National Grid

WEST SOUTHALL

Addendum Transport Assessment

May 2009

Contents

Appendices

1 INTRODUCTION

1.1 National Grid submitted a planning application in October 2008 for the comprehensive redevelopment of the former gasworks site (the "Site") in Southall. The planning application was accompanied by a Transport Assessment covering all aspects including several models of junctions in and around Southall.

1.2 Regular meetings have been held with Ealing Council, Transport for London and the Highways Agency since the submission to discuss the planning application, and the various junction assessment models have been audited by AECOM on behalf of Transport for London and the Highways Agency, and by JCT on behalf of Ealing Council. In addition, Stage 1 Road Safety Audits have been conducted by White Young Green (Leicester).

1.3 This document summarises the results of the discussions and the various audit processes which are presented in this addendum. The remainder of the document is as follows;

- Section 2 outlines the junction audit process
- Section 3: summarises, clarifies and extrapolates the design approach taken in various application drawings that have occurred as a result of the modelling and discussions.
- Section 4 summarises the revised junction capacity assessments
- Section 5 covers the South Road Bus Priority Scheme
- Section 6 reviews the phasing and construction
- Section 7 summarises and concludes

2 JUNCTION AUDIT PROCESS

Junction Capacity Audit

2.1 The capacity assessments have been audited by both AECOM and JCT with the aim of ensuring that the models are sufficiently accurate to interpret the results. The audits resulted in some modifications to the structure of the models along with minor changes to junction layouts, such as the position of stoplines, etc.

2.2 AECOM audited all of the submitted TRANSYT models on behalf of Transport for London, who are responsible for all signalised junctions in Greater London, and on behalf of the Highways Agency (HA) who are responsible for parts of the M4 J3. The audit which was conducted using the DTO Model Guidelines resulted in some modifications being made to the models.

2.3 Ealing Council commissioned JCT to undertake an independent audit of the models which resulted in the refinement of several of the models used initially. The JCT audit reviewed the methodology and considered one or two Assessment Scenarios, concentrating on the Observed Flows (Existing layout) and the 2025 Design Flows (Proposed layout).

Road Safety Audits

2.4 The junction layouts where improvements have been proposed as part of the planning application have been subject to Stage 1 Road Safety Audits conducted by White Young Green (Leicester). The Safety Audits revealed some minor issues some of which have been addressed in the latest drawings and the remainder will be picked up at the S278 Detailed Design Stage. The audits did not reveal any issues that would alter the principle of the designs.

3 JUNCTION LAYOUT PLANS

3.1 This section summarises the variations to some of the junction designs to reflect the regular meetings, modelling audits and Road Safety Audits. Table 3.1 lists the sites along with the submitted and current drawing numbers. Copies of all of the current drawings are included in **Appendix 3A**.

Table 3.1: Summary of Drawings

Title / Location / Scheme		Drawing Submitted with Planning Application	Current Drawing
South Road / Eastern Access	Final Scheme	52212/B/35	52212/B/35 Rev A
	Interim Scheme*	-	52212/B/53
South Road / Merrick Road	Final Scheme	52212/B/36	52212/B/36 Rev A
	Interim Scheme*	-	52212/B/54
Beaconsfield Road Site Access	Western Access	52212/A/49	52212/A/49
	Middle Access	52212/A/50	52212/A/50
	Eastern Access	52212/A/51	52212/A/51
Pump Lane / Western Access	Final Scheme	52212/B/33	52212/B/33
	Construction Access	-	52212/B/51
A312 / Pump Lane		52212/B/34	52212/B/34
Bulls Bridge Junction		52212/B/32	52212/B/48
M4 J3		52212/B/31	52212/B/31 Rev A
South Road Bus Priority Scheme (Northbound Lane)		-	52212/B/49
South Road Bridge Widening		-	52212/B/50

*Interim Schemes in advance of South Road Bridge Widening Scheme

3.2 The modifications, where appropriate, have been subject to revised modelling which is summarised in Section 4. All of the junction layouts illustrated on the current drawings have been reviewed by the highway authorities during the consultation process and are deemed acceptable and appropriate mitigation given the scale and location of the development.

Eastern Access / South Road

3.3 The proposals are to construct the Eastern Access in stages. The first phase involves the widening of South Road to the north of the railway line, the removal of the existing pedestrian crossing outside Southall Station and the construction of the new signalised junction in to the Site. The second stage involves the widening of South Road bridge over the railway line. The timing of this will depend on the programme for the implementation of the Crossrail proposals at Southall Station as it is intended to do the bridge widening works in tandem with the Crossrail works.

3.4 The layout of the final scheme now includes the signalisation of the bus lane junction with The Straight along with extending the length of the pedestrian island across the southern approach to the Site Access and the relocation of the zebra crossing on the Site Access as shown on Drawing 52212/B/35 Rev A.

3.5 Drawing 52212/B/53 illustrates the interim layout of the junction which is envisaged as the first phase of the Eastern Access junction works.

South Road / Merrick Road

3.6 The proposals include the signalisation of the South Road / Merrick Road junction as set out in the submitted Transport Assessment. The layout of the final scheme now includes the introduction of a stop line at the pedestrian crossing on the northbound exit on South Road along and the removal of the give way line for vehicles turning left from South Road in to Merrick Road as shown on Drawing 52212/B/36 Rev A.

3.7 Drawing 52212/B/54 illustrates the interim layout of the junction which will be constructed immediately following the completion and opening of the first phase of the South Road / Eastern Access junction. The final layout will depend on the timing for the Southall Station Crossrail improvements.

Beaconsfield Road Site Accesses

3.8 There have been no modifications to the layout drawings as included in the submitted planning application.

Pump Lane / Western Access

3.9 There have been no modifications to the layout drawings as included in the submitted planning application.

A312 Hayes By-pass / Pump Lane

3.10 There have been no modifications to the layout drawings as included in the submitted planning application.

Bulls Bridge Junction (A312 / North Hyde Road)

3.11 The plans submitted with the planning application proposed creating a "Hamburger style" junction with north and south bound ahead traffic passing through the centre of the junction.

3.12 The junction has been elongated by the addition of a circulatory carriageway as shown on Drawing 52212/B/48 in order to increase capacity.

