

Tritax Symmetry (Hinckley) Limited

**HINCKLEY NATIONAL  
RAIL FREIGHT INTERCHANGE**

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**The Hinckley National Rail Freight Interchange  
Development Consent Order**

Project reference TR050007

**Appendix 12 - M69 J2 Modelling Note**

Revision: 01

**December 2024**

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Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009  
Regulation 5(2)(q)

<b>PROJECT NAME</b>	<b>Hinckley National Rail Freight Interchange</b>		
<b>DOCUMENT NUMBER</b>	HNRFI-BWB-GEN-XX-RP-TR-0044	<b>BWB REF</b>	NTT2814
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## 1. INTRODUCTION

1.1 The M69 Junction 2 VISSIM model was submitted to both Leicestershire County Council (LCC) and National Highways (NH) during the DCO process. Following this, the Secretary of State (SoS) letter was received 10th September 2024 which states the following with regards to traffic modelling:

- *The Secretary of State notes that both NH and LCC raised concerns around the Applicant's modelling of M69 J2 (Junction 20) and the additional arm to the roundabout. NH highlighted that the furnishing applied at the junction was incorrect as it has effectively resulted in the double discounting of trips in the 2036 with Development model, resulting in an under-estimation of traffic flows at the junction and the impact on the Strategic Road Network ("SRN") [ER 3.3.277 & 3.3.450].*
- *LCC also raised a number of concerns, including that the VISSIM model for the junction needs to be updated due to the potential impacts on traffic flows both on and off the circulatory of the M69 J2 due to the Pegasus crossing proposed at the access road into the site and the lack of safe crossings of the M69 J2 slip roads by pedestrians/ cyclists [ER 3.3.312].*
- *The ExA reported that it was not clear whether the modelling took into account the extended crossing times for equestrians which may occur due to the Pegasus crossing and was of the view that there is insufficient information in front of the Examination to show that the modelling of the junction has been robustly considered. It further considered that this issue should not be left to the detailed design stage [ER 3.3.457 – 3.3.458].*

1.2 Discussions have continued to address the issues that had not been fully agreed at the end of examination period with NH in terms of Furnishing and the VISSIM Model.

1.3 The VISSIM Model was completed prior to the end of examination, which did include the Pegasus crossing as per the request from LCC . However the review and audit process needed to be completed.

1.4 Subsequently, NH and their consultant team have continued with the audit process on the M69 Junction 2 VISSIM modelling, this report provides a summary of the forecast traffic flow methodology (furnishing), modelling outputs and any changes made to the model during the NH audit process to address SoS concerns, including the addition of the Pegasus Crossing on the A47 Link Road

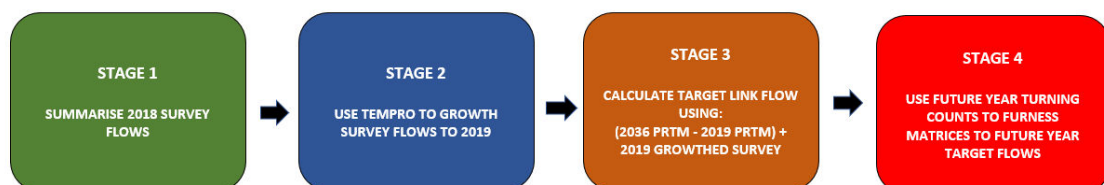
## 2. FURNESSING

- 2.1 Comments were received from NH with regards to the furnessing methodology undertaken at M69 J2 particularly querying the application the furnessing methodology, an extract of the comment is provided below.

