPH 5		HPH 4 & 5		HPH 5		HPH 4 & 5	
		DoS	Q	DoS	Q	DoS	Q	DoS	Q
1/1	Station Road (N) Ahead	67.5	7.9	67.6	7.9	43.1	4.1	43.5	4.2
1/2	Station Road (N) Right	57.3	4.0	57.3	4.0	53.2	3.6	53.2	3.6
2/1	High Street (S) Ahead Left	76.2	9.4	76.9	9.7	76.7	11.5	76.7	11.5
3/1	Station Road (W) Left Right	75.5	7.9	75.5	7.9	79.1	7.8	79.1	7.8
PRC		18.1%		17.0%		13.8%		13.8%	

7.2.11 It can be seen from Table 7.24 that this junction operates within capacity with degrees of saturation below 90% for all arms.

Table 7.25 North Hyde Gardens/North Hyde Road/Watersplash Lane & North Hyde Road / Hayes Bypass / Hayes Road signalised roundabout – 2014 With Development

Approach	AM Peak				PM Peak			
	HPH 5		HPH 4&5		HPH 5		HPH 4&5	
	DoS	Q	DoS	Q	DoS	Q	DoS	Q
Bulls Bridge Roundabout								
Hayes Road Eastbound nearside	66	5	66	5	89	10	90	11
Hayes Road Eastbound lane 2	51	2	50	2	97	14	87	9
Hayes Road Eastbound lane 3	11	0	12	0	38	2	39	2
The Parkway Southbound nearside	87	14	88	15	84	15	85	16
The Parkway Southbound lane 2	85	13	88	14	86	16	87	16
The Parkway Southbound lane 3	88	14	87	13	59	7	57	7
Hayes Road Westbound nearside	67	4	67	4	77	8	77	8
Hayes Road Westbound lane 2	66	4	65	4	31	2	31	2
Hayes Road Westbound lane 3	63	4	65	4	76	8	76	8
Hayes Road Westbound lane 4	30	2	29	2	65	5	65	5
The Parkway Northbound nearside	75	10	74	10	86	15	88	16
The Parkway Northbound lane 2	75	10	76	10	86	15	86	15
The Parkway Northbound lane 3	68	9	69	9	87	17	86	16
The Parkway Northbound lane 4	72	10	73	10	58	7	58	7
North Hyde Rd/ North Hyde Gardens								
North Hyde Gardens Southbound	8	1	8	1	15	1	17	1
Watersplash Lane	9	0	9	0	9	0	9	0
North Hyde Rd Eastbound	88	17	89	18	90	18	84	16
North Hyde Rd Westbound nearside	50	2	51	2	58	7	58	4
North Hyde Rd Westbound Right turn	13	0	13	1	4	0	4	0
Internal Links								
Internal Eastbound nearside	32	3	31	3	29	3	31	3
Internal Eastbound lane 2	28	3	27	3	48	4	49	4
Internal Eastbound lane 3	34	4	35	4	50	4	50	4
Internal Eastbound lane 4	9	1	9	1	25	0	27	0
Internal southbound nearside	33	1	32	1	62	3	62	3
Internal southbound lane 2	46	3	46	2	56	3	59	4
Internal southbound lane 3	43	2	43	1	33	2	31	2
Internal southbound lane 4	15	0	16	0	27	0	27	0
Internal westbound nearside	42	5	43	5	54	6	54	6
Internal westbound lane 2	32	5	33	5	50	1	50	1
Internal westbound lane 3	16	2	16	2	45	1	45	1
Internal northbound nearside	71	2	72	5	57	1	59	1
Internal northbound lane 2	65	4	67	5	69	5	68	4
Internal northbound lane 3	61	5	59	4	77	4	80	5
Internal northbound lane 4	51	1	51	1	46	3	47	3

7.2.12 For the 2014 With Development traffic flows the existing cycle time is maintained. The green times and offsets are optimised manually, to reflect how SCOOT would operate, with the increased traffic flows. It can be seen from Table 7.25 that this junction operates at below 90% degree of saturation and all internal queues do not exceed 5 PCUs.

Baseline 2024 With Developments

- 7.2.13 In order to assess the level of impact arising from the development traffic, the models within Section 7.1 have been run again using the 2024 With Development flows (HPH 5 and HPH 4 & 5). The signal models have been run with the same timings applied as in the baseline models. The results of these model runs are shown in full in Appendix O and summarised in Table 7.26 to Table 7.36.