M4 J3

3.13 The modifications to the layout include increasing the length of the merge on the northbound exit from the junction.

South Road Bus Priority Scheme

3.14 The South Road Bus Priority Scheme has evolved following discussions with Ealing Council and Transport for London and is discussed further in Section 5. The proposals are to create a northbound bus lane where possible within the public highway along South Road between Park Avenue and the A4020 Broadway as shown on Drawing 52212/B/49.

4 CAPACITY ASSESSMENTS

4.1 The models have been audited by both AECOM and JCT, with AECOM having reviewed all of the models over the past 6 months since the submission of the planning application and JCT auditing selected models more recently.

Bulls Bridge Junction (A312 / North Hyde / Hayes)

4.2 The proposals included in the planning application envisaged creating a "Hamburger" style junction with north – south ahead traffic passing through the junction, along with widening on the northern and southern approaches as shown on Drawing 52212/B/32.

4.3 The submitted Transport Assessment included assessments of the existing and proposed layouts, considering scenarios with and without growth through to 2025 and concluded that the proposed junction achieved nil detriment, i.e. that the proposed junction with development flows operated better than the existing junction. The results of the various TRANSYT assessments submitted with the planning application are summarised in Tables 11.12 through 11.23 in the Transport Assessment dated October 2008.

4.4 The AECOM audit of the submitted models and layouts suggested that the design of the junction could be improved partly to avoid land ownership constraints.

4.5 The layout has now been revised as illustrated on Drawing 52212/B/48 to create additional capacity through elongating the junction and increasing the number of lanes within the junction. The observed and 2025 Base + Development Scenarios were audited by AECOM and JCT and the results of the models are summarised in Tables 4.1 through 4.3 overleaf. The interim year models were not assessed as it is accepted that the 2025 year flows represent a worst case flow scenario.

4.6 The results of the modelling as audited by AECOM and JCT indicate that the proposed layout achieves nil-detriment in 2025, albeit that queues are still anticipated to form on the approaches. Copies of the full output are included at **Appendix 4A**.

Table 4.1: Observed Scenario

	AM Peak			PM Peak			Saturday Peak		
	Flow	DOS	Q	Flow	DOS	Q	Flow	DOS	Q
A312 North	2,533	108%	136	2,563	111%	139	2,270	107%	95
Hayes Road	1,319	76%	12	1,602	78%	19	1,602	80%	15
A312 South	2,265	102%	66	2,733	109%	130	2,014	101%	53
North Hyde Road	881	108%	55	1,027	102%	37	954	100%	32

Table 4.2: Year 15 (2025) Base Scenario (No Improvement)

	AM Peak			PM Peak			Saturday Peak		
	Flow	DOS	Q	Flow	DOS	Q	Flow	DOS	Q
A312 North	3,093	276%	916	3,094	140%	363	2,761	487%	1073
Hayes Road	1,669	90%	24	2,050	90%	30	1,852	87%	27
A312 South	2,789	119%	279	3,311	167%	732	2,494	121%	240
North Hyde Road	1,113	127%	141	1,375	184%	349	1,193	160%	252

Table 4.3: Year 15 (2025) Base + Development (Proposed Layout)

	AM Peak			PM Peak			Saturday Peak		
	Flow	DOS	Q	Flow	DOS	Q	Flow	DOS	Q
A312 North	3,535	196%	823	3,327	129%	325	1,927	193%	659
Hayes Road	1,657	82%	24	2,050	97%	34	1,990	80%	16
A312 South	2,958	116%	262	3,655	173%	764	2,711	115%	225
North Hyde Road	1148	120%	120	1,422	176%	339	1206	151%	229

M4 J3

4.7 AECOM reviewed all of the models on behalf of TfL and the HA, whilst JCT reviewed the existing layout and the 2025 Base + Development Scenarios on behalf of Ealing Council as an independent audit. The models were adapted where appropriate and the results of the revised models are summarised in Tables 4.4 to 4.11 which update those included in the submitted Transport Assessment (Tables 11.40 to 11.48). Capacity assessments for the Base plus Development Scenarios without improvements have not been summarised in this document. Copies of the full output are included at **Appendix 4B**.

Table 4.4: Observed Scenario

	AM Peak			PM Peak			Saturday Peak		
	Flow	**DOS**	**Q**	**Flow**	**DOS**	**Q**	**Flow**	**DOS**	**Q**
A312 North	2,078	99%	69	2,152	103%	83	1,954	83%	41
M4 East	618	91%	22	577	92%	20	541	71%	14
A312 South	2,033	96%	39	2,025	93%	55	1,759	81%	37
M4 West	2,368	94%	69	1,556	97%	76	1,818	92%	46

Table 4.5: 2010 Base Scenario (No Improvement)

	AM Peak			PM Peak			Saturday Peak		
	Flow	**DOS**	**Q**	**Flow**	**DOS**	**Q**	**Flow**	**DOS**	**Q**
A312 North	2,181	108%	110	2,304	108%	125	2,017	97%	60
M4 East	366	120%	67	613	128%	95	559	96%	25
A312 South	2,150	94%	34	2,073	94%	56	1,816	89%	45
M4 West	2,456	98%	83	2,347	96%	74	1,867	101%	58

Table 4.6: 2015 Base Scenario (No Improvement)

	AM Peak			PM Peak			Saturday Peak		
	Flow	**DOS**	**Q**	**Flow**	**DOS**	**Q**	**Flow**	**DOS**	**Q**
A312 North	2,267	136%	324	2,394	131%	342	2,099	111%	138
M4 East	703	137%	109	630	185%	167	581	108%	36
A312 South	2,221	117%	170	2,136	108%	110	1,890	110%	106
M4 West	2,554	103%	101	2,424	101%	87	1,943	117%	125

Table 4.7: 2015 Base + Development (With Improvement)

	AM Peak			PM Peak			Saturday Peak		
	Flow	**DOS**	**Q**	**Flow**	**DOS**	**Q**	**Flow**	**DOS**	**Q**
A312 North	2,414	89%	45	2,478	90%	40	2,192	86%	43
M4 East	715	124%	87	668	116%	56	624	89%	18
A312 South	2,242	99%	56	2,191	105%	79	1,942	95%	48
M4 West	2,577	102%	75	2,471	93%	53	1,996	96%	46

