

Position Statement from National Highways

Title:	National Highways Update – Furnessing Methodolgy
Reference:	TR050007
Applicant:	Tritax Symmetry
Proposal:	Application by Tritax Symmetry (Hinckley) Limited for an Order Granting Development Consent for the Hinckley National Rail Freight Interchange
Author:	National Highways (20040073)
Date:	09 January 2024

National Highways (“we”) has been appointed by the Secretary of State for Transport as strategic highway company under the provisions of the Infrastructure Act 2015 and is the highway authority, traffic authority and street authority for the Strategic Road Network (SRN). The SRN is a critical national asset and as such we work to ensure that it operates and is managed in the public interest, both in respect of current activities and needs as well as in providing effective stewardship of its long-term operation and integrity.

This note has been produced by National Highways, with the support of its consultants AECOM, as we have reviewed the furnessing methodology which was supplied by the applicants consultants, BWB Consulting, at deadline 3.

Based on this appraisal, we have a number of matters where further information and clarification are required. Our full review is provided in Annex 1 of this document, based on this the National Highways has identified the following matters need to be addressed, and therefore at this time we are unable to agree the furnessing methodology at present.

1. The Applicant has not responded to National Highway’s comments as set out in the DCO document REP1-182.
2. No junction turn matrices forecasts were produced in the “Furnessing Spreadsheet” at the M1 junction 20 two-bridge roundabout nor at the A5 ‘Redgate’ elongated roundabout.

3. The “Furness spreadsheet” does not document the grade separated flows at M69 junction 1 and at M69 junction 2. This means that the turning movement matrices cannot be used to assess the future operation efficiency of the M69 slip road merge areas.
4. The Furnessing process could underestimate the magnitude of the HGV turn movements between A5 North and A4303 East at the A5 ‘Cross In Hand’ roundabout if new HGV trips are induced between the Applicant’s Hinkley NRFI site and the existing Magna Park regional distribution centre.
5. Directional traffic growth biases in the target flows were noted at the A5 ‘Gibbet’ roundabout. The operational performance of this roundabout should be assessed with alternative turning movement proportions applied to check that these biases are not material to the operational performance of the roundabout.

TR050007

*Application by Tritax Symmetry (Hinckley) Limited for an Order
Granting Development Consent for the Hinckley National Rail
Freight Interchange*



ANNEX A:

*AECOM Review of Furnessing Methodology on behalf of
National Highways*

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Project: Hinckley NRFI

Author: David Elliott
Associate Transport
Planner,
Technical Authority on
Traffic Models

Subject: Review of Furnessing Spreadsheet (received 18 Dec 2023)

Reviewed:

Date: 8th January 2024

Approved: Daniel Law

1. Introduction

National Highways provided a written response – dated 3rd October 2023 – to information submitted to the Hinkley NRFI Development Consent Order (DCO) examination. This written response was allocated the DCO library reference **REP1-182**.

The Applicant has proposed a method of forecasting the traffic flow turning movements for various scenarios – with and without the development and with and without mitigation – at the key junctions using a “Furness” method.

This method starts with a matrix of the observed turning movements at each junction and then modifies these matrices – using a process of successive matrix row and column factoring – such that the row totals and column totals match the forecast approach and exit flows extracted from a strategic traffic forecasting model. In this case the strategic traffic forecasting model was a version of the Pan-Regional Transport Model (PRTM) developed jointly for Leicestershire County Council and Leicester City Council and used forecasting years of 2026 and 2036.

The “Furnessing Methodology” was reviewed by National Highways and comments were recorded as set out in **Appendix B** of **REP1-182** (see *PDF page 120 of 183 and the table on the subsequent pages 122 to 125*). In this REP1-182 table, National Highways made some ‘General Observation’ (GO) comments and listed two items of ‘Concern’ (C). The concern comments are reproduced in Figure 1 below:

Figure 1

Issue		Planning Inspectorate Project Reference: TR050007 Environmental Statement Volume 2: Appendices Appendix 8.1: Transport Assessment (part 9 of 20) "Furness Methodology" Document Reference: 6.2.8.1, Revision: 07, Dated: September 2023 BWB document number: HNRFI-BWB-GEN-XX-RP-TR-0022-S4-P03, Furnessing Methodology BWB Reference: NTT2814, Revision 4, Status S4, Issue date: 04/09/2023	Applicant's Response/Action											
3.3	(C)	<p>The objective of the Furness process is to provide forecast turning flows at each junction of interest without and with the proposed Hinckley NRFI highway improvements in place. For the forecasts with the trips generated by the Hinckley NRFI development, these were only assigned to the highway networks with the proposed Hinckley NRFI highway improvements.</p> <p>i.e.</p> <table border="1"> <thead> <tr> <th rowspan="2">Assigned to highway network:</th> <th colspan="2">Traffic forecast scenario (2026 & 2036)</th> </tr> <tr> <th>Without (WO) Dev trips</th> <th>With Hinckley NRFI trips</th> </tr> </thead> <tbody> <tr> <td>Future (committed schemes)</td> <td>A: Without (WO) Dev</td> <td></td> </tr> <tr> <td>Future + NRFI improvements</td> <td>D: WO Dev + Infrastructure</td> <td>C: With Dev + Infrastructure</td> </tr> </tbody> </table> <p>These three forecast flows sets (A, C, D) may be used to understand the environmental impacts of the Hinckley NRFI infrastructure improvements and may be used for operational junction modelling with Hinckley NRFI trips included in the forecasts.</p> <p>These three forecasts flow sets will not identify if a junction or link to be improved is unnecessary. This might be a concern if:</p> <ol style="list-style-type: none"> Environmental impacts are unnecessarily incurred. Carbon budget expended on unnecessary construction. Traffic management during construction delays existing users. There are no traffic forecasts to inform the construction phasing programme. 	Assigned to highway network:	Traffic forecast scenario (2026 & 2036)		Without (WO) Dev trips	With Hinckley NRFI trips	Future (committed schemes)	A: Without (WO) Dev		Future + NRFI improvements	D: WO Dev + Infrastructure	C: With Dev + Infrastructure	
Assigned to highway network:	Traffic forecast scenario (2026 & 2036)													
	Without (WO) Dev trips	With Hinckley NRFI trips												
Future (committed schemes)	A: Without (WO) Dev													
Future + NRFI improvements	D: WO Dev + Infrastructure	C: With Dev + Infrastructure												
4.5	(C)	<p>For the junctions along the development's Spine Road, it is noted that forecast traffic flow matrices will be derived from the reassigned traffic attracted to the Spine Road – as forecasts by PRTMv2.2 – and combined with a 'first principals' method to distribute the trips generated by the proposed development. This method is considered to be a reasonable approach.</p> <p>This paragraph does not explain how the double counting of trips generated by the proposed development (i.e. generated in the PRTMv2.2 forecasts, which loads the trips at a single development zone, and trips added by the 'first principals' method) was addressed.</p>												