Table 7.26 Dawley Road/Blyth Road/Kestral Way/Betam Road Roundabout -2024 With Development

ARM	AM Peak				PM Peak			
	HPH 5		HPH 4 & 5		HPH 5		HPH 4 & 5	
	RFC	Q	RFC	Q	RFC	Q	RFC	Q
Dawley Road (N)	0.771	3	0.776	3	0.583	1	0.584	1
Blyth Road	1.045	24	1.054	25	0.890	7	0.891	7
Dawley Road (S)	0.851	5	0.852	5	0.844	5	0.851	5
Kestral Way	0.113	0	0.113	0	0.323	1	0.326	1
Betam Road	0.068	0	0.068	0	0.170	0	0.172	0

- 7.2.14 This junction has capacity problems under 2024 Baseline flows and it can be seen from Table 7.26 that this remains the case under all 2024 Baseline With Development flows. In the morning peak the Blyth Road approach would be over-capacity with Dawley Road South at capacity.
- 7.2.15 When the Full Development results are compared with the Baseline, it can be seen the impact from the proposed development is minimal. In the AM peak Blyth Road's queue length increased by 3 PCUs with the RFC increased by 0.024. The impact of HPH 5 alone is even smaller at an increase queue of 2 PCUs.
- 7.2.16 In the PM peak, the Blyth Road approach also operates over capacity. But again when the impact of the With Full Development is compared with the Baseline, it can be seen the impact from the proposed development is minimal. Queue length at Blyth Road do not increase, with the RFC increased marginally by 0.003. The increase in RFC is even smaller with just HPH 5 in place at 0.002.
- 7.2.17 It is therefore considered that the cumulative impact of development on this junction is insignificant and does not warrant any mitigation.

Table 7.27 Dawley Road/North Hyde Road/Millington Road/Bourne Avenue Roundabout -2024 With Development

ARM	AM Peak				PM Peak			
	HPH 5		HPH 4 & 5		HPH 5		HPH 4 & 5	
	RFC	Q	RFC	Q	RFC	Q	RFC	Q
Dawley Road (N)	0.883	7	0.896	8	0.828	5	0.830	5
North Hyde Road	0.739	3	0.752	3	0.683	2	0.685	2
Millington Road	0.077	0	0.088	0	0.599	1	0.682	2
Dawley Road (S)	0.918	9	0.947	12	0.876	6	0.885	7
Bourne Avenue	0.898	7	0.924	8	0.567	1	0.573	1

- 7.2.18 This junction is marginally over-capacity under 2024 Baseline flows and it can be seen from Table 7.27 that the same can be said under all 2024 Baseline With Development scenarios. In the morning peak the Dawley Road North and Dawley Road South and Bourne Avenue approach would be over-capacity, whilst the Dawley Road South approach operates slightly over capacity with an RFC below 0.9 in the evening peak.
- 7.2.19 When the Full Development is compared with the Baseline, it can be seen the impact from the proposed development is minimal. In the AM peak Dawley Road North approach's queue length increased by 2 PCUs with the RFC increased by 0.038. Dawley Road South approach's queue length increased by 6 PCUs with the RFC increased by 0.088. Bourne Avenue's queue length increased by 3 PCUs with the RFC increased by 0.079. With just HPH 5 in place the queue increases are smaller at 1, 3 and PCUs respectively.
- 7.2.20 In the PM peak when the Full Development scenario is compared with the Baseline, it can be seen the impact from the proposed development is minimal. Queue lengths at Dawley Road South increased by 1 PCU, with the RFC increased marginally by 0.025 (with no increase at all for HPH 5 alone). It is therefore considered that the cumulative impact of development on this junction is insignificant and does not warrant mitigation.

Table 7.28 Dawley Road/Station Road/Shepiston Lane mini-roundabout – 2024 With Development

ARM	AM Peak				PM Peak			
	HPH 5		HPH 4 & 5		HPH 5		HPH 4 & 5	
	RFC	Q	RFC	Q	RFC	Q	RFC	Q
Dawley Road (N)	0.789	4	0.792	4	0.795	4	0.817	4
Station Road	0.732	3	0.733	3	0.678	2	0.691	2
Shepiston Lane	0.759	3	0.791	4	0.805	4	0.811	4

- 7.2.21 It can be seen from the above that this junction operates within capacity under the all anticipated 2024 Baseline With Full development traffic flows, with RFC's below 0.85 on all arms and minimal queuing taking place.