*“We note that the impact of the Development (site + schemes) has been calculated by the Applicant from the PRTM forecast outputs as WD 2036 – WoD 2036. On several of the turn movements the impact of the Development has been to reduce the turn flows, i.e. negative traffic growth. For example, on the M69 mainline (between arms A and C) and between the Hinckley Rd E and W roads (between arms B and D).”*

*The Applicant has then applied these development impacts (both positive and negative) to the 2023 Observed flows (i.e. “growth between PRTM 2019 and 2036 has been directly added onto the 2023 survey flows”). However, trips that the PRTM has removed from its 2036 WoD forecast year matrix for the 2036 with development (WD) case, cannot be subtracted from the 2023 Observed turn flows matrix if those trips were not observed to be using the roundabout in 2023. (i.e. trips that do not exist should not be subtracted). Further to the above, this report also addresses NH queries with regards to furnessing undertaken at M69 J2.”*

- 2.2 As detailed in technical note HNRFI-BWB-GEN-XX-RP-TR-0022-S4-P04\_Furnessing Methodology the furnessing methodology undertaken for off-site junctions utilises the observed turning movements in combination with calculated forecast link flows to furness future year flow matrices. However, it was considered that this approach is not applicable to M69 Junction 2 as three additional arms are added to the junction and as these do not have any base flows, furnessing cannot be undertaken.
- 2.3 The proposed scheme will significantly alter the movement at the junction with rerouting of traffic through the junction, therefore it was proposed that a different approach for ‘Stage 4’ of furnessing is taken only for the site access junctions. Instead of using observed turning count proportions to furness the matrices, the PRTM turning counts for the respective future year scenarios as a prior matrix was utilised to furness the matrices. This methodology utilises observed counts to calculate a more realistic link flow target at the junction whilst accounting for the redistribution of traffic anticipated at M69 J2 with the inclusion of new arms to the junction. The methodology has been presented in the diagram below.



- 2.4 The furnessing methodology proposed for the site access junction including M69 Junction 2 had been agreed with both NH/LCC prior to undertaking any modelling of the junctions. This has been applied correctly in accordance with the agreed approach.

2.5 NH also queried the application of both ‘positive’ and ‘negative’ development impact and requested the exclusion of the negative growth from 2019 to 2036. However, the difference plots between WD and WoD scenarios provided by AECOM (on behalf of LCC NDI) clearly indicates that the introduction of the new south facing slip roads and provision of the A47 link road results in redistribution of traffic.

2.6 The plots indicated:

- Traffic that formerly routed from Leicester Road via Hinckley Road W towards Hinckley Road E now is able to utilise the A47 link road to route towards Hinckley Road W. This is represented in the flows by a reduction in flows between Hinckley Road W to Hinckley Road E and an increase in flows between the new A47 link road and Hinckley Road E.
- Traffic that formerly routed from Hinckley Road E towards A5 no longer needs to travel via Hinckley Road W, the provision of the south facing slip roads allow traffic to utilise the M69 to access onto the A5.
- The introduction of the south facing slip roads also allow traffic from M69 NB that previously had to travel through M1 J21 to access local villages are now able to egress of M69 J2 allowing a more direct route.

2.7 Furthermore, during NH auditing process, it was requested that an alternative method of deriving forecast matrices is explored. This included the increase/decrease predicted from PRTM 2019 to PRTM 2036 added to the observed flows at a turning count level. A comparison of between methodologies was undertaken and it was concluded that at most the difference in flows equated to approximately 60 vehicles which would equate to one additional vehicle per cycle at the junction. Based on this, it was considered and agreed that original furnished flows would be acceptable for the assessment.

### 3. National Highways VISSIM Model Audit

3.1 During the NH auditing process some queries were raised with regards to the VISSIM model. These are presented in the Table below alongside the response to each query.

**Table 1: NH Audit Comments**

Issue	BWB Response
Overlap on B4669 WB Exit	- Extended link 69 to shorten connector 10018
	- added priority rule 57
Overlap on M1 NB approach to circulatory	- Extended Link 104 to shorten connectors 10125,10126,10161
	- Extended PR 51 headway
	- Added PR 59
Flare coding on B4669 E overestimates capacity	-Design will be amended during detailed design to reflect flare usage in VISSIM model

3.2 Furthermore, due to the requirement for an acoustic barrier west of the proposed A47 link road roundabout, the A47 link was moved approximately 7m to the west. However, it should be noted that this does not affect the number of lanes or stacking capacity provided. NH's consultants confirmed and agreed that this would not have any material

impact on the VISSIM modelling. A comparison of the original A47 link alignment (black) and new alignment (magenta) is shown in Figure 1.