The Summary of National Highway's comments given in **Appendix B** of **REP1-182** (see PDF page 126 of 183) are reproduced in Figure 2 below:

Figure 2:

Summary of National Highway's Comments:
<ol style="list-style-type: none"> The approach described is generally considered to be sound. The 'Furness' process is a common method used to adjust turning movement flows to match given target forecast flows entering and exiting a junction (i.e. doubly constrained adjustment). A 'Furness' processed was applied to 'Prior' matrices that were derived from observed turning movements. However, this method of deriving Prior matrices is ineffective where the junctions would be substantially changed, specifically the two junctions at the north and the south accesses to the development site. The standard method of deriving 'Prior' matrices was adapted to instead derive 'Prior' matrices from the pan regional strategic traffic model's forecast outputs (PRTMv2.2) at these two junctions. This alteration to the agreed approach is reasonable. Whilst the general approach to applying the Furness Process is acceptable, two areas of concern were identified: <ul style="list-style-type: none"> Where an observed (2018/19) turning movement is zero, or close to zero, the Furness Process will not reflect a reassignment of traffic into the corridor where this is indicated as an effect of the scheme by the forecasting scenario outputs from the PRTM v2.2 traffic forecast model. There is a risk of underestimating the demand for a turning movement at an assessed junction. Where a large observed (2018/19) turning movement has had negative growth applied, due to reassignment effects in the PRTM v2.2 forecast outputs, then this could result in the suppression of a flow demand. This might be important to the junction's operational assessment if the suppressed flow demand is (say) a right turn. These two concerns may be addressed by undertaking a sense check using the PRTM reassignment impacts and turn movements; paying particular attention to the magnitude of flows that turn right at an assessed junction. Alternatively, the operational assessments of the junctions could include sensitivity testing of the derived turning proportions. For those junctions along the Development's spine road, the report contains no description of how design reference flows were derived from PRTMv2.2 forecast outputs (which model loads all development trips at a single zone) combined with a 'first principals' method of distributing trips generated by the development. It is noted that the design of the spine road is not a specific concern for the Strategic Road Network (SRN), such as the M69, A5, M1 corridors. There is no traffic forecasting set for the scenario 'With development generated trips' demand assigned to a 'Without HNF infrastructure network'. This forecasting set would identify if all the link and junction improvements are necessary. This forecasting set would also assist in determining construction phase timing and sequencing of improvements.

On 18th December 2023, an email from BWB Consulting to National Highways attached an Excel workbook containing a “Furnessing spreadsheet”.

The next section 2 contains a summary of the contents of the “Furnessing spreadsheet” and the last section 3 contains National Highway’s comments.

2. Summary of “Furnessing Spreadsheet” Contents

The supplied “Furnessing spreadsheet” contained 2026 and 2036 forecast year turning movements, for the AM and PM peak hours (in units of Vehicles/hour and PCU/hour), for light and heavy vehicle types.

The eleven junctions – in the bullet-point list below – were processed to produce forecast year turning movements and the turn matrices were tabulated in the “Furnessing spreadsheet”.

- J1 – Ashby Road (A447) / A47.
- J37 – Hinckley Rd / New Rd / B581.
- J39 – B4669 / Stanton Lane.
- J3 – Coventry Rd (B4114) / B581 Broughton Rd.
- J13 – M69 Junction 1 / A5.
- J14 – A5 / B4666 / A47. (Dodwells Roundabout).
- J4 – A5 / A47 The Long Shoot.
- J27 – A5 / A4303 / B4027 / Coal Pit Ln. [~~J24~~].
- J15 – M1 Junction 21 / M69 Junction 3 / A5460. [~~J6~~].
- J20 – M69 Junction 2
- J26 – Gibbet Roundabout (A5 / A426 / Rugby Rd)

Note: the ‘J’ numbers in the bullet-point list above correspond to the ‘J’ numbers used in the Transport Assessment [APP-155] as junctions identified for further assessment in its **Table 7-1**. Refer to extract at Figure 3 below. The junctions in the above bullet point list are highlighted yellow.

It is noted that some of the junction numbers used in the “Furness spreadsheet” are not consistent between sheets nor with Table 7-1. Care is needed when using the forecast turning movements tabulated in the “Furness spreadsheet” that the correct junction is being examined.