Table 7.29 North Hyde Road/Millington Road priority junction – 2024 With Development

ARM	AM Peak				PM Peak			
	HPH 5		HPH 4 & 5		HPH		HPH 4 & 5	
	RFC	Q	RFC	Q	RFC	Q	RFC	Q
Millington Road right turn	0.053	0	0.070	0	0.364	1	0.469	1
North Hyde Road (W) right turn	0.014	0	0.015	0	0.013	0	0.013	0

- 7.2.22 It can be seen from Table 7.29 that this junction operates within capacity under the all anticipated 2024 Baseline with Full Development traffic flows, with RFC's below 0.85 on all arms and minimal queuing taking place.

Table 7.30 Station Road /Millington Road/ Bedwell Gardens priority junction – 2024 With Development

ARM	AM Peak				PM Peak			
	HPH 5		HPH 4 & 5		HPH 5		HPH 4 & 5	
	RFC	Q	RFC	Q	RFC	Q	RFC	Q
Millington Road right turn	0.102	0	0.105	0	0.278	0	0.295	0
Station Road (S) right turn	0.063	0	0.063	0	0.056	0	0.056	0
Bedwell Gardens right turn	0.463	1	0.463	1	0.232	0	0.232	0
Station Road (N) right turn	0.134	0	0.134	0	0.036	0	0.036	0

7.2.23 It can be seen from Table 7.30 that this junction operates within capacity under all the anticipated 2024 Baseline With Development traffic flows, with RFC's below 0.85 on all arms and minimal queuing taking place.

Table 7.31 North Hyde Road / Station Road signals junction – 2024 With Development

Link	ARM	AM Peak (82s)				PM Peak (85s)			
		HPH 5		HPH 4 & 5		HPH 5		HPH 4 & 5	
		DoS	Q	DoS	Q	DoS	Q	DoS	Q
1/1	Station Rd S Left Ahead	86.0	11.9	90.1	13.2	62.1	8.8	80.2	10.9
1/2	Station Rd S Right	92.8	7.0	92.8	7.0	123.6	34.4	152.9	54.4
2/1	Station Rd N Right	82.6	4.8	83.1	4.9	41.2	2.5	77.9	4.0
2/2	Station Rd N Left Ahead	112.1	49.7	117.4	61.0	79.9	13.7	103.2	30.5
3/1	N Hyde Rd W Ahead Left	73.5	9.1	71.0	8.9	134.4	74.5	98.8	21.0
3/2	N Hyde Rd W Right	45.0	1.7	45.0	1.7	33.1	1.4	33.1	1.2
4/1	N Hyde Rd E Left Ahead	115.2	78.9	115.2	80.9	124.5	87.9	97.9	25.3
4/2	N Hyde Rd E Right	36.2	2.5	34.0	2.4	97.8	11.7	97.8	10.2
PRC		-28.1		-30.5		-49.4		-69.9	

7.2.24 It can be seen from Table 7.31 that development traffic adds to the capacity problem at this junction. In the morning peak hour there is a capacity problem on the Station Road North left and ahead lane and North Hyde Road East left and ahead lane, with a degree of saturation over 90% for both lanes for all development scenario. The worst PRC in the morning peak is -30.5% under the Baseline With Full Development scenario.

7.2.25 In the PM peak both the Station Road South right turn lane, North Hyde Road West ahead and North Hyde Rd East left and ahead lane are over-capacity under all development scenario. The worst PRC in the evening peak is -69.9% under the Baseline With Full Development scenario.

Table 7.32 North Hyde Road / Station Road signal junction – 2024 Wth Development impact comparison Queue

Link	ARM	AM Peak (82s)			PM Peak (85s)		
		Baseline	HPH 5	HPH 4 & 5	Baseline	HPH 5	HPH 4 & 5
1/2	Station Rd S Right	6.9	+0.1	+0.1	34.4	+0.0	+20.0
2/2	Station Rd N Left Ahead	39.1	+10.6	+21.9	13.7		+16.8
3/1	N Hyde Rd W Ahead Left	9.1			46.9	+27.6	
4/1	N Hyde Rd E Left Ahead	64.5	+14.4	+16.4	82.9	+5.0	

- 7.2.26 It is considered that all With Development scenarios are beginning to have more significant impacts and mitigation by 2024 should be considered.