**Figure 1: A47 Link Road Alignment Comparison**



#### **4. M69 Junction 2 VISSIM Pegasus Crossing Analysis**

- 4.1 LCC requested the rerun of the VISSIM model inclusive of the Pegasus crossing west of M69 J2. To provide a worst-case assessment, this has been modelled as a fixed time signal with the Pegasus crossing along the A47 link road called once every minute. An intergreen of 17 seconds has been accounted between crossing phase and traffic phase which accommodates a typical horse walking speed.
- 4.2 A copy of the drawing has been provided in **Appendix 1**.

#### **Network Performance**

- 4.3 A comparison of the network performance has been presented in **Table 2** and **3**.

**Table 2: M69 J2 Network Performance AM**

		Avg Delay	Avg Speed	Veh Arrived	Latent Demand
0730-0830	2036 WoD	8	58	7381	0
	2036 WD	41	46	10456	0
0830-0930	2036 WoD	6	59	6009	0
	2036 WD	28	49	8475	0

**Table 3: M69 J2 Network Performance PM**

		Avg Delay	Avg Speed	Veh Arrived	Latent Demand
1630-1730	2036 WoD	7	59	6254	0
	2036 WD	38	46	8466	0
1730-1830	2036 WoD	7	59	6079	1
	2036 WD	32	48	7878	0

- 4.4 A review of the network performance between 'WoD' and 'WD' scenarios indicates that there is an increase in network performance across all 'WD' scenarios. The junction currently is a three-arm priority-controlled roundabout which is proposed to form a 5-arm signalised roundabout. Signalisation of entry arms generally add delay to journey times however a review of the network performance indicates that the junction is able to accommodate more than 1,800 additional vehicles per peak hour whilst operating satisfactorily. Therefore, it is considered no further refinements to the design is required.
- 4.5 **Table 2** and **3** indicate that the inclusion of the Pegasus crossing has minimal impact on the operation of the junction. Furthermore, a review of the VISSIM simulation indicates that the queues do not block back onto M69 J2 and continues to operate satisfactorily as previously concluded by BWB.

### Journey Times & Queue Results

- 4.6 A summary of the journey times to the approach arms of the roundabout is presented in **Table 4**.

**Table 4: Journey Time Summary (s)**

		2036 WoD		2036 WD	
		AM	PM	AM	PM
0730-0830	M69 SB Off Slip	21	22	86	90
	B4669 E	67	65	112	92

	M69 NB Off Slip	-	-	59	55
	B4669 W	26	24	70	100
	A47 Link Road	-	-	53	51
0830-0930 / 1730-1830	M69 SB Off Slip	21	21	63	76
	B4669 E	66	65	88	89
	M69 NB Off Slip	-	-	45	51
	B4669 W	25	24	63	87
	A47 Link Road	-	-	43	48

- 4.7 **Tables 4** shows that there is a general increase in journey times on all approaches of M69 J2 which is to be expected as signalisation of the roundabout will naturally add delay to the junction. However as indicated in the network performance review the junction is now able to cater for more than 1,800 additional vehicles per peak hour whilst operating satisfactorily therefore provides a significant improvement to the junction.
- 4.8 A summary of the average queues and maximum queues and proximity to nearby junctions is presented in **Table 5** and **6** below.

**Table 5: Average Queue Summary (PCU)**

		Distance to Nearby Junction/Diverge	2036 WoD		2036 WD	
			AM	PM	AM	PM
0730-0830 / 1630-1730	M69 SB Off Slip	81	0	0	6	6
	B4669 E	226	0	0	6	0
	B4669 W	70	0	0	2	4
	M69 NB Off Slip	73	-	-	11	12
	A47 Link Road	83	-	-	17	12
0830-0930 / 1730-1830	M69 SB Off Slip	81	0	0	3	4
	B4669 E	226	0	0	0	0
	B4669 W	70	0	0	1	2
	M69 NB Off Slip	73	-	-	5	10
	A47 Link Road	83	-	-	4	7