Figure 3: Table 7-1 Extracted From Applicant's Transport Assessment

Table 7-1: Initially Identified Junctions within the AOI for further Assessment

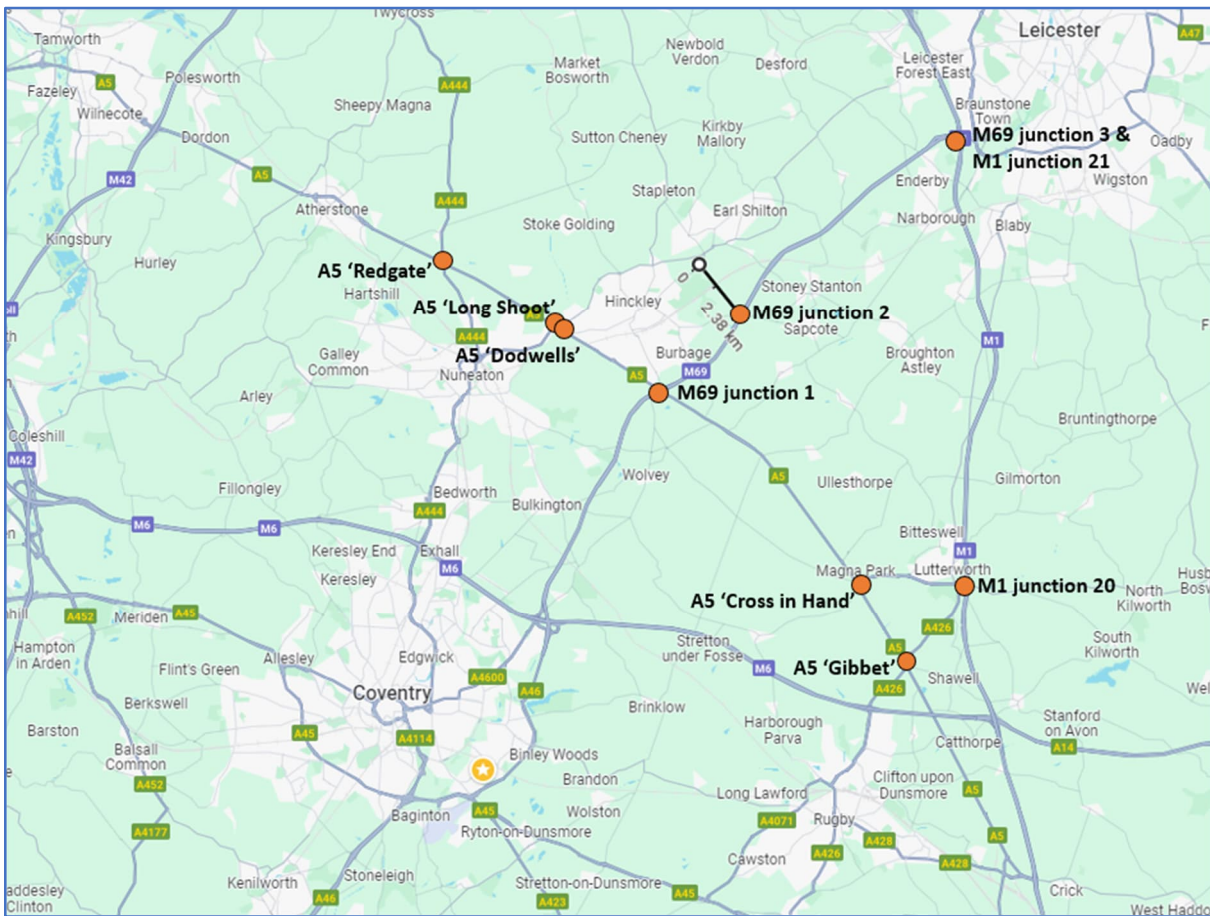
Junction Type	JCT ID	Survey Jct Ref	Junction	Location
Signal Controlled	J1	13	Ashby Rd / A47	Hinckley
	J2	15	A47 / B581	Earl Shilton
	J3	21	B4114 Coventry Rd / B581 Broughton Rd	East of Stoney Stanton
	J4	26	A47 / A5 (Longshoot)	Between Hinckley and Nuneaton
	J5	27	Rugby Rd / Brookside	Hinckley
	J6	50	Coventry Rd / Croft Rd	Croft
	J7	-	A563 / A5460	Leicester
	J8	65	A47 / Wilkinson Lane	Earl Shilton
	J9	66	A47 / B582 Desford Road	Between Hinckley and Leicester
	J10	-	Braunstone crossroads	Leicester
	J11	-	B581/Cosby Road, Broughton Astley	Broughton Astley
	J12	-	Rugby Road/Hawley Road, Hinckley	Hinckley
Signalised Roundabout	J13	22	M69 Junction 1 / A5	South of Hinckley
	J14	25	A5 / B4666 / A47 (Dodswells)	SW of Hinckley
	J15	-	M1 Junction 21 / M69 Junction 3	Leicester
	J16	-	M6 Junction 2	Coventry
	J17	-	Narborough Rd Roundabout	Leicester
	J18	-	M6 Junction 3	Coventry
	J19	-	B4114/Foxhunter roundabout	SW of Leicester
Roundabout	J20	52	M69 Junction 2	Site access
	J21	14	A47 Leicester Rd / Clickers Way / Carrs Hill	Barwell
	J22	23	A5 / Logix Rd	South of Hinckley
	J23	24	A5 / Hammonds Way	South of Hinckley
	J24	29	The Common Barwell / A47 / B4668 Leicester Rd	Barwell
	J25	-	M1 Junction 20	Lutterworth
	J26	47	A5 / A426 / Gibbet Ln	South of Lutterworth
	J27	48	A5 / A4303 / B4027 / Coal Pit Ln	Magna Park
	J28	-	Lubbesthorpe Way Roundabout	Leicester
	J29	-	A47 / A4254 Eastboro Way	Nuneaton
	J30	68	A5 / Higham Ln / Nuneaton Ln	West of Hinckley
	J31	-	A47/Leicester Road roundabout	North of Earl Shilton
	J32	-	A5/Royal Redgate	West of Hinckley
	J33	-	A5/A444 Fenny Drayton	West of Hinckley
	J34	-	A5/MIRA	West of Hinckley
	J35	-	A4303 Frank Whittle	Lutterworth
	J36	-	Shilton Road mini-roundabout, Barwell	South of Earl Shilton
Mini roundabout	J37	17	Hinckley Rd / New Rd / B581	Stoney Stanton
	J38	18	New Rd / Long St / Broughton Rd	Stoney Stanton
	J39	19	B4669 / Stanton Ln	Sapcote

3. “Furnessing Spreadsheet” Contents – SRN Junctions

National Highways has been appointed by the Secretary of State for Transport as the strategic highway company under the provisions of the Infrastructure Act 2015 and is the highway authority, traffic authority and street authority for the Strategic Road Network (SRN), i.e. trunk roads. National Highway’s role is to maintain the safe and efficient operation of the SRN whilst acting as a delivery partner to national economic growth.

The SRN routes within the area of interest include: M69, M1 and A5.

Figure 3: SRN Junctions In The Area Of Interest On: M69, M1, A5



The forecast tuning movements at nine of these junctions with connections to the SRN roads were examined in more detail. The locations of the nine junctions are labelled in Figure 3 above.

The following pages present extracts from the Applicant’s “Furnessing spreadsheet” for the 2036 traffic forecasting year. Traffic flows and turning movements are presented in units of PCU/hour, where a PCU (passenger car unit) is equal to one car or half of a heavy goods vehicle. That is to say, in the subsequent capacity assessments, observed and modelled heavy goods vehicles (HGV) were assumed to occupy the capacity of two cars. Converting vehicles to PCU is a standard practice when modelling junction capacity.

In the following extracts from the “Furnessing spreadsheet”:

- WoD means ‘Without Development’,
- WoDWS means ‘Without Development / With the Applicant’s highway Schemes’, and
- WD means ‘With Development’ (including highway scheme improvements).