Table 4.8: 2020 Base Scenario (No Improvement)

	AM Peak			PM Peak			Saturday Peak		
	Flow	**DOS**	**Q**	**Flow**	**DOS**	**Q**	**Flow**	**DOS**	**Q**
A312 North	2,323	168%	457	2,406	153%	505	2,184	105%	138
M4 East	697	176%	176	655	201%	179	605	145%	58
A312 South	2,282	116%	164	2,225	111%	120	1,976	102%	80
M4 West	2,554	105%	131	2,522	110%	146	2,021	106%	101

Table 4.9: 2020 Base + Development (With Improvement)

	AM Peak			PM Peak			Saturday Peak		
	Flow	**DOS**	**Q**	**Flow**	**DOS**	**Q**	**Flow**	**DOS**	**Q**
A312 North	2,691	93%	51	2,690	86%	48	2,376	79%	46
M4 East	760	105%	41	744	154%	123	673	105%	33
A312 South	2,367	97%	57	2,367	100%	61	2,059	97%	53
M4 West	2,703	103%	83	2,629	103%	67	2,121	96%	49

Table 4.10: 2025 Base Scenario (No Improvement)

	AM Peak			PM Peak			Saturday Peak		
	Flow	**DOS**	**Q**	**Flow**	**DOS**	**Q**	**Flow**	**DOS**	**Q**
A312 North	2,449	227%	797	2,587	148%	447	2,417	117%	223
M4 East	746	128%	95	689	95%	28	728	131%	88
A312 South	2,403	101%	75	2,322	145%	379	2,092	140%	261
M4 West	2,762	104%	130	2,653	103%	111	2,734	117%	122

Table 4.11: 2025 Base + Development (With Improvement)

	AM Peak			PM Peak			Saturday Peak		
	Flow	**DOS**	**Q**	**Flow**	**DOS**	**Q**	**Flow**	**DOS**	**Q**
A312 North	2,876	92%	62	2,804	93%	52	2,456	89%	48
M4 East	786	112%	46	766	118%	55	710	94%	22
A312 South	2,466	102%	72	2,481	113%	138	2,151	101%	67
M4 West	2,922	103%	100	2,739	105%	93	2,472	103%	70

4.8 The results of the revised models illustrate that the existing junction currently operates at capacity with long queues. Congestion levels and queue lengths will increase with time should growth materialise and if no junction improvements are implemented. However, the proposed junction with development flows is anticipated to operate better than the existing junction with no development flows, i.e. that the proposals achieve nil-detriment.

A312 / Pump Lane

4.9 AECOM reviewed all of the models on behalf of TfL and JCT reviewed the structures of the existing layout and the 2025 Base + Development Scenarios on behalf of Ealing Council resulting in changes being made to the input parameters.

4.10 The results of the revised models which are summarised below in Tables 4.12 through to 4.15 inclusive update the results in the submitted Transport Assessment (Tables 11.24 through 11.29) and reflect comments where appropriate from AECOM and JCT. The results indicate that the proposed junction will operate satisfactorily during peak period. Copies of the full output are included at **Appendix 4C**.

4.11 Currently, at some times queues associated with the Bulls Bridge signalised junction can extend past the Pump Lane junction. The proposed capacity enhancements at the Bulls Bridge and M4 J3 junctions are intended to assist in reducing queues. In addition, the new signalised junction at Pump Lane will manage traffic and assist in regulating speeds rather than delay traffic.

Table 4.12: Year 5 (2015) Base + Development

	AM Peak			PM Peak			Saturday Peak		
	Flow	**DOS**	**Q**	**Flow**	**DOS**	**Q**	**Flow**	**DOS**	**Q**
A312 North	2,681	62%	27	2,786	63%	27	2,920	65%	29
Pump Lane	627	17%	12	864	82%	18	504	64%	9
A312 South	2,238	59%	18	3,183	83%	35	2,712	71%	25

Table 4.13: Year 10 (2020) Base + Development

	AM Peak			PM Peak			Saturday Peak		
	Flow	**DOS**	**Q**	**Flow**	**DOS**	**Q**	**Flow**	**DOS**	**Q**
A312 North	2,827	76%	36	2,975	67%	30	3,102	68%	31
Pump Lane	1,105	86%	22	1,024	81%	21	670	79%	13
A312 South	2,328	62%	20	3,310	88%	40	2,822	74%	27

Table 4.14: Year 15 (2025) Base + Development

	AM Peak			PM Peak			Saturday Peak		
	Flow	**DOS**	**Q**	**Flow**	**DOS**	**Q**	**Flow**	**DOS**	**Q**
A312 North	2,895	86%	50	3,074	69%	32	3,214	72%	34
Pump Lane	1,252	90%	20	1,056	80%	22	962	78%	19
A312 South	2,421	66%	24	3,441	92%	46	2,936	78%	31

Table 4.15: Year 15 Observed + Development (i.e. No Growth)

	AM Peak			PM Peak			Saturday Peak		
	Flow	**DOS**	**Q**	**Flow**	**DOS**	**Q**	**Flow**	**DOS**	**Q**
A312 North	2,385	70%	34	2,583	57%	23	2,672	58%	23
Pump Lane	1,159	83%	22	944	79%	18	859	75%	17
A312 South	2,427	65%	22	2,005	54%	16	2,446	64%	21

Pump Lane / Western Access

4.12 AECOM reviewed all of the models on behalf of TfL whilst JCT reviewed the structure of the 2025 Base + Development Scenarios on behalf of Ealing Council resulting in some modifications being made to the submitted models. The results of the revised assessments which are summarised in Tables 4.16 through to 4.18 update those in the submitted Transport Assessment (Tables 11.28 through 11.30). Copies of the full output are included at **Appendix 4C**.

4.13 The results of the revised assessments indicate that the junction will operate within capacity during the peak periods with some queues forming on the eastern approach from the Site. However, the queues will not impact the operation of the existing highway and are anticipated to dissipate each cycle.