**Table 6: Maximum Queue Summary (PCU)**

		Distance to Nearby Junction/Diverge	2036 WoD		2036 WD	
			AM	PM	AM	PM
0730-0830 / 1630-1730	M69 SB Off Slip	81	2	3	24	21
	B4669 E	226	3	2	67	4
	B4669 W	70	4	1	12	18
	M69 NB Off Slip	73	-	-	55	51
	A47 Link Road	83	-	-	71	59
	M69 SB Off Slip	81	1	2	11	15

0830-0930 / 1730-1830	B4669 E	226	2	2	7	3
	B4669 W	70	2	0	9	13
	M69 NB Off Slip	73	-	-	24	53
	A47 Link Road	83	-	-	32	48

4.9 **Tables 5** and **6** indicates that the 2036 WD maximum queues do not have an impact on nearby junctions or M69 mainline carriageway.

## 5. SUMMARY & CONCLUSION

5.1 Following the DCO hearing, SoS requested further information on the below to address LCC and NH concerns. These included the following:

- Traffic Flow furnessing methodology;
- Inclusion of Pegasus crossing along A47 link road;
- Crossing times accounted for in the VISSIM modelling.

5.2 NH and their consultants continued with the audit the M69 Junction 2 modelling and during this process.

5.3 The furnessing methodology utilised was examined further. An alternative approach was suggested by NH to apply growth observed between PRTM base and forecast models directly to the turning movements and subsequently provide a comparison between this method and the proposed furnessing methodology was undertaken. This indicated that at most the individual turning movements were different by 60 vehicles which equates to approximately 1 additional vehicle per cycle therefore it was considered the original furnessing methodology would be acceptable for modelling the impact of the proposed scheme.

5.4 The Pegasus crossing has been included in the VISSIM model. This has been coded to call once every minute with an intergreen of 17 seconds between crossing phase to traffic phase, this provides a worst-case assessment.

5.5 NH audited the M69 J2 VISSIM model and following the changes requested as detailed within this report, it was considered the VISSIM model was acceptable to NH's consultants.