M69 junction 1 / A5 (Stretton Baskerville)

		TA Table 7-1 Ref:		Survey Jct Ref:		PRTM node:																												
		J13		22		40168																												
AM Peak (PCU/Hour)		SURVEY FLOW		FUTURE YEAR FURNESSED TRAFFIC MATRICES																														
Junction Arm		2023 Observed Flows		WoD 2036 FINAL MATIX		WoDWS 2036 FINAL MATIX		WD 2036 FINAL MATIX																										
J13 - M69 Junction 1 / A5	A	Rugby Road N	A	0	99	186	180	685	13	1163	A	0	92	176	144	718	7	1137	A	0	150	268	193	581	9	1201	A	0	156	236	228	586	11	1217
	B	M69 E	B	25	0	46	153	3	276	503	B	38	0	66	197	3	264	568	B	70	0	125	339	3	429	966	B	67	0	195	377	5	439	1083
	C	AS S	C	127	28	0	10	349	430	944	C	176	27	0	9	500	423	1135	C	179	37	0	10	312	391	929	C	169	93	0	11	320	392	985
	D	Hinckley Road S	D	68	155	6	0	8	72	309	D	122	225	6	0	15	70	438	D	130	260	7	0	8	67	472	D	148	322	10	0	10	77	567
	E	M69 W	E	231	2	187	3	11	363	797	E	408	3	332	3	17	393	1156	E	295	2	263	2	8	261	831	E	300	3	283	3	8	245	842
	F	AS N	F	6	249	410	102	355	3	1125	F	7	225	502	99	414	3	1250	F	7	299	567	103	282	3	1261	F	7	353	501	118	270	3	1252
	TOTAL		TOTAL	457	533	835	448	1411	1157	4841	TOTAL	751	572	1082	452	1667	1160	5684	TOTAL	681	748	1230	647	1194	1160	5660	TOTAL	691	927	1225	737	1199	1167	5946
PM Peak (PCU/Hour)		SURVEY FLOW		FUTURE YEAR FURNESSED TRAFFIC MATRICES																														
Junction Arm		2023 Observed Flows		WoD 2036 FINAL MATIX		WoDWS 2036 FINAL MATIX		WD 2036 FINAL MATIX																										
J13 - M69 Junction 1 / A5	A	Rugby Road N	A	0	66	159	108	226	21	580	A	0	60	154	111	354	25	704	A	0	129	164	115	298	27	733	A	0	112	169	123	314	26	744
	B	M69 E	B	102	0	59	153	1	197	512	B	107	0	52	144	1	198	502	B	176	0	79	233	2	319	809	B	199	0	205	273	2	412	1091
	C	AS S	C	234	23	0	15	139	470	881	C	346	13	0	20	282	715	1376	C	335	30	0	20	232	719	1336	C	322	79	0	20	243	694	1358
	D	Hinckley Road S	D	178	133	8	0	34	100	453	D	191	120	7	0	44	114	476	D	183	235	8	0	35	113	574	D	201	218	8	0	38	118	583
	E	M69 W	E	587	4	335	17	12	446	1401	E	740	4	404	12	22	592	1774	E	443	5	282	7	10	382	1129	E	474	4	318	9	11	371	1187
	F	AS N	F	20	200	376	92	297	1	986	F	21	149	401	78	433	1	1083	F	20	301	399	75	340	1	1136	F	20	287	373	77	331	1	1089
	TOTAL		TOTAL	1121	426	937	385	709	1235	4813	TOTAL	1405	346	1018	365	1136	1645	5915	TOTAL	1157	700	932	450	917	1561	5717	TOTAL	1216	700	1073	502	939	1622	6052

At M69 junction 1, the journeys between M69 East (arm B) and M69 West (arm E) are grade separated and therefore these trips bypass the roundabout and are not documented in the above turn matrices. This means that the above forecast turning movement matrices cannot be used to assess the future operation efficiency of the M69 slip road merge areas.

In the AM peak hour, the total 2023 flows observed to arrive at the junction were 4,841PCU/hour in the 2023 AM peak. Without Development (WoD) trips, in 2036 the total AM peak flows arriving at the junction would be 5,684PCU/hour (+17%). Most of this AM traffic growth is attributed to the SRN routes from A5 South (+20%) and from M69 West (+45%).

In the PM peak hour, the total 2023 flows observed to arrive at the junction were 4,813PCU/hour in the 2023 PM peak. Without Development (WoD) trips, in 2036 the total PM peak flows arriving at the junction would be 5,915PCU/hour (+23%). Most of this PM traffic growth is attributed to the SRN routes from A5 South (+56%) and from M69 West (+24%).

The effect of the proposed infrastructure improvements (WoDWS) would not materially change the levels of future year traffic flows but would change the directions of arrival – by reassignment – such that more flow arrives from the M69 East. This result appears logical given that the proposed highway infrastructure would provide a bypass to the east of Hinkley and redirect some existing journeys on the A47 via M69 junction 2.

The impact of the full development (WD) would be to increase 2036 forecast total inflows at M69 junction 1 by (5,946-5,684=) 262PCU/hour (+5%) in the AM peak and by (6,052-5,915=) 137PCU/hour (+2%) in the PM peak.

The outputs from the Furness process at M69 junction 1 are reasonable.

M69 junction 2 / B4669:

TA Table 7-1 Ref:

Survey Jct Ref:

PRTM nodes:

J20

52

30504, 30197, 37003, 30196

AM Peak (PCU/Hour)		SURVEY FLOW		FUTURE YEAR FURNESSED TRAFFIC MATRICES																						
Junction Arm		2023 Observed Flows					WoD 2036 FINAL MATIX					WoDWS 2036 FINAL MATIX					WD 2036 FINAL MATIX									
		A	B	C	D	E	TOTAL	A	B	C	D	E	TOTAL	A	B	C	D	E	TOTAL	A	B	C	D	E	TOTAL	
J20 - M69 Junction 2	A	M69 SB Off Slip	0	29	0	134	0	163	0	11	0	63	0	74	0	12	1	95	69	177	0	9	1	89	330	429
	B	Hinkley Rd E	161	2	0	324	0	487	160	2	0	425	0	587	87	0	588	156	180	1011	80	0	596	134	274	1084
	C	M69 NB Off Slip	0	0	0	0	0	0	0	0	0	0	0	0	0	313	0	2	421	736	0	295	0	1	900	1196
	D	Hinkley Rd W	433	258	0	2	0	693	434	276	0	2	0	712	407	153	15	0	61	636	413	164	15	0	135	727
	E	Site Access	0	0	0	0	0	0	0	0	0	0	0	0	135	118	761	2	0	1016	232	103	1032	4	0	1371
TOTAL		594	289	0	460	0	1343	594	289	0	490	0	1373	629	596	1365	255	731	3576	725	571	1644	228	1639	4807	
PM Peak (PCU/Hour)		SURVEY FLOW					FUTURE YEAR FURNESSED TRAFFIC MATRICES																			
Junction Arm		2023 Observed Flows					WoD 2036 FINAL MATIX					WoDWS 2036 FINAL MATIX					WD 2036 FINAL MATIX									
		A	B	C	D	E	TOTAL	A	B	C	D	E	TOTAL	A	B	C	D	E	TOTAL	A	B	C	D	E	TOTAL	
J20 - M69 Junction 2	A	M69 SB Off Slip	0	149	0	252	0	401	0	144	0	183	0	327	0	80	0	126	104	310	0	73	0	117	257	447
	B	Hinkley Rd E	53	0	0	240	0	293	36	0	0	268	0	304	36	0	270	160	125	591	21	0	296	147	71	535
	C	M69 NB Off Slip	0	0	0	0	0	0	0	0	0	0	0	0	0	572	0	16	812	1400	0	575	0	16	1042	1633
	D	Hinkley Rd W	140	369	0	3	0	512	77	439	0	3	0	519	119	184	2	0	142	447	110	157	1	0	147	415
	E	Site Access	0	0	0	0	0	0	0	0	0	0	0	0	47	97	364	7	0	515	335	209	925	22	0	1491
TOTAL		193	518	0	495	0	1206	113	583	0	454	0	1150	202	933	636	309	1183	3263	466	1014	1222	302	1517	4521	