Table 4.16: Year 5 (2015) Base + Development

	AM Peak			PM Peak			Saturday Peak		
	Flow	**DOS**	**Q**	**Flow**	**DOS**	**Q**	**Flow**	**DOS**	**Q**
Pump Lane North	211	30%	3	304	40%	4	350	41%	5
Site Access Right	230	34%	3	219	38%	3	122	28%	2
Site Access Ahead	91	14%	1	91	16%	1	138	30%	2
Pump Lane West	511	28%	5	823	46%	7	515	27%	4

Table 4.17: Year 10 (2020) Base + Development

	AM Peak			PM Peak			Saturday Peak		
	Flow	**DOS**	**Q**	**Flow**	**DOS**	**Q**	**Flow**	**DOS**	**Q**
Pump Lane North	266	45%	4	405	51%	6	428	52%	6
Site Access Right	499	61%	8	353	53%	6	273	46%	6
Site Access Ahead	123	10%	1	123	18%	2	182	31%	3
Pump Lane West	619	30%	6	1,056	48%	10	691	29%	7

Table 4.18: Year 15 (2025) Base + Development

	AM Peak			PM Peak			Saturday Peak		
	Flow	**DOS**	**Q**	**Flow**	**DOS**	**Q**	**Flow**	**DOS**	**Q**
Pump Lane North	232	53%	4	400	53%	6	437	52%	6
Site Access Right	650	68%	11	357	57%	6	284	51%	5
Site Access Ahead	96	11%	1	116	17%	2	143	26%	2
Pump Lane West	809	41%	7	1,120	50%	12	1,001	48%	10

Ossie Garvin Junction (A312 / A4020)

4.14 AECOM reviewed all of the models on behalf of TfL and JCT reviewed the existing layout and the 2025 Base + Development Scenarios on behalf of Ealing Council as an independent audit resulting in some minor changes being made to the submitted assessments. The results of the revised models are summarised in Tables 4.19 through 4.26 inclusive and update those included in the submitted Transport Assessment (Tables 11.59 through 11.66). The results indicate that the junction will continue to operate satisfactorily following the redevelopment of the gasworks site. Copies of the full output are included at **Appendix 4D**.

Table 4.19: Observed Scenario

	AM Peak			PM Peak			Saturday Peak		
	Flow	**DOS**	**Q**	**Flow**	**DOS**	**Q**	**Flow**	**DOS**	**Q**
A312 North Slip	730	50%	9	527	38%	8	949	72%	15
A4020 East App.	1,165	83%	22	1,282	102%	34	1,264	106%	42
A312 South Slip	603	57%	11	1,007	100%	26	833	79%	16
A4020 West App.	1,070	70%	18	1,210	75%	20	1,279	92%	25

Table 4.20: Year 5 (2010) Base Scenario

	AM Peak			PM Peak			Saturday Peak		
	Flow	**DOS**	**Q**	**Flow**	**DOS**	**Q**	**Flow**	**DOS**	**Q**
A312 North Slip	764	46%	9	553	60%	9	979	82%	17
A4020 East App.	1,221	40%	12	1,345	49%	14	1,305	58%	13
A312 South Slip	629	48%	10	1,052	69%	16	860	63%	14
A4020 West App.	1,122	44%	12	1,269	47%	15	1,321	55%	15

Table 4.21: Year 5 (2015) Base Scenario

	AM Peak			PM Peak			Saturday Peak		
	Flow	**DOS**	**Q**	**Flow**	**DOS**	**Q**	**Flow**	**DOS**	**Q**
A312 North Slip	793	48%	9	575	59%	9	1,020	80%	17
A4020 East App.	1,271	43%	13	1,400	61%	18	1,358	62%	17
A312 South Slip	655	52%	10	1,095	68%	16	895	64%	14
A4020 West App.	1,169	46%	13	1,321	43%	15	1,375	59%	17

Table 4.22: Year 5 (2015) Base + Development Scenario

	AM Peak			PM Peak			Saturday Peak		
	Flow	**DOS**	**Q**	**Flow**	**DOS**	**Q**	**Flow**	**DOS**	**Q**
A312 North Slip	793	65%	12	575	62%	9	1,020	80%	17
A4020 East App.	1,271	42%	13	1,400	61%	18	1,358	63%	14
A312 South Slip	674	52%	10	1,114	54%	14	917	61%	15
A4020 West App.	1,179	44%	12	1,337	50%	`5	1,404	59%	17

Table 4.23: Year 10 (2020) Base Scenario

	AM Peak			PM Peak			Saturday Peak		
	Flow	**DOS**	**Q**	**Flow**	**DOS**	**Q**	**Flow**	**DOS**	**Q**
A312 North Slip	789	63%	12	595	64%	10	1,061	83%	18
A4020 East App.	1,324	50%	16	1,456	59%	17	1,412	68%	19
A312 South Slip	682	50%	10	1,139	67%	16	931	68%	15
A4020 West App.	1,215	47%	13	1,375	51%	15	1,430	64%	17

Table 4.24: Year 10 (2020) Base + Development Scenario

	AM Peak			PM Peak			Saturday Peak		
	Flow	**DOS**	**Q**	**Flow**	**DOS**	**Q**	**Flow**	**DOS**	**Q**
A312 North Slip	789	63%	12	595	64%	10	1,061	83%	18
A4020 East App.	1,324	45%	14	1,456	63%	19	1,442	62%	14
A312 South Slip	710	56%	12	1,170	55%	15	971	65%	15
A4020 West App.	1,233	46%	14	1,403	55%	17	1,486	67%	18

Table 4.25: Year 15 (2025) Base Scenario

	AM Peak			PM Peak			Saturday Peak		
	Flow	**DOS**	**Q**	**Flow**	**DOS**	**Q**	**Flow**	**DOS**	**Q**
A312 North Slip	821	68%	12	620	67%	12	1,104	86%	20
A4020 East App.	1,377	48%	15	1,515	61%	19	1,471	64%	18
A312 South Slip	709	61%	12	1,186	52%	17	969	71%	16
A4020 West App.	1,266	67%	14	1,430	58%	18	1,488	63%	19

Table 4.26: Year 15 (2025) Base + Development Scenario									
	AM Peak			**PM Peak**			**Saturday Peak**		
	Flow	**DOS**	**Q**	**Flow**	**DOS**	**Q**	**Flow**	**DOS**	**Q**
A312 North Slip	821	63%	12	620	61%	10	1,104	86%	20
A4020 East App.	1,377	51%	17	1,515	54%	16	1,471	65%	18
A312 South Slip	756	56%	13	1,220	66%	17	1,019	69%	16
A4020 West App.	1,289	51%	15	1,464	51%	16	1,559	69%	20

Pump Lane / Bilton Way

4.15 The assessments have been reviewed by JCT on behalf of Ealing Council and the model adapted to reflect JCT's observations. The results of the revised models which are summarised in Tables 4.27 to 4.34 update those in the Transport Assessment (Tables 11.49 to 11.55) indicate that the existing junction operates within capacity and is anticipated to operate at capacity in 2025 with full development if demand flows and growth materialise with relatively long queues forming on the Bilton Way northern approach. Copies of the full output are included at **Appendix 4E**.