Table 7.33 High Street / Station Road signal junction – 2024 With Development

Link	ARM	AM Peak (56s)				PM Peak (56s)			
		HPH 5		HPH 4 & 5		HPH 5		HPH 4 & 5	
		DoS	Q	DoS	Q	DoS	Q	DoS	Q
1/1	Station Road (N) Ahead	77.4	10.1	77.5	10.1	49.8	5.1	50.3	5.1
1/2	Station Road (N) Right	66.0	4.8	66.0	4.8	61.7	4.3	61.7	4.3
2/1	High Street (S) Ahead Left	87.8	12.8	88.4	13.0	88.7	15.5	88.7	15.5
3/1	Station Road (W) Left Right	87.4	11.2	87.4	11.2	91.8	12.0	91.8	12.0
PRC		2.5%		1.8%		-2.0%		-2.0%	

- 7.2.27 It can be seen from Table 7.33 that this junction operates within capacity during the AM peak. In the PM peak the degree of saturation of the Station Road West arm goes up to above 91.8%. The PRC in the PM peak is -2.0%.

Table 7.34 High Street / Station Road signals junction – 2024 With Development impact comparison Queues

Link	ARM	PM Peak (56s)		
		Baseline	HPH 5	HPH 4 & 5
3/1	Station Road (W) Left Right	12.0	0	0

- 7.2.28 Table 7.34 summarised the increase in queue at the junction when compared to the Baseline scenario during the PM peak. The NPPF clearly identifies that planning consent should only be refused where severe residual impact occurs. With HPH 5 or the combine development in place, the impact on this junction cannot be considered as severe.

Table 7.35 North Hyde Gardens/North Hyde Road/Watersplash Lane & North Hyde Road / Hayes Bypass / Hayes Road signalised roundabout – 2024 with Development

Approach	AM Peak				PM Peak			
	HPH 5		HPH 4&5		HPH 5		HPH 4&5	
	DoS	Q	DoS	Q	DoS	Q	DoS	Q
Bulls Bridge Roundabout								
Hayes Road Eastbound nearside	76	10	76	8	100	20	101	22
Hayes Road Eastbound lane 2	58	5	58	4	103	22	90	11
Hayes Road Eastbound lane 3	13	1	13	1	38	2	42	3
The Parkway Southbound nearside	88	16	88	16	89	18	90	18
The Parkway Southbound lane 2	83	13	85	14	91	18	91	18
The Parkway Southbound lane 3	89	16	89	16	94	21	93	20
Hayes Road Westbound nearside	78	6	78	6	86	11	86	10
Hayes Road Westbound lane 2	86	8	86	8	74	8	82	9
Hayes Road Westbound lane 3	88	9	90	10	63	6	67	6
Hayes Road Westbound lane 4	39	2	39	2	52	4	53	4
The Parkway Northbound nearside	75	11	76	11	99	30	97	25
The Parkway Northbound lane 2	75	11	79	12	99	29	103	38
The Parkway Northbound lane 3	69	10	72	11	94	22	94	22
The Parkway Northbound lane 4	73	11	76	11	65	9	65	9
North Hyde Rd/ North Hyde Gardens								
North Hyde Gardens Southbound	12	1	12	1	24	2	23	2
Watersplash Lane	9	0	9	0	9	0	9	0
North Hyde Rd Eastbound	90	20	91	20	84	17	89	19
North Hyde Rd Westbound nearside	57	11	58	8	66	8	67	9
North Hyde Rd Westbound Right turn	18	1	18	1	5	0	5	0
Internal Links								
Internal Eastbound nearside	41	4	41	4	34	4	36	4
Internal Eastbound lane 2	35	3	36	4	53	5	53	5
Internal Eastbound lane 3	47	4	46	4	53	4	51	5
Internal Eastbound lane 4	12	0	12	0	25	0	30	1
Internal southbound nearside	40	1	39	1	55	3	63	3
Internal southbound lane 2	47	1	48	2	66	4	64	3
Internal southbound lane 3	47	1	46	1	57	3	57	3
Internal southbound lane 4	16	0	17	0	31	0	31	0
Internal westbound nearside	51	4	50	4	94	15	94	16
Internal westbound lane 2	45	1	45	0	45	1	45	1
Internal westbound lane 3	21	0	20	0	39	1	38	1
Internal northbound nearside	81	3	82	6	67	3	71	4
Internal northbound lane 2	82	5	79	5	86	7	86	6
Internal northbound lane 3	65	6	67	6	88	6	90	7
Internal northbound lane 4	59	1	59	1	55	4	57	4

7.2.29 For the 2024 With Development traffic flows the existing cycle time is maintained. The green times and offsets are optimised manually, to reflect how SCOOT would operate, with the increased traffic flows. It can be seen from Table 7.35 that during the AM peak, under the With HPH 5 scenario the network operates within capacity. For the With Full Development scenario, the network operates within capacity apart from North Hyde Road Eastbound lane at the North Hyde Road/North Hyde Gardens' junction with DoS of 91%.