At M69 junction 2, the journeys between M69 Northeast (arm A) and M69 Southwest (arm C) are grade separated and therefore these trips bypass the roundabout and are not documented in the above turn matrices. This means that the above forecast turning movement matrices cannot be used to assess the future operation efficiency of the M69 slip road merge areas – which is likely to be a requirement in the WoDWS and WD cases given that the forecast flow to arm C is 1,365 & 1,644PCU/hour in the AM peak, and 636 & 1,222 PCU/hour in the PM peak. These forecasts traffic flow will use the proposed new southbound merge slip road.

In the AM peak hour, the total 2023 flows observed to arrive at the junction were 1,343PCU/hour in the 2023 AM peak. Without Development (WoD) trips, in 2036 the total AM peak flows arriving at the junction would be 1,373PCU/hour (+2%). This AM traffic growth is attributed westbound to the route from B4669 Hinkley Rd East (arm B) to B4669 Hinkley Rd West (arm D).

In the PM peak hour, the total 2023 flows observed to arrive at the junction were 1,206PCU/hour in the 2023 PM peak. Without Development (WoD) trips, in 2036 the total PM peak flows arriving at the junction would be 1,150PCU/hour (-5%). Most of this PM traffic reduction is attributed to the SRN routes from M69 Northeast (-18%).

The effect of the proposed infrastructure improvements (WoDWS) would change the levels of 2036 forecast traffic flows on the M69 junction 2 roundabout. The total inflows would increase from 1,373PCU/hour to 3,576PCU/hour in the AM peak hour. This is an increase of 2,203PCU/hour (+160%). In the PM peak hour, the total inflows would increase from 1,150PCU/hour to 3,263PCU/hour. This is an increase of 2,113PCU/hour (+184%). This result appears logical given that the proposed highway infrastructure would provide a bypass to the east of Hinkley and redirect some existing journeys on the A47 via M69 junction 2.

The impact of the full development (WD) would be to increase 2036 forecast total inflows at M69 junction 2 roundabout by (4,807-1,374=) 3,433PCU/hour (+250%%) in the AM peak and by (4,521-1,150=) 3,371PCU/hour (+290%) in the PM peak.

The Furness process applied to the M69 junction 2 observed 2023 turning movement flows has had very little effect. Most of the turn movement changes at the M69 junction 2 roundabout have been derived from absolute changes in the PRTM strategic transport model outputs for the forecasting scenarios tested.

M1 junction 21 / M69 Junction 3 (at Fosse Park, Leicester):

TA Table 7-1 Ref: J15 | Survey Jct Ref: None | PRTM nodes: 9463, 9495, 9447, 9439

AM Peak (PCU/Hour)		SURVEY FLOW					FUTURE YEAR FURNESSED TRAFFIC MATRICES														
Junction Arm		2023 Observed Flows					WoD 2036 FINAL MATIX				WoDWS 2036 FINAL MATIX				WD 2036 FINAL MATIX						
		A	B	C	D	TOTAL	A	B	C	D	TOTAL	A	B	C	D	TOTAL	A	B	C	D	TOTAL
J15-M1 Junction 21 / M69 Junction 3	A M1 N	6	649	1	1429	2085	6	732	1	1555	2294	6	734	1	1560	2301	6	701	1	1556	2264
	B A5460 E	1765	0	688	1118	3571	1859	0	940	1403	4202	1869	0	946	1367	4182	1847	0	915	1476	4238
	C M1 S	0	574	2	3	579	0	444	2	3	449	0	444	4	3	451	0	446	2	3	451
	D M69	1523	1143	2	2	2670	1470	1332	3	2	2807	1473	1324	3	2	2802	1439	1353	3	2	2797
	TOTAL	3294	2366	693	2552	8905	3335	2508	946	2963	9752	3348	2502	954	2932	9736	3292	2500	921	3037	9750
PM Peak (PCU/Hour)		SURVEY FLOW					FUTURE YEAR FURNESSED TRAFFIC MATRICES														
Junction Arm		2023 Observed Flows					WoD 2036 FINAL MATIX				WoDWS 2036 FINAL MATIX				WD 2036 FINAL MATIX						
		A	B	C	D	TOTAL	A	B	C	D	TOTAL	A	B	C	D	TOTAL	A	B	C	D	TOTAL
J15-M1 Junction 21 / M69 Junction 3	A M1 N	23	1313	1	1371	2708	22	1344	1	1502	2869	22	1388	1	1512	2923	22	1385	1	1525	2933
	B A5460 E	1699	0	643	1188	3530	1633	0	874	1416	3923	1706	0	888	1394	3990	1730	0	889	1430	4049
	C M1 S	0	432	0	11	443	0	456	0	13	469	0	466	0	13	479	0	473	0	13	486
	D M69	1730	692	3	0	2425	1648	753	4	0	2405	1694	747	4	0	2445	1664	761	4	0	2429
	TOTAL	3452	2437	647	2570	9106	3303	2553	879	2931	9666	3422	2601	893	2921	9837	3416	2619	894	2968	9897

In the AM peak hour, the modelled total inflows arriving at the junction were 8,905PCU/hour in the 2023 AM peak. Without Development (WoD) trips, in 2036 the total AM peak flows arriving at the junction would be 9,752PCU/hour (+10%). This AM traffic growth is attributed between three approach roads (M1 North, M69 West and A5460 East).

In the PM peak hour, the modelled total inflows arriving at the junction were 9,106PCU/hour in the 2023 PM peak. Without Development (WoD) trips, in 2036 the total PM peak flows arriving at the junction would be 9,666PCU/hour (+6%). This PM traffic growth is attributed between two approach roads (M1 North and A5460 East).