4.16 In this regard, an additional scenario has been run without growth which illustrates that the junction will operate within capacity when development flows are added to observed flows. These results are considered to represent a more realistic scenario insofar that the redevelopment of the Site caters for the majority of the development in the region and there are existing constraints elsewhere on the highway network that restrict peak hour growth.

Table 4.27: Observed Scenario

	AM Peak			PM Peak			Saturday Peak		
	Flow	**RFC**	**Q**	**Flow**	**RFC**	**Q**	**Flow**	**RFC**	**Q**
Pump Lane (W)	493	0.41	1	616	0.51	1	562	0.47	1
Bilton Way	308	0.34	1	386	0.42	1	312	0.34	1
Pump Lane (E)	136	0.12	1	118	0.11	1	249	0.23	1

Table 4.28: Year 5 (2015) Base Scenario

	AM Peak			PM Peak			Saturday Peak		
	Flow	**RFC**	**Q**	**Flow**	**RFC**	**Q**	**Flow**	**RFC**	**Q**
Pump Lane (W)	542	0.45	1	678	0.56	1	618	0.51	1
Bilton Way	339	0.38	1	425	0.48	1	344	0.38	1
Pump Lane (E)	149	0.14	1	130	0.13	1	274	0.25	1

Table 4.29: Year 5 (2015) Development Scenario

	AM Peak			PM Peak			Saturday Peak		
	Flow	**RFC**	**Q**	**Flow**	**RFC**	**Q**	**Flow**	**RFC**	**Q**
Pump Lane (W)	565	0.47	1	728	0.60	2	684	0.57	1
Bilton Way	386	0.48	1	517	0.71	2	396	0.54	1
Pump Lane (E)	170	0.16	1	191	0.18	1	339	0.32	1

Table 4.30: Year 10 (2020) Base Scenario

	AM Peak			PM Peak			Saturday Peak		
	Flow	**RFC**	**Q**	**Flow**	**RFC**	**Q**	**Flow**	**RFC**	**Q**
Pump Lane (W)	565	0.47	1	706	0.58	1	643	0.53	1
Bilton Way	353	0.40	1	442	0.50	1	357	0.40	1
Pump Lane (E)	156	0.14	1	135	0.13	1	285	0.27	1

Table 4.31: Year 10 (2020) Development Scenario

	AM Peak			PM Peak			Saturday Peak		
	Flow	**RFC**	**Q**	**Flow**	**RFC**	**Q**	**Flow**	**RFC**	**Q**
Pump Lane (W)	591	0.49	1	768	0.64	2	729	0.61	2
Bilton Way	499	0.64	2	727	1.03	26	548	0.78	3
Pump Lane (E)	198	0.18	1	204	0.20	1	366	0.34	1

Table 4.32: Year 15 (2025) Base Scenario

	AM Peak			PM Peak			Saturday Peak		
	Flow	**RFC**	**Q**	**Flow**	**RFC**	**Q**	**Flow**	**RFC**	**Q**
Pump Lane (W)	588	0.49	1	735	0.61	2	669	0.56	1
Bilton Way	367	0.42	1	460	0.52	1	372	0.42	1
Pump Lane (E)	163	0.15	1	140	0.14	1	297	0.28	1

Table 4.33: Year 15 (2025) Development Scenario

	AM Peak			PM Peak			Saturday Peak		
	Flow	**RFC**	**Q**	**Flow**	**RFC**	**Q**	**Flow**	**RFC**	**Q**
Pump Lane (W)	618	0.51	1	799	0.66	2	772	0.64	2
Bilton Way	542	0.70	2	818	1.19	78	592	0.87	6
Pump Lane (E)	220	0.20	1	211	0.20	1	395	0.37	1

Table 4.34: Observed + Development Scenario

	AM Peak			PM Peak			Saturday Peak		
	Flow	**RFC**	**Q**	**Flow**	**RFC**	**Q**	**Flow**	**RFC**	**Q**
Pump Lane (W)	524	0.43	1	684	0.57	1	664	0.55	1
Bilton Way	483	0.51	1	743	0.99	19	532	0.72	3
Pump Lane (E)	193	0.18	1	191	0.18	1	347	0.32	1

Eastern Access / South Road

4.17 AECOM reviewed all of the models on behalf of TfL whilst JCT reviewed the existing layout and the 2025 Base + Development Scenarios on behalf of Ealing Council. The audits resulted in changes being made to the input parameters and the results of the Observed, 2010 and 2025 Base Scenarios plus 2025 Development Scenarios are summarised below in Tables 4.35 through 4.38 and update those in Tables 11.40, 11.41, 11.44 and 11.47 in the submitted Transport Assessment. Copies of the full output are included at **Appendix 4F**.

Table 4.35: Observed Scenario

South Rd / Park Ave	**AM Peak**			**PM Peak**			**Saturday Peak**		
	Flow	**DOS**	**Q**	**Flow**	**DOS**	**Q**	**Flow**	**DOS**	**Q**
South Road (N)	479	82%	14	450	76%	12	483	82%	15
Park Avenue	401	88%	14	308	92%	13	328	80%	10
South Road (S)	903	87%	24	1,066	92%	31	910	82%	23
Beaconsfield Road	293	68%	9	224	99%	9	252	85%	9
Pedestrian Crossing	**AM Peak**			**PM Peak**			**Saturday Peak**		
	Flow	**DOS**	**Q**	**Flow**	**DOS**	**Q**	**Flow**	**DOS**	**Q**
South Road (N)	963	80%	24	807	67%	20	805	69%	21
South Road (S)	903	69%	8	1,066	87%	14	910	71%	9
South Rd / Merrick	**AM Peak**			**PM Peak**			**Saturday Peak**		
	Flow	**RFC**	**Q**	**Flow**	**RFC**	**Q**	**Flow**	**RFC**	**Q**
South Road (N)	905	78%	17	741	66%	17	739	69%	20
Merrick Road	558	36%	0	546	35%	0	464	29%	0
The Green	448	40%	0	556	53%	1	513	47%	0