7.2.30 During the PM peak, it can be seen that network experiences capacity problems. The DoS exceeds 90% on a number of approaches and internal queues on the Bulls Bridge Roundabout exceed 5 PCUs.

Table 7.36 North Hyde Gardens/North Hyde Road/Watersplash Lane & North Hyde Road / Hayes Bypass / Hayes Road signalised roundabout – 2024 With Full Development impact caparison

Approach	AM Peak				PM Peak			
	Baseline		HPH 4&5		Baseline		HPH 4&5	
	DoS	Q	DoS	Q	DoS	Q	DoS	Q
Bulls Bridge Roundabout								
Hayes Road Eastbound nearside	76	10	0	-2	101	20	0	+2
Hayes Road Eastbound lane 2	57	5	+1	-1	91	11	-1	0
Hayes Road Eastbound lane 3	13	1	0	0	38	2	+4	+1
The Parkway Southbound nearside	88	16	0	0	89	18	1	0
The Parkway Southbound lane 2	83	13	+3	+2	91	18	0	0
The Parkway Southbound lane 3	88	15	-1	0	94	20	-1	0
Hayes Road Westbound nearside	78	6	0	0	86	11	0	-1
Hayes Road Westbound lane 2	86	8	0	0	75	8	+7	1
Hayes Road Westbound lane 3	85	8	+5	+2	62	6	+5	0
Hayes Road Westbound lane 4	39	2	0	0	52	4	+1	0
The Parkway Northbound nearside	73	11	+3	0	99	30	-2	-5
The Parkway Northbound lane 2	75	11	+4	+1	99	29	+4	+9
The Parkway Northbound lane 3	69	10	+3	+1	94	22	0	0
The Parkway Northbound lane 4	72	10	+4	+1	65	9	0	0
North Hyde Rd/ North Hyde Gardens								
North Hyde Gardens Southbound	12	1	0	0	24	2	-1	0
Watersplash Lane	9	0	0	0	9	0	0	0
North Hyde Rd Eastbound	90	20	+1	0	80	15	+9	+4
North Hyde Rd Westbound nearside	54	10	+4	-2	66	7	+1	+2
North Hyde Rd Westbound Right turn	18	1	0	0	5	0	0	0
Internal Links								
Internal Eastbound nearside	42	4	-1	0	38	4	-2	0
Internal Eastbound lane 2	34	3	+2	+1	50	4	+3	+1
Internal Eastbound lane 3	47	4	-1	0	52	4	-1	+1
Internal Eastbound lane 4	12	0	0	0	25	0	+5	+1
Internal southbound nearside	39	1	0	0	54	2	+9	+1
Internal southbound lane 2	48	1	0	+1	66	4	-2	-1
Internal southbound lane 3	47	1	-1	0	58	3	-1	0
Internal southbound lane 4	14	0	+3	0	31	0	0	0
Internal westbound nearside	48	3	+2	+1	94	16	0	0
Internal westbound lane 2	44	1	+1	-1	44	1	+1	0
Internal westbound lane 3	21	0	-1	0	39	1	-1	0
Internal northbound nearside	82	5	0	+1	67	3	+4	+1
Internal northbound lane 2	82	5	-3	0	86	7	0	-1
Internal northbound lane 3	65	6	+2	0	88	6	+2	+1
Internal northbound lane 4	58	1	+1	0	55	4	+2	0

- 7.2.31 It can be seen from Table 7.36 that when comparing the Baseline 2024 and 2024 With Full Developments scenario, the modelling shows that the variance in DoS is at 1% during the AM peak. For the PM peak, the maximum variance in DoS is at 4%. The NPPF clearly identifies that planning consent should only be refused where severe residual impact occurs. With the Full Development in place, the impact on this junction cannot be considered as severe.

7.3 Sensitivity Test

2014 and 2024 Baseline Sensitivity

As requested by LBH Highways, each of the junctions assessed in Section 2 of this report have been re-assessed using the Baseline 2014 and 2024 Sensitivity traffic flows. Full outputs of each of the baseline sensitivity model results can be seen in Appendices P and Q.