The effect of the proposed infrastructure improvements (WoDWS) would not materially change the levels of future year traffic flows (No change in AM peak; +1.7% in PM peak). This result appears logical given that the proposed highway infrastructure would provide a bypass to the east of Hinkley and is unlikely to change the routing of the existing journeys at M1 junction 21.

The impact of the full development (WD) would be to change 2036 forecast total inflows at M69 junction 3/M1 junction 21 by (9,750-9,752=) -2PCU/hour (+0%) in the AM peak and by (9,897-9,666=) 231PCU/hour (+2%) in the PM peak.

The outputs from the Furness process at M69 junction 3/M1 junction 21 are reasonable.

M1 junction 20 / A4303 (at Lutterworth)

TA Table 7-1 Ref:
J25

Survey Jct Ref:
None

No junction turn matrices forecasts were produced in the “Furnessing Spreadsheet” for the M1 junction 20 at Lutterworth.

Any additional trips generated for the full development (WD) forecast scenario at this M1 junction 20 roundabout would likely also pass through the A5 ‘Cross in Hand’ junction. The magnitude of changes at the A5 junction should provide an indication of the changes forecast at M1 junction 20.

A5 / A444 ‘Redgate’ elongated roundabout

TA Table 7-1 Ref:
J32 & J33

Survey Jct Ref:
None

No junction turn matrices forecasts were produced in the “Furnessing Spreadsheet” for the A5 / A444 ‘Redgate’ elongated roundabout.

Any additional trips generated for the full development (WD) forecast scenario at this A5 / A444 ‘Redgate’ elongated roundabout would likely also pass through the A5 ‘Long Shoot’ junction. The magnitude of changes at this easterly A5 junction should provide an indication of the changes forecast at this A5 / A444 ‘Redgate’ junction.

A5 / A47 ‘The Long Shoot’ signal-controlled junction

TA Table 7-1 Ref:
J4

Survey Jct Ref:
26

PRTM node:
40491

		SURVEY FLOW					FUTURE YEAR FURNESSED TRAFFIC MATRICES															
Junction Arm		2023 Observed Flows					WoD 2036 FINAL MATIX				WoDWS 2036 FINAL MATIX				WD 2036 FINAL MATIX							
		A	B	C	TOTAL	A	B	C	TOTAL	A	B	C	TOTAL	A	B	C	TOTAL					
JA - A47 / A5 Longshoot	A	Watling Street E	A	0	665	737	1402	A	0	702	760	1462	A	0	689	766	1455	A	0	686	776	1462
	B	A47 The Long Shoot	B	695	0	94	789	B	667	0	85	752	B	666	0	84	750	B	667	0	87	754
	C	Watling Street W	C	669	37	0	706	C	815	45	0	860	C	823	43	0	866	C	832	42	0	874
	TOTAL		1364	702	831	2897	TOTAL	1482	747	845	3074	TOTAL	1489	732	850	3071	TOTAL	1499	728	863	3090	
		SURVEY FLOW					FUTURE YEAR FURNESSED TRAFFIC MATRICES															
Junction Arm		2023 Observed Flows					WoD 2036 FINAL MATIX				WoDWS 2036 FINAL MATIX				WD 2036 FINAL MATIX							
		A	B	C	TOTAL	A	B	C	TOTAL	A	B	C	TOTAL	A	B	C	TOTAL					
JA - A47 / A5 Longshoot	A	Watling Street E	A	0	736	752	1488	A	0	866	792	1658	A	0	877	798	1675	A	0	878	817	1695
	B	A47 The Long Shoot	B	628	0	78	706	B	639	0	76	715	B	653	0	77	730	B	650	0	75	725
	C	Watling Street W	C	644	53	0	697	C	668	60	0	728	C	685	61	0	746	C	702	59	0	761
	TOTAL		1272	789	830	2891	TOTAL	1307	926	868	3101	TOTAL	1338	938	875	3151	TOTAL	1352	937	892	3181	

In the AM peak hour, the total 2023 flows observed to arrive at the junction were 2,897PCU/hour in the 2023 AM peak. Without Development (WoD) trips, in 2036 the total AM peak flows arriving at the junction would be 3,074PCU/hour (+6%). All of this AM traffic growth is attributed to the SRN route, A5 Watling Street East (arm A) and A5 Watling Street West (arm C). The two-way AM peak flows on A47 ‘The Long Shoot’ would remain the same in 2036 as in 2023.

In the PM peak hour, the total 2023 flows observed to arrive at the junction were 2,891PCU/hour in the 2023 PM peak. Without Development (WoD) trips, in 2036 the total PM peak flows arriving at the junction would be 3,101PCU/hour (+7%). This PM traffic growth is attributed approximately equally to all three roads connected to the junction.

The effect of the proposed infrastructure improvements (WoDWS) would not materially change the levels of 2036 forecast year traffic flows at the A5 ‘Long Shoot’ traffic signal-controlled junction (0% in the AM peak hour and +1.6% in the PM peak hour).

The impact of the full development (WD) forecast scenario does not change the level of the 2036 forecast peak hour flows at the A5 ‘Long Shoot’ junction. This result implies that none of the trips generated by the proposed development would be to or from the local area around Nuneaton. This finding derives from the target flows generated by the PRTM strategic model’s forecasting scenarios rather than from the Furness process.

A5 / A47 / B4666 ‘Dodwells’ signalled roundabout

TA Table 7-1 Ref: **J14** | Survey Jct Ref: **25** | PRTM nodes: **76738, 76740, 76743, 76734**