Table 4.36: 2010 Base Scenario (Existing Layout)

South Rd / Park	**AM Peak**			**PM Peak**			**Saturday Peak**		
	Flow	**DOS**	**Q**	**Flow**	**DOS**	**Q**	**Flow**	**DOS**	**Q**
South Road (N)	517	85%	16	450	92%	20	483	87%	16
Park Avenue	431	101%	22	338	123%	49	339	86%	12
South Road (S)	944	94%	34	1,115	100%	49	937	94%	33
Beaconsfield Road	307	89%	11	234	105%	28	260	97%	12
Pedestrian Crossing	**AM Peak**			**PM Peak**			**Saturday Peak**		
	Flow	**DOS**	**Q**	**Flow**	**DOS**	**Q**	**Flow**	**DOS**	**Q**
South Road (N)	1,007	83%	15	843	74%	15	829	71%	11
South Road (S)	944	73%	9	1,115	91%	17	937	74%	9
South Rd / Merrick	**AM Peak**			**PM Peak**			**Saturday Peak**		
	Flow	**DOS**	**Q**	**Flow**	**DOS**	**Q**	**Flow**	**DOS**	**Q**
South Road (N)	949	82%	18	777	71%	16	763	68%	14
Merrick Road	577	36%	0	596	35%	0	479	28%	0
The Green	479	43%	0	562	51%	1	513	44%	0

Table 4.37: 2025 Base Scenario (Existing Layout)

South Rd / Park	**AM Peak**			**PM Peak**			**Saturday Peak**		
	Flow	**DOS**	**Q**	**Flow**	**DOS**	**Q**	**Flow**	**DOS**	**Q**
South Road (N)	574	89%	18	537	94%	22	543	95%	21
Park Avenue	484	132%	74	381	100%	114	382	108%	31
South Road (S)	1,058	98%	43	1,238	104%	53	1,041	103%	45
Beaconsfield Road	346	102%	15	264	158%	44	293	135%	30
Pedestrian Crossing	**AM Peak**			**PM Peak**			**Saturday Peak**		
	Flow	**DOS**	**Q**	**Flow**	**DOS**	**Q**	**Flow**	**DOS**	**Q**
South Road (N)	1,128	84%	17	1037	72%	17	917	74%	14
South Road (S)	1,058	82%	12	1,238	102%	44	1,041	89%	12
South Rd / Merrick	**AM Peak**			**PM Peak**			**Saturday Peak**		
	Flow	**DOS**	**Q**	**Flow**	**DOS**	**Q**	**Flow**	**DOS**	**Q**
South Road (N)	1,070	82%	18	1,037	69%	16	896	71%	15
Merrick Road	650	38%	0	671	39%	0	540	32%	0
The Green	541	76%	0	696	58%	1	627	49%	0

Table 4.38: Year 15 (2025) Base + Development (Proposed Layout)

South Rd / Park Ave	**AM Peak**			**PM Peak**			**Saturday Peak**		
	Flow	**DOS**	**Q**	**Flow**	**DOS**	**Q**	**Flow**	**DOS**	**Q**
South Road (N)	640	97%	24	711	103%	36	711	116%	72
Park Avenue	506	175%	127	455	120%	110	451	127%	63
South Road (S)	1,250	75%	23	1,525	89%	25	1,318	88%	24
Beaconsfield Road	346	94%	14	264	121%	23	293	121%	21
South Rd / Site Acc.	**AM Peak**			**PM Peak**			**Saturday Peak**		
	Flow	**DOS**	**Q**	**Flow**	**DOS**	**Q**	**Flow**	**DOS**	**Q**
South Rd Ahead (N)	1,128	66%	11	934	59%	11	898	54%	9
South Rd Right (N)	101	17%	0	248	58%	7	256	59%	6
South Rd (S)	1,151	72%	13	1,513	75%	20	1,311	70%	17
Site Access	341	68%	9	452	112%	28	482	118%	35
South Rd / Merrick	**AM Peak**			**PM Peak**			**Saturday Peak**		
	Flow	**DOS**	**Q**	**Flow**	**DOS**	**Q**	**Flow**	**DOS**	**Q**
South Road (N)	1,264	40%	4	1,151	38%	2	1,133	39%	3
Merrick Road	707	207%	197	783	262%	251	662	214%	180
The Green	645	39%	5	859	53%	9	811	49%	7

4.18 The results indicate that the network currently operates at capacity with queues forming on several approaches. Queue lengths and levels of congestion are anticipated to increase if growth and demand flows materialise. However, as indicated in the Transport Assessment, it is anticipated that flow increases will not materialise due to constraints elsewhere on the highway network with development traffic displacing through traffic.

Beaconsfield Road Site Accesses

4.19 JCT reviewed the structure of the 2025 Base + Development Scenario models on behalf of Ealing Council and the models were adapted to reflect their observations. The results of the revised models which are summarised in Tables 4.39 through to 4.41 update those in Tables 11.49 through 11.53 of the submitted Transport Assessment. The results indicate that the junctions will operate within capacity. Copies of the full output are included at **Appendix 4G**.

Table 4.39 Year 15 (2025) Base + Development (Western Access)

	AM Peak			PM Peak			Saturday Peak		
	Flow	**DOS**	**Q**	**Flow**	**DOS**	**Q**	**Flow**	**DOS**	**Q**
Site Access	-	-	-	-	-	-	-	-	-
Right turn into site	56	0.14	1	94	0.24	1	148	0.35	1

Table 4.40: Year 15 (2025) Base + Development (Middle Access)

	AM Peak			PM Peak			Saturday Peak		
	Flow	**DOS**	**Q**	**Flow**	**DOS**	**Q**	**Flow**	**DOS**	**Q**
Trinity Road	50	0.09	1	50	0.09	1	93	0.15	1
Site Access	71	0.15	1	122	0.29	1	143	0.35	1

Table 4.41: Year 15 (2025) Base + Development (Eastern Access)

	AM Peak			PM Peak			Saturday Peak		
	Flow	**DOS**	**Q**	**Flow**	**DOS**	**Q**	**Flow**	**DOS**	**Q**
Site Access	-	-	-	-	-	-	-	-	-
Right turn into site	56	0.14	1	94	0.24	1	148	0.35	1

A4020 Uxbridge Road / South Road

4.20 The results of the audited models are summarised in Tables 4.42 through 4.49 inclusive. AECOM reviewed all of the models on behalf of TfL and JCT reviewed the existing layout and the 2025 Base + Development Scenarios on behalf of Ealing Council as an independent audit. Copies of the full output are included at **Appendix 4H**.