2014 With Full Development Sensitivity

- 7.3.1 As requested by LBH Highways, each of the junction assessed in Section 2 of this report have been re-assessed using the 2014 With Full Development Sensitivity traffic flows. Full outputs of each of the baseline sensitivity model results can be seen in Appendix R.
- 7.3.2 From the junction analysis results under 2014 With Full Development traffic flows, it is concluded that the junctions assessed are either operating within capacity or the increases in DoS or queues at the junction are not considered as severe. The only exception to this is the signal junction of North Hyde Road/Station Road.
- 7.3.3 In this location increasing the cycle time to 96 seconds would result in the junction performing better than under the 2014 Baseline Sensitivity traffic flows.

2024 With Full Development Sensitivity

- 7.3.4 LBH Highways also requested that each of the junction assessed in Section 2 of this report have been re-assessed using the 2024 With Full Development Sensitivity traffic flows. Full outputs of each of the baseline sensitivity model results can be seen in Appendix S.
- 7.3.5 From the junction analysis results under 2024 With Full Development traffic flows, it is concluded that the junctions assessed are either operating within capacity or the increases in DoS or queues at the junction are not considered as severe. The only exception to this is the signal junction of North Hyde road/Station Road.
- 7.3.6 In this location increasing the cycle time to 96 seconds would result in the junction performing better than under the 2024 Baseline Sensitivity traffic flows.

7.4 Construction traffic

- 7.4.1 The proposed construction programme is yet to be confirmed. Assumptions on the construction methodology are therefore broad at this stage and will be subject to reasonable modification during site development. Consequently, some aspects of construction movement have been based on experience of other schemes elsewhere. For example, the number of vehicles required for importing/exporting site materials will be dependent on the progress of works against the construction programme.

- 7.4.2 It is anticipated that construction will commence shortly after approval of the application. The construction period would be around 12 months.
- 7.4.3 During the construction period it is estimated that there will be approximately 30 deliveries per week. This equate to an average of about 5 deliveries per day during construction.
- 7.4.4 A Traffic Marshall will be stationed at the site entrance to oversee the entry and egress of all site traffic and to ensure that the general public are not put at any risk during these manoeuvres. Specific site access and egress arrangements will be determined with the Contractor prior to commencement of the works.
- 7.4.5 All traffic movements to the site will be strictly scheduled to ensure that there is no traffic congestion caused by waiting vehicles unable to enter the site. It is not anticipated that the construction traffic will have a significant detrimental impact to existing traffic conditions in the area.
- 7.4.6 It is anticipated that the working hours for the site enabling works and construction would be between 08:00 to 18:00 Monday to Friday, and 08:00 to 13:00 on Saturdays. However, all working hours will be agreed with LBH prior to the commencement of the works. All work outside these hours will be subject to prior agreement, and/or reasonable notice, to LBH who may impose certain restrictions. Works required outside of 'normal' hours will be restricted to exceptional circumstances and will be subject to approval by the Council.
- 7.4.7 Adequate precautions will be taken on site to prevent mud being taken onto the highway. Construction traffic entering and leaving the site will travel via designated routes provided by the Contractor and agreed with LBH.

8 Mitigation

8.1 Introduction

- 8.1.1 In the following paragraphs we consider the level of improvement that is necessary to mitigate the impact of the development traffic at North Hyde road/Station Road, the only location where improvement is justified. The output of the model runs included in this section can be seen in Appendix T.

North Hyde Road / Station Road signal junction

- 8.1.2 To mitigate for the effects of development traffic at this junction we proposed to increase the existing cycle time to 96 seconds which is compatible with UTC/Scoot control.

Table 8.1 North Hyde Road / Station Road signals junction – Baseline 2014 and 2014 With Full Development With Mitigation