AM Peak (PCU/Hour)		SURVEY FLOW		FUTURE YEAR FURNESSED TRAFFIC MATRICES																		
Junction Arm		2023 Observed Flows					WoD 2036 FINAL MATIX				WoDWS 2036 FINAL MATIX				WD 2036 FINAL MATIX							
J14 - A5 / B4666 / A47	A	Dodwells Road	A	B	C	D	TOTAL	A	B	C	D	TOTAL	A	B	C	D	TOTAL	A	B	C	D	TOTAL
	B	Coventry Road	0	75	184	452	711	0	102	269	477	848	0	81	216	431	728	0	84	220	447	751
	C	A5 Watling St SE	238	57	2	566	863	84	0	75	454	613	61	0	69	453	583	270	67	3	609	949
	D	A5 Watling St NW	414	346	596	0	1356	311	76	2	565	954	245	70	2	607	924	270	67	3	609	949
	TOTAL		711	478	835	1435	3459	431	372	674	0	1477	372	390	720	0	1482	408	365	728	0	1501
PM Peak (PCU/Hour)		2023 Observed Flows					WoD 2036 FINAL MATIX				WoDWS 2036 FINAL MATIX				WD 2036 FINAL MATIX							
J14 - A5 / B4666 / A47	A	Dodwells Road	A	B	C	D	TOTAL	A	B	C	D	TOTAL	A	B	C	D	TOTAL	A	B	C	D	TOTAL
	B	Coventry Road	0	106	206	471	783	0	121	218	392	731	0	101	191	385	677	0	110	183	393	686
	C	A5 Watling St SE	198	42	2	655	897	94	0	69	380	543	80	0	64	387	531	244	64	3	911	1209
	D	A5 Watling St NW	400	369	517	0	1286	277	70	3	873	1223	234	61	3	911	1209	244	64	3	937	1248
	TOTAL		686	517	781	1493	3477	347	428	556	0	1331	335	428	589	0	1352	361	429	575	0	1365

In the AM peak hour, the total 2023 flows observed to arrive at the junction were 3,459PCU/hour in the 2023 AM peak. Without Development (WoD) trips, in 2036 the total AM peak flows arriving at the junction would be 3,892PCU/hour (+13%). All of this AM traffic growth is attributed to the SRN route, A5 Watling Street Southeast (arm C) and A5 Watling Street Northwest (arm D). The two-way AM peak flows on the two minor roads (arm A and arm B) would remain the same in 2036 as in 2023.

In the PM peak hour, the total 2023 flows observed to arrive at the junction were 3,447PCU/hour in the 2023 PM peak. Without Development (WoD) trips, in 2036 the total PM peak flows arriving at the junction would be 3,828PCU/hour (+10%). This PM traffic growth is attributed to the SRN route, A5 Watling Street Southeast (arm C) and A5 Watling Street Northwest (arm D). The two-way PM peak flows on the two minor roads (arm A and arm B) would remain the same in 2036 as in 2023.

The effect of the proposed infrastructure improvements (WoDWS) would not materially change the levels of 2036 forecast year traffic inflows at the A5 'Dodwells' signalled roundabout (-4% in the AM peak hour and -2% in the PM peak hour). This is logical because the proposed highway infrastructure acts as an eastern bypass of Hinkley and would act to divert some longer-distance journeys away from A5 'Dodwells' junction and onto the M69.

The impact of the full development (WD) forecast scenario does not change the level of the 2036 forecast peak hour inflows at the A5 'Dodwells' junction. This finding derives from the target flows generated by the PRTM strategic model's forecasting scenarios rather than from the Furness process.

A5 / A4303 / B4027 'Cross In Hand' roundabout (at Magna Park)

TA Table 7-1 Ref:

Survey Jct Ref:

PRTM node:

J27

48

20628

AM Peak (PCU/Hour)		SURVEY FLOW						FUTURE YEAR FURNESSED TRAFFIC MATRICES																		
Junction Arm		2023 Observed Flows						WoD 2036 FINAL MATRIX					WoDWS 2036 FINAL MATRIX					WD 2036 FINAL MATRIX								
		A	B	C	D	E	TOTAL	A	B	C	D	E	TOTAL	A	B	C	D	E	TOTAL	A	B	C	D	E	TOTAL	
J27 - A5 / A4303 / B4027 / CoalPit Lane	A	A5 N	0	437	503	48	4	992	0	573	330	43	4	950	0	581	330	41	4	956	0	522	353	32	6	913
	B	A4303 E	332	0	226	223	76	857	622	0	217	311	112	1262	632	0	221	305	113	1271	661	0	239	310	106	1316
	C	A5 S	216	234	2	13	62	527	288	316	2	13	70	689	285	320	2	12	63	682	336	324	2	12	62	736
	D	B4027 S	40	154	19	0	1	214	122	455	29	0	2	608	116	453	27	0	2	598	120	464	31	0	2	617
	E	Coal Pit Lane W	20	149	80	6	0	255	37	272	72	19	0	400	34	267	69	19	0	389	42	322	85	20	0	469
TOTAL		608	974	830	290	143	2845	1069	1616	650	386	188	3909	1067	1621	649	377	182	3896	1159	1632	710	374	176	4051	
PM Peak (PCU/Hour)		SURVEY FLOW						FUTURE YEAR FURNESSED TRAFFIC MATRICES																		
Junction Arm		2023 Observed Flows						WoD 2036 FINAL MATRIX					WoDWS 2036 FINAL MATRIX					WD 2036 FINAL MATRIX								
		A	B	C	D	E	TOTAL	A	B	C	D	E	TOTAL	A	B	C	D	E	TOTAL	A	B	C	D	E	TOTAL	
J27 - A5 / A4303 / B4027 / CoalPit Lane	A	A5 N	0	262	337	26	4	629	0	539	372	102	7	1020	0	571	367	94	6	1038	0	578	403	123	7	1111
	B	A4303 E	405	0	236	128	130	899	623	0	209	382	247	1461	630	0	218	368	241	1457	626	0	191	379	240	1436
	C	A5 S	418	203	0	17	108	746	353	214	0	24	109	700	354	229	0	23	106	712	409	213	0	25	110	757
	D	B4027 S	74	277	3	0	7	361	87	370	2	0	10	469	72	336	2	0	12	422	88	349	2	0	12	451
	E	Coal Pit Lane W	5	79	43	1	0	128	6	107	36	2	0	151	6	101	32	2	0	141	6	101	34	3	0	144
TOTAL		902	821	619	172	249	2763	1069	1230	619	510	373	3801	1062	1237	619	487	365	3770	1129	1241	630	530	369	3899	

In the AM peak hour, the total 2023 flows observed to arrive at the junction were 2,845PCU/hour in the 2023 AM peak. Without Development (WoD) trips, in 2036 the total AM peak flows arriving at the junction would be 3,909PCU/hour (+38%). This AM traffic growth is attributed predominantly to the A4303 East (arm B), which provides access to the nearby Magna Park regional distribution warehouses.

In the PM peak hour, the total 2023 flows observed to arrive at the junction were 2,763PCU/hour in the 2023 PM peak. Without Development (WoD) trips, in 2036 the total PM peak flows arriving at the junction would be 3,801PCU/hour (+38%). This PM traffic growth is attributed predominantly to the A4303 East (arm B), which provides access to the nearby Magna Park regional distribution warehouses.