4.21 The results of the assessments indicate that the junction currently operates at capacity during the peak periods with long queues forming on the approaches. Congestion and queue lengths are anticipated to increase should growth and demand flows materialise. However, this is unlikely to be the case with development traffic displacing non-essential through traffic and people changing their travel habits to minimise inconvenience.

Table 4.42: Observed Scenario

	AM Peak			PM Peak			Saturday Peak		
	Flow	**DOS**	**Q**	**Flow**	**DOS**	**Q**	**Flow**	**DOS**	**Q**
Lady Margaret Rd	397	89%	14	401	90%	14	488	102%	27
A4020 East	554	103%	31	474	90%	16	520	102%	28
South Road	498	100%	24	469	93%	17	505	93%	19
A4020 West	543	94%	22	662	93%	20	556	77%	15

Table 4.43: 2010 Base Scenario

	AM Peak			PM Peak			Saturday Peak		
	Flow	**DOS**	**Q**	**Flow**	**DOS**	**Q**	**Flow**	**DOS**	**Q**
Lady Margaret Rd	422	93%	16	418	94%	16	502	113%	47
A4020 East	582	108%	42	498	95%	19	537	102%	29
South Road	532	104%	31	488	96%	20	519	103%	29
A4020 West	692	98%	40	695	113%	44	574	135%	36

Table 4.44: Year 5 (2015) Base Scenario

	AM Peak			PM Peak			Saturday Peak		
	Flow	**DOS**	**Q**	**Flow**	**DOS**	**Q**	**Flow**	**DOS**	**Q**
Lady Margaret Rd	436	96%	18	432	97%	19	519	117%	55
A4020 East	605	112%	53	517	98%	23	559	106%	38
South Road	550	107%	39	505	100%	24	538	106%	36
A4020 West	221	122%	49	724	141%	59	598	141%	40

Table 4.45: Year 5 (2015) Base + Development

	AM Peak			PM Peak			Saturday Peak		
	Flow	**DOS**	**Q**	**Flow**	**DOS**	**Q**	**Flow**	**DOS**	**Q**
Lady Margaret Rd	471	104%	29	504	113%	48	608	137%	101
A4020 East	608	107%	42	522	94%	19	562	101%	29
South Road	598	107%	38	611	121%	73	653	129%	95
A4020 West	729	103%	39	740	102%	42	626	114%	32

Table 4.46: Year 10 (2020) Base Scenario

	AM Peak			PM Peak			Saturday Peak		
	Flow	**DOS**	**Q**	**Flow**	**DOS**	**Q**	**Flow**	**DOS**	**Q**
Lady Margaret Rd	446	100%	22	446	100%	23	537	121%	64
A4020 East	630	117%	66	539	103%	30	581	111%	48
South Road	569	111%	48	523	103%	30	556	110%	44
A4020 West	750	127%	62	752	153%	73	622	147%	44

Table 4.47: Year 10 (2020) Base + Development

	AM Peak			PM Peak			Saturday Peak		
	Flow	**DOS**	**Q**	**Flow**	**DOS**	**Q**	**Flow**	**DOS**	**Q**
Lady Margaret Rd	502	113%	47	555	113%	48	664	148%	127
A4020 East	639	115%	63	566	102%	30	593	104%	35
South Road	682	135%	111	683	135%	111	733	130%	96
A4020 West	761	110%	57	777	120%	63	666	127%	41

Table 4.48: Year 15 (2025) Base Scenario

	AM Peak			PM Peak			Saturday Peak		
	Flow	**DOS**	**Q**	**Flow**	**DOS**	**Q**	**Flow**	**DOS**	**Q**
Lady Margaret Rd	467	103%	27	462	104%	29	557	153%	139
A4020 East	655	121%	80	560	107%	29	606	118%	68
South Road	590	115%	58	542	107%	38	576	147%	146
A4020 West	780	111%	76	783	159%	88	647	195%	72

Table 4.49: Year 15 (2025) Base + Development

	AM Peak			PM Peak			Saturday Peak		
	Flow	**DOS**	**Q**	**Flow**	**DOS**	**Q**	**Flow**	**DOS**	**Q**
Lady Margaret Rd	514	116%	53	574	129%	83	678	151%	135
A4020 East	667	120%	78	595	107%	42	620	109%	47
South Road	726	165%	195	698	138%	120	746	130%	97
A4020 West	791	114%	70	806	123%	76	690	130%	46

5 SOUTH ROAD BUS PRIORITY SCHEME

5.1 The results of the various modelling exercises indicate that whereas it is possible to broadly mitigate the potential impacts of the development along the A312 corridor to the west of the Site, there will be increased congestion and queuing along South Road to the east of the development. This assumes the estimated level of traffic generation. In reality, it is likely that the generation would be lower than the estimate due to people changing their mode or time of travel to avoid congestion and minimise inconvenience.

5.2 The proposals associated with the planning application include increasing the capacity along the South Road corridor through widening the bridge over the railway plus increasing the capacity at the South Road junctions with Park Avenue and Merrick Road. The capacity of the existing bridge together with activity outside of Southall Station results in long queues currently forming on the eastern, western and northern approaches to the South Road / Park Avenue junction in the morning peak, and long queues forming on the southern and northern approaches in the evening peak due to activity in Southall town centre.

5.3 Journey time surveys of buses were conducted on 28th April 2009 between stops on Lady Margaret Road and The Green to ascertain bus journey times along the corridor. The results of the surveys, conducted between 07h30 and 09h30 in the morning and again between 16h30 and 18h30 in the evening are summarised in Table 5.1 below.