Link	ARM	AM Peak				PM Peak			
		Baseline		HPH 4 & 5		Baseline		HPH 4 & 5	
		DoS	Q	DoS	Q	DoS	Q	DoS	Q
1/1	Station Rd S Left Ahead	71.0	8.6	70.8	9.9	57.4	7.6	57.0	8.4
1/2	Station Rd S Right	80.9	4.4	94.7	7.2	94.2	10.0	92.5	10.1
2/1	Station Rd N Right	63.6	3.1	64.0	3.6	35.4	2.2	36.7	2.5
2/2	Station Rd N Left Ahead	94.0	17.0	93.8	18.7	73.6	11.3	73.1	12.6
3/1	N Hyde Rd W Ahead Left	66.4	7.5	55.0	7.8	94.0	13.7	92.9	16.4
3/2	N Hyde Rd W Right	39.3	1.5	46.0	1.7	28.3	1.1	32.0	1.2
4/1	N Hyde Rd E Left Ahead	97.8	24.6	96.1	27.3	98.7	23.6	90.6	19.0
4/2	N Hyde Rd E Right	27.7	2.0	25.1	2.1	82.4	5.8	85.9	6.5
PRC		-8.6%		-6.7%		-9.7%		-3.3%	

- 8.1.3 It can be seen from Table 8.1 that by increasing the cycle time of the junction to UTC/Scoot control compatible timing to 96 seconds with the full development in place would result in the junction performing better than under the Baseline traffic flows. As a 96 seconds cycle time has been proposed in this location in conjunction with the ASDA development, which had no highway objections against it, it would be equally appropriate solution for the proposed development on HPH.
- 8.1.4 To mitigate for the effects of development traffic at this junction in year 2024, we proposed to increase the existing cycle time to 96 seconds which is compatible with UTC/Scoot control.

Table 8.2 North Hyde Road / Station Road signals junction – Baseline 2024 and 2024 With Full Development With Mitigation

Link	ARM	AM Peak				PM Peak			
		Baseline		HPH 4 & 5		Baseline		HPH 4 & 5	
		DoS	Q	DoS	Q	DoS	Q	DoS	Q
1/1	Station Rd S Left Ahead	82.3	11.1	82.1	12.6	62.1	8.8	60.4	9.6
1/2	Station Rd S Right	92.8	6.9	108.7	14.2	123.6	34.4	113.7	26.7
2/1	Station Rd N Right	81.4	4.6	97.3	8.3	40.9	2.5	41.8	2.7
2/2	Station Rd N Left Ahead	107.2	39.1	106.9	40.9	79.9	13.7	77.7	14.7
3/1	N Hyde Rd W Ahead Left	75.2	9.1	62.4	9.2	119.2	46.9	116.7	52.7
3/2	N Hyde Rd W Right	45.0	1.8	52.7	2.0	33.1	1.4	37.3	1.5
4/1	N Hyde Rd E Left Ahead	111.8	64.5	108.5	62.9	122.9	82.9	114.1	65.3
4/2	N Hyde Rd E Right	37.7	2.5	32.7	2.6	97.8	11.7	110.4	21.4
PRC		-24.3%		-20.7%		-37.3%		-29.6%	

- 8.1.5 It can be seen from Table 8.2 that by increasing the cycle time of the junction to UTC/Scoot control compatible timing to 96 seconds with the full development in place would result in the junction performing better than under the Baseline traffic flows. As a 96 seconds cycle time has been proposed in this location in conjunction with the ASDA development, which had no highway objections against it, it would be equally appropriate solution for the proposed development on HPH.

9 Impacts on Other Modes

9.1 Introduction

- 9.1.1 The combined proposals for HPH 4 and HPH 5 would generate 254 and 233 non car mode trips in the AM and PM peaks respectively. An assessment has been undertaken considering the impact of the development on the pedestrian, cycle, public transport

9.2 Pedestrian

- 9.2.1 The HPH 4 and HPH 5 development proposals are anticipated to generate 78 and 71 two-way sole purpose walking trips in the AM and PM peaks respectively. In addition a further 150 trips in the AM peak and 138 trips in the PM peak would walk between the site and the nearby public transport nodes (bus and rail).
- 9.2.2 The majority of walking trips will be short walk to the bus stops at North Hyde Road or Station Road North or Station Road South or to Hayes and Harlington rail station, which has entrances on Station Road and Station Approach.
- 9.2.3 There is an uncontrolled pedestrian crossing with tactile paving either sides and a pedestrian refuge island location along North Hyde Road immediately north of the development's junction with North Hyde Road. Pedestrians can use this facility to cross North Hyde Road. Pedestrian can also use the dedicated staggered crossing facilities incorporated within the existing signalised junction at North Hyde Road/Station Road.

9.3 Cyclists

- 9.3.1 The HPH 4 and HPH 5 development proposals are anticipated to generate 16 and 14 two-way trips in the AM and PM peaks respectively. The development proposals include secure cycle parking provisions which is in-line with the revised London Plan standards and would therefore accommodate and encourage travel by cycling.