The effect of the proposed infrastructure improvements (WoDWS) would not materially change the levels of 2036 forecast year traffic inflows at the A5 'Cross In Hand' roundabout (-0% in the AM peak hour and -1% in the PM peak hour). This is logical because the proposed highway infrastructure acts as an eastern bypass of Hinkley and would not change existing journeys passing through the A5 'Cross in Hand' roundabout.

The impact of the full development (WD) forecast scenario does not materially increase the level of the 2036 forecast peak hour inflows at the A5 'Cross In Hand' junction (+4% AM peak hour inflows; +3% PM peak hour inflows).

This finding derives from the target flows generated by the PRTM strategic model's forecasting scenarios rather than from the Furness process.

It is noted that the PRTM could be modelling new freight trips between the existing Magna Park regional distribution centre and the Applicant's Hinkley NRFI site. If this was the case, then the Furness processing method would redistribute these large 2036 HGV turn movements between A5 North (arm A) and A4303 East (arm B) and in the WD scenario could underestimate the HGV flows between arm A and arm B.

A5 / A426 / Gibbet Lane, 'Gibbet' roundabout

		TA Table 7-1 Ref:	Survey Jct Ref:	PRTM node:	
		J26	47	20780	
AM Peak (PCU/Hour)		SURVEY FLOW	FUTURE YEAR FURNESSED TRAFFIC MATRICES		
Junction Arm		2023 Observed Flows	WoD 2036 FINAL MATIX	WoDWS 2036 FINAL MATIX	WD 2036 FINAL MATIX
GIBBET ROUNDABOUT	A Watling Street N	A 0 5 32 353 452 842	A 0 1 32 245 382 660	A 0 1 34 250 377 662	A 0 1 40 287 392 720
	B Rugby Road	B 2 0 25 139 547 713	B 1 0 30 101 506 638	B 1 0 30 103 505 639	B 1 0 31 105 509 644
	C Gibbet Lane	C 20 23 1 5 57 106	C 46 36 6 10 267 365	C 46 36 5 10 266 363	C 53 35 6 12 272 378
	D Watling Street S	D 328 219 32 5 193 777	D 463 118 87 6 433 1107	D 462 117 87 6 436 1108	D 495 106 85 10 419 1115
	E Rugby Road W	E 189 215 19 100 0 523	E 191 138 33 126 0 488	E 186 133 29 124 0 472	E 199 120 28 122 0 469
	TOTAL	TOTAL 539 462 109 602 1249 2961	TOTAL 701 293 188 488 1588 3258	TOTAL 695 287 185 493 1584 3244	TOTAL 748 262 190 536 1592 3328
PM Peak (PCU/Hour)		SURVEY FLOW	FUTURE YEAR FURNESSED TRAFFIC MATRICES		
Junction Arm		2023 Observed Flows	WoD 2036 FINAL MATIX	WoDWS 2036 FINAL MATIX	WD 2036 FINAL MATIX
GIBBET ROUNDABOUT	A Watling Street N	A 0 5 25 230 362 622	A 0 3 15 246 359 623	A 0 4 15 250 353 622	A 0 4 15 275 339 633
	B Rugby Road	B 1 0 16 163 450 630	B 1 0 17 220 549 787	B 1 0 14 225 548 788	B 1 0 16 254 527 798
	C Gibbet Lane	C 20 19 0 13 46 98	C 22 20 0 33 93 168	C 21 21 0 31 91 164	C 22 24 0 35 96 177
	D Watling Street S	D 432 125 23 7 134 721	D 469 220 49 15 335 1088	D 481 217 42 15 327 1082	D 524 230 47 17 308 1126
	E Rugby Road W	E 290 468 14 111 4 887	E 207 485 13 166 4 875	E 206 471 13 156 4 850	E 206 496 14 155 4 875
	TOTAL	TOTAL 743 617 78 524 996 2958	TOTAL 699 728 94 680 1340 3541	TOTAL 709 713 84 677 1323 3506	TOTAL 753 754 92 736 1274 3609

In the AM peak hour, the total 2023 flows observed to arrive at the junction were 2,961PCU/hour in the 2023 AM peak. Without Development (WoD) trips, in 2036 the total AM peak flows arriving at the junction would be 3,258PCU/hour (+10%). This AM traffic growth is attributed predominantly to the traffic approaching from A5 Watling Street South arm D (+42%) and turning to A426 Rugby Road West arm E (+27%). This bias in directional traffic growth derives from the target flows obtained from the PRTM traffic forecasting scenarios.

In the PM peak hour, the total 2023 flows observed to arrive at the junction were 2,958PCU/hour in the 2023 PM peak. Without Development (WoD) trips, in 2036 the total PM peak flows arriving at the junction would be 3,541PCU/hour (+20%). This PM traffic growth is attributed predominantly to the traffic approaching from A5 Watling Street South arm D (+51%) and turning to A426 Rugby Road West arm E (+35%). This bias in directional traffic growth derives from the target flows obtained from the PRTM traffic forecasting scenarios.

The effect of the proposed infrastructure improvements (WoDWS) would not materially change the levels of 2036 forecast year traffic inflows at the A5 'Gibbet' roundabout (-0% in the AM peak hour and -1% in the PM peak hour). This is logical because the proposed highway infrastructure acts as an eastern bypass of Hinkley and would not change existing journeys passing through the A5 'Gibbet' roundabout.

The impact of the full development (WD) forecast scenario does not materially increase the level of the 2036 forecast peak hour inflows at the A5 'Gibbet' roundabout (+2% AM peak hour inflows; +2% PM peak hour inflows).

Because of the bias observed in the directional flows, the operational performance of the A5 'Gibbet' roundabout should be tested with a proportion of the left turn flows, from arm D (A5 Watling Street South) to arm E (A426 Southwest), transferred to an alternative exit arm.

4. Summary Of Comments

1. The Applicant has not responded to National Highway's comments as set out in the DCO document **REP1-182**.
2. No junction turn matrices forecasts were produced in the "Furnessing Spreadsheet" at the M1 junction 20 two-bridge roundabout nor at the A5 'Redgate' elongated roundabout.
3. The "Furness spreadsheet" does not document the grade separated flows at M69 junction 1 and at M69 junction 2. This means that the turning movement matrices cannot be used to assess the future operation efficiency of the M69 slip road merge areas.
4. The Furnessing process could underestimate the magnitude of the HGV turn movements between A5 North and A4303 East at the A5 'Cross In Hand' roundabout if new HGV trips are induced between the Applicant's Hinkley NRFI site and the existing Magna Park regional distribution centre.
5. Directional traffic growth biases in the target flows were noted at the A5 'Gibbet' roundabout. The operational performance of this roundabout should be assessed with alternative turning movement proportions applied to check that these biases are not material to the operational performance of the roundabout.