Table: 5.1: Summary of Bus Journey Times (in seconds)

Period	Minimum Journey Time	Maximum Journey Time	Average Journey Time
AM Peak (07h30 to 09h30) – Northbound (5 journeys)	325	405	349
AM Peak (07h30 to 09h30) – Southbound (5 journeys)	418	548	476
PM Peak (16h30 to 18h30) – Northbound (5 journeys)	579	795	673
PM Peak (16h30 to 18h30) – Southbound (4 journeys)	448	506	474

5.4 These journey times translate to average speeds of circa 13km/hr and 6km/hr for the northbound journey in the morning and evening peak respectively assuming a total of approximately 2 minutes for downtime at the bus stops, and 9km/hr during both peaks for southbound journeys.

5.5 Public transport is considered key to the success of the redevelopment of the Site, particularly to the east of the Site in Southall Town Centre where it is acknowledged that it is neither possible nor appropriate to mitigate demand flows. The submitted Transport Assessment suggested that it would be possible to prioritise buses along the South Road corridor through adjusting the signal timings. However, although it recognised that it would be possible to assist the flow of buses along the corridor in this manner, Transport for London has stated that it is necessary to implement additional bus priority measures in Southall Town Centre.

5.6 In this regard, Transport for London has indicated that given current and anticipated levels of congestion, although a bus lane in both directions is ideal, the introduction of a northbound bus lane as illustrated on Drawing 52212/B/49 (**Appendix 3A**) would provide the greatest benefits. The implementation of the northbound bus lane on the South Road corridor between the Red Cross Head Quarter and Hamilton Road would have the following benefits:

- Improvement in northbound bus journey times.
- Southbound bus journey times will be improved through the removal of the bottleneck created by the existing bus stops outside Southall Station.
- Journey times for general traffic are also anticipated to be improved through the implementation of the proposed bus lane. Currently, general traffic is delayed when buses stop thereby creating an obstruction.
- The removal of car parking on the western side of South Road will facilitate bus movement and remove the existing conflict between buses and general traffic parking on South Road.

5.7 Although there are short sections of existing southbound bus lanes along South Road, the primary cause of southbound delay to all traffic is associated with activity outside Southall Station. The need for a southbound bus lane will be monitored. Drawing 52212/B/42 Rev A (**Appendix 3A**) illustrates how a southbound bus lane could be implemented along South Road in addition to the proposed northbound bus lane.

6 PHASING AND CONSTRUCTION

6.1 Section 10 of the submitted Transport Assessment included an indicative phasing and construction programme for the site along with off-site highway mitigation measures. Although there have not been any changes to the anticipated construction programme for the Site, the text below clarifies the envisaged phasing for Site Access and off-site highway mitigation measures:

- No construction shall take place on Site prior to the opening of the Pump Lane Construction Access as shown on Drawing 52212/B/51. The access will not be for use by occupiers of the Site other than for retained Airport Parking if the route is deemed safe by National Grid and appropriate by the planning authority.
- No more than 400 dwellings to be occupied using the three Beaconsfield Road Accesses as shown on Drawings 52212/B/49, 52212/B/50 and 52212/B/51.
- No more than 400 dwellings to be occupied prior to the opening of the South Road / Eastern Access as shown on Drawings 52212/B/43.
- No more than 800 Development Units to be occupied prior to the completion of the South Road Bus Priority Scheme as shown on Drawings 52212/B/42.
- No more than 800 Development Units to be occupied prior to the completion of the South Road / Merrick Road improvement scheme as shown on Drawings 52212/B/46.
- No more than 1,350 Development Units to be occupied prior to the completion of the A312 Hayes By-pass / North Hyde Road (Bulls Bridge) improvement scheme as shown on Drawings 52212/B/48.
- No more than 1,500 Development Units to be occupied prior to the completion of the M4 J3 junction improvement scheme as shown on Drawings 52212/B/31.
- No more than 1,750 Development Units to be occupied prior to the completion of the A312 Hayes By-pass / Pump Lane junction improvement scheme as shown on Drawings 52212/B/33.
- No more than 1,750 Development Units to be occupied prior to the completion of the Pump Lane / Western Access junction improvement scheme as shown on Drawings 52212/B/34.
- The improvement works to the Bulls Bridge junction will be carried out prior to the improvement works at M4 J3.

7 SUMMARY AND CONCLUSION

7.1 National Grid submitted a planning application in October 2008 for the comprehensive redevelopment of the former gasworks site (the "Site") in Southall. The planning application was accompanied by a Transport Assessment covering all aspects including several models of junctions in and around Southall.

7.2 Regular meetings have been held with Ealing Council, Transport for London and the Highways Agency since the submission to discuss the planning application, and the various junction assessment models have been audited by AECOM on behalf of Transport for London and the Highways Agency, and by JCT on behalf of Ealing Council. In addition, Stage 1 Road Safety Audits have been conducted by White Young Green (Leicester).

7.3 The key points are summarised below:

- The Bulls Bridge proposed layout has been modified to create an elongated junction in place of the "Hamburger Style" junction proposed in the Transport Assessment on the grounds it provides greater internal circulatory capacity.
- The Safety Audits revealed several minor issues some of which have been included on revised drawings; the remainder will be addressed at the Detailed Design Stage.
- The model audits by both AECOM and JCT resulted in modifications to the models. The assessments based on the revised models illustrate that the majority of existing junctions operate at or close to capacity under existing conditions, with queue lengths and congestion levels anticipated to increase should growth and demand flows materialise.
- The results of the revised models for the proposed layouts illustrate that it will be possible to broadly mitigate the potential impact of the development traffic along the A312 corridor even taking in to account background growth and anticipated demand flows.
- The results of the modified models for the South Road corridor illustrate that queue lengths and levels of congestion are anticipated to increase if growth and potential demand flows are realised.
- The proposals now include the creation of a northbound bus lane on South Road between the Red Cross Headquarters and Hamilton Road which can be introduced

at the existing section of southbound bus lane between Cambridge Road and the supermarket car park access.

7.4 In conclusion, the modifications to the various junction capacity assessments brought about as a result of the auditing processes and consultation do not alter the conclusions within the submitted Transport Assessment.

APPENDIX 3A

APPENDIX 4A-4H

[Included on CD]