9.4 Buses

- 9.4.1 The HPH 4 and HPH 5 development are expected to generate 26 and 24 two-way bus trips in the AM and PM peak hours respectively. Currently 50 bus services can be accessed during the peak hour, therefore the additional passengers would equate on average to less than 1 additional passenger per bus, which could be accommodated comfortably by existing services. The proposed development would therefore have no material impact on the operation of the buses within the vicinity of the site.

9.5 Rail/Underground

It is anticipated that the HPH 4 and HPH 5 development proposals would generate 114 and 105 two-way trips in the AM and PM peak respectively. Considering that there are 8 services during the peak hour this would equate on average to no more than 14 additional passengers per train. Such negligible increases in rail trips would have no material impact on the operation of the station or rail services at Hayes & Harlington Station.

10 Summary and Conclusions

10.1 Summary

10.1.1 SKM CB has been appointed by Hyde Park Hayes Ltd to provide transport consultancy services in support of the detailed planning application on the Hyde Park Hayes 5 site at Hyde Park Hayes, London Borough of Hillingdon.

10.1.2 The scheme proposed comprises of an office building which is summarised as follows:

- 13,880 sqm GFA B1 office development with 140 associated car park spaces.

10.1.3 It should be noted that an outline planning application for HPH 5 was submitted in February 2008 and was subsequently approved in May 2008. The new application is identical in scale to the previous outline consent.

10.1.4 Hyde Park Hayes Ltd will also be submitting a detailed planning application for HPH 4. The HPH 4 scheme is a 6,964 sqm GFA B1 office building with 72 associated car park spaces. This TA therefore considers the cumulative impact of both schemes.

10.1.5 The application site is within HPH, which is bounded by North Hyde Road to the north, Station Road to the east, Millington Road to the south and North Hyde Road/Dawley Road to the west. There are up to 50 bus services running within the vicinity of the development with the nearest bus stop locating immediately north of the development site along North Hyde Road. The nearest station to the site is Hayes and Harlington which is only 700m away with up to 8 trains an hour to London in the peaks.

10.1.6 The proposals will utilise the three existing vehicular accesses at Hyde Park Hayes.

10.1.7 Traffic flows have been derived for the following scenarios:

- Baseline 2014;
- Baseline 2024;
- 2014 With HPH 5;
- 2014 With Full Development;
- 2024 With HPH 5;
- 2024 With Full Development;
- Sensitivity Scenario Baseline 2014;
- Sensitivity Scenario Baseline 2024;
- Sensitivity Scenario 2014 With Full Development; and
- Sensitivity Scenario 2024 With Full Development.

10.1.8 The NPPF identifies that planning consent should only be refused where severe residual impact occurs and the impact of the following junctions cannot be considered as severe:

- Station Road/Dawley Road/Shepiston Lane roundabout;
- North Hyde Road/Millington Road West junction;
- Millington Road/Station Road junction;
- Dawley Road / Blyth Road/ Betam Road / Kestral Way Roundabout.
- Dawley Road/North Hyde Road/Millington Road/Bourne Avenue Roundabout
- High Street/Station Road junction traffic signals;
- North Hyde Gardens/North Hyde Road/Watersplash Lane traffic signals; and
- North Hyde Road / Hayes Bypass / Hayes Road signalised roundabout.

10.1.9 For the North Hyde Road/Station Road signals junction, to mitigate for the effects of development traffic at this junction we proposed to increase the existing cycle time to 96 seconds which is compatible with UTC/Scoot control. It should be noted that the ASDA development has also proposed this cycle time, which had no objections against it and it would be equally appropriate solution for the proposed development on HPH.

10.1.10 It has been demonstrated that by increasing the cycle time of the junction to 96 seconds with the full development in place would result in the junction performing better than under the 2014 and 2024 Baseline traffic flows. It is therefore considered that the mitigation proposed has fully mitigate the full development traffic impact at this location.

10.2 Conclusions

- 10.2.1 The development site is well located in terms of access to sustainable modes of transports, with transport planning policy at local, regional and national level supports sustainable developments.
- 10.2.2 The full development traffic impact can be fully mitigated by the proposed mitigation at the North Hyde Road/Station Road junction.
- 10.2.3 SKM Colin Buchanan are therefore of the view that the impact of the full development proposals can be mitigated acceptably and therefore there are no transport reasons to preclude development of the site as proposed.

Signature

Position

Company SKM Colin Buchanan

Date August 2012