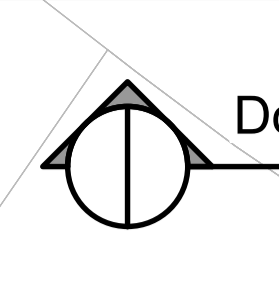


**APPENDIX 1**





Document 2.4A Sheet 1



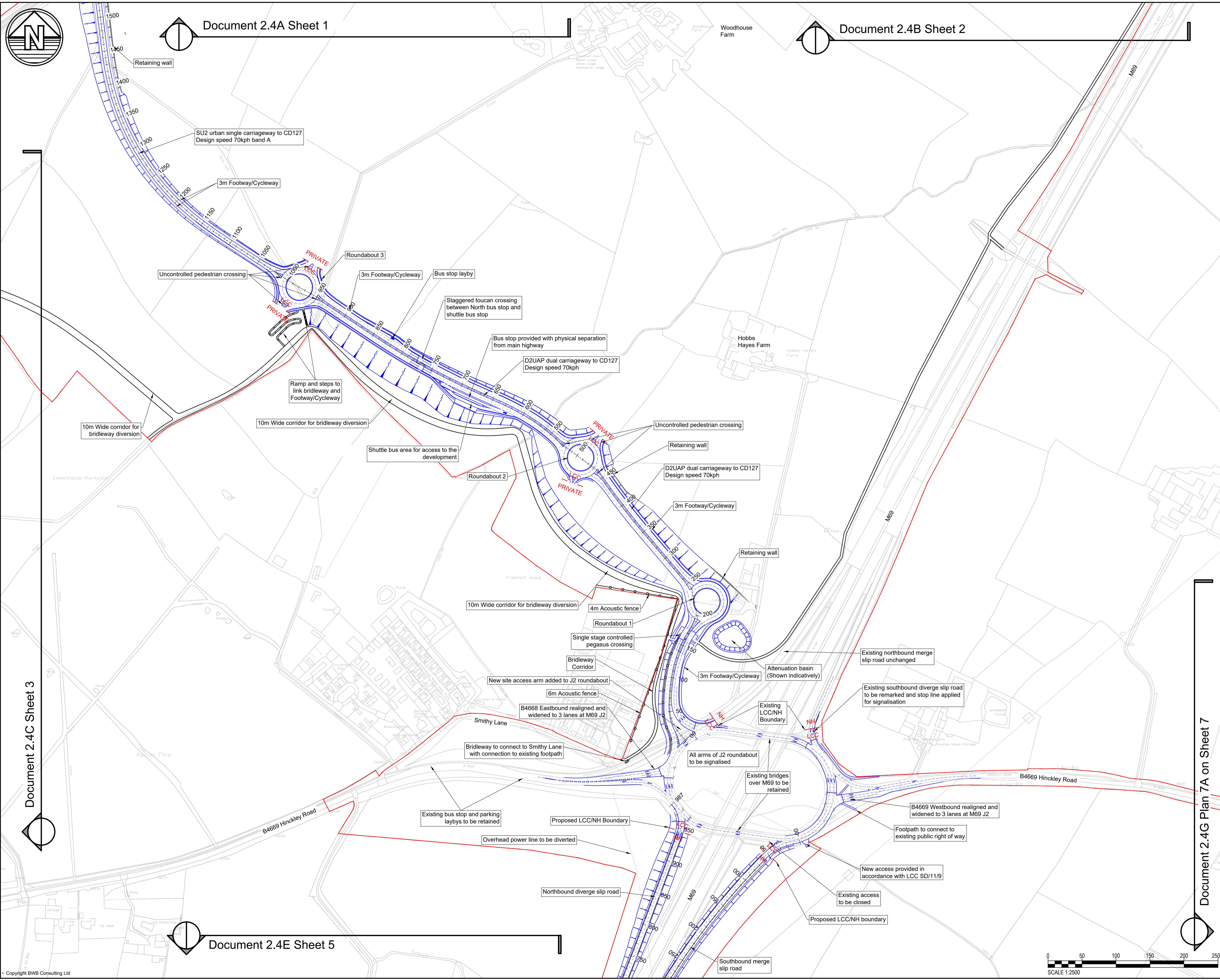
Document 2.4B Sheet 2

**Note**  
The purpose of the Highway Plans is to illustrate highway mitigation works proposed in relation to the Hinckley National Rail Freight Interchange.

**Legend**

- ORDER LIMITS
- ALL BLUE MARKINGS DENOTES HIGHWAY WORKS
- ALL GREEN MARKINGS DENOTES COMMITTED HIGHWAY WORKS BY OTHERS
- ACOUSTIC FENCE - FOR DETAILS REFER TO ENVIRONMENTAL STATEMENT - NOISE & VIBRATION: CHAPTER 10 REF 6.1.10

THE LEGEND IS IDENTICAL ON ALL SHEETS OF THE HIGHWAY PLANS AND THEREFORE NOT ALL ITEMS DETAILED IN THE LEGEND ARE REPRESENTED ON EACH SHEET



Document 2.4C Sheet 3



Document 2.4E Sheet 5

Document 2.4G Plan 7A on Sheet 7

Rev	Date	Details of issue / revision	Drw	Chd
P03	04.01.23	Legend amended	DF	SC
P02	30.11.22	Final Issue	DF	SC
P01	16.12.21	Issue for Consultation	DF	SC

**Issues & Revisions**

Client

A TRITAX BIG BOX COMPANY

Project Title  
**HINCKLEY NATIONAL RAIL FREIGHT INTERCHANGE**

Drawing Title  
**HIGHWAY PLANS SHEET 4 OF 8**

Regulation:	5(2) (o)	Document:	2.4D
Drawn:	D. Fraser	Checked:	S. Carter
BWB Ref:	NTT 2814	Date:	17.12.21
Project - Originator - Functional Breakdown - Spatial Breakdown - Form - Discipline - Number <b>HRF-BWB-LSI-D4-DR-CH-00100</b>			
Drawing Status	<b>S4 - FINAL</b>		Rev <b>P03</b>

