Tritax Symmetry (Hinckley) Limited

HINCKLEY NATIONAL RAIL FREIGHT INTERCHANGE

The Hinckley National Rail Freight Interchange Development Consent Order

Project reference TR050007

Environmental Statement Volume 2: Appendices

Appendix 8.1: Transport Assessment [part 4 of 20] Trip Generation Addendum

Document reference: 6.2.8.1

Revision: 05

November 2022

Planning Act 2008

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

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 Regulation 14

This document forms a part of the Environmental Statement for the Hinckley National Rail Freight Interchange project.

Tritax Symmetry (Hinckley) Limited (TSH) has applied to the Secretary of State for Transport for a Development Consent Order (DCO) for the Hinckley National Rail Freight Interchange (HNRFI).

To help inform the determination of the DCO application, TSH has undertaken an environmental impact assessment (EIA) of its proposals. EIA is a process that aims to improve the environmental design of a development proposal, and to provide the decision maker with sufficient information about the environmental effects of the project to make a decision.

The findings of an EIA are described in a written report known as an Environmental Statement (ES). An ES provides environmental information about the scheme, including a description of the development, its predicted environmental effects and the measures proposed to ameliorate any adverse effects.

Further details about the proposed Hinckley National Rail Freight Interchange are available on the project website:

[redacted]

The DCO application and documents relating to the examination of the proposed development can be viewed on the Planning Inspectorate's National Infrastructure Planning website:

https://infrastructure.planninginspectorate.gov.uk/projects/east-midlands/hinckley-national-rail-freight-interchange/

TRANSPORT TECHNICAL NOTE

Hinckley NRFI

PROJECT NAME	**Hinckley NRFI**		
DOCUMENT NUMBER	HNRFI-BWB-GEN-XX-RP-TR-0011-S4-P04_Trip Generation Addendum	BWB REF	NTT 2814
AUTHOR	Malcolm Ash	STATUS	S4
CHECKED	Shirley Dumigan	REVISION	P04
APPROVED	Shirley Dumigan	DATE	04/10/2021

1. INTRODUCTION

1.1 This addendum provides a short update to the Hydrock Document; TR004 A-E Trip Generation Report and Supporting Evidence (which forms **Appendix A**). Which had written acceptance from HE and LCC dating back to 22.11.18.

1.2 A commentary of the suitability of the generation report is provided in the BWB Hydrock Document Review HNRFI-BWB-GEN-XX-RP-TP-0007-S4-P01 (which forms **Appendix C**) which was issued to the Transport Working Group on 17.02.21.

1.3 This addendum has been produced for the following reasons:

- an update to the total train paths accessing the site;
- amendments of the external to internal HGV movement ratio; and
- benchmarking against existing SRFI sites which have been through the DCO process.

1.4 The site remains as 850,000 sqm of B8 use with the derivation of trip rates from other approved rail freight applications as per the original note.

1.5 This addendum addresses specific changes to the rail freight movements at the Terminal and impacts on HGV figures. It does not fundamentally change the derivation of the trip rates for the B8 elements for both HGVs and associated light vehicles. As with other Rail Freight applications across the Midlands, the rates are derived from applications at several different sites with extant permissions in place and surveys at DIRFT (Daventry International Rail Freight Terminal) in 2016 and Swan Valley B8 park (for Light vehicles). This has provided an average rate as outlined in the original note.

1.6 Since the Trip Generation Report a change to the number of train paths have required an adjustment to the maximum paths projected to serve the Hinckley site, this has risen from 12 to 16 trains weekdays, with 4 trains on Saturday expected to stay the same.

1.7 The ratio of external HGV movements to internal has been adjusted from a previous ratio of 60/40 and based on similar numbers for Northampton Gateway and West Midlands Interchange, feedback from potential operators and Network Rail. A revised external/internal split of HGV movements has been set at 70/30 which aligns with similar open access Terminal sites in the Midlands. The updated HGV trip generation is included with this note.

1.8 The note sets out the assumptions provided by the specialist rail logistics team and the impact on the overall peak hour and daily trip HGV generation.

2. RAIL FREIGHT TERMINAL ADJUSTMENTS AND MOVEMENTS

2.1 Baker Rose has provided a revised set of modelled figures deriving HGV movements from train paths, level of utilisation, numbers of containers assumed, movements per container and the ratio of external movements from the site.

2.2 The Baker Rose derivation calculations and a further clarification note (HNRFI-BWB-GEN-XX-RP-TP-0021-S2-P01) produced by BWB and Baker Rose which was in response to some queries raised by Highways England on the derivation and issued to the TWG on the 03.06.21, that derivation was also presented in a previous version of this addendum. Both the derivation and the calcification note can be found in **Appendix B**).

2.3 A further note on the origins of the assumptions, used within this document can be found in **Appendix D**. Sections 6, 7 and 9 present the rationale behind TEU to Container Numbers, external/internal ratio and number of movements per container respectively.

2.4 Further feedback from Hinckley and Bosworth Borough Council-HBBC (20/09/21) on the note in Appendix D led to an additional clarification from Baker Rose (rail consultants) which is contained in **Appendix E**. This, and the original note were subsequently accepted by HBBC on the 22/09/21

2.5 The key factors for the road freight derivations are:

- Standard utilisation percentage of train = 81%
- Factor for Twenty Foot Equivalent Unit (TEU) to Container Numbers (typically Forty foot) = 1.8
- Number of Movements per Container = 1.35
- Ratio External: Internal = 70:30.

2.6 The total movements off site have been calculated based on the container numbers and the maximum 16 paths per weekday which provides a total of 1,944 two-way HGV movements per weekday and 4 trains paths per weekend day (Saturday) providing 486 two-way HGV movements per day.

2.7 Tables 5.2, 5.3, 5.5 and 5.6 from the original Hydrock Trip Generation Report have subsequently been replaced by **Table 1, Table 2, Table 3 and Table 4** shown below with the updated figures following the changes described above.

2.8 Table 5.5 from the original Hydrock report including the number of HGV movements per weekdays and weekend days is being replaced by **Table 1**, overleaf.

Table 1: Rail Terminal HGV Movements per Day

HGV Movements per Day	One-way trips	Two-way trips
Number of trains per weekday	16	
Number of containers per weekday	720	1,440
Number of HGV movements per weekday	**972**	**1,944**
Number of trains per weekend day	4	
Number of containers per weekend day	180	360
Number of HGV movements per weekend day	**243**	**486**

2.9 Table 5.3 from the original Hydrock report showing annual number of movements is being replaced by **Table 2** below.

Table 2: Rail Terminal HGV Movements per Annum

HGV Movements per Day	One-way trips	Two-way trips
Weekday operating days per annum	260	
Weekend operating days per annum	104	
Number of HGV movements per annum	**277,992**	**555,984**

2.10 The daily HGV weekday hourly profile set out in the original trip generation note, which is based on Hams Hall daily profile that are set out in Tables 5.4 and Figure 5.2 and the likely staff numbers and generation in the Trip Generation Report remain valid. However, the resultant daily profile and trip generation have been revised with the two-way HGV movements per day as shown in **Table 4** and **Table 5** which now supersede Table 5.5 and Table 5.6 from the original note.

Table 3: Hinckley Rail terminal HGV Movements per Hour (Two-Way)

Hour	**00:00**	**01:00**	**02:00**	**03:00**	**04:00**	**05:00**	**06:00**	**07:00**
HGV Trips	4	8	8	6	16	51	117	156
Hour	**08:00**	**09:00**	**10:00**	**11:00**	**12:00**	**13:00**	**14:00**	**15:00**
HGV Trips	101	99	138	130	173	140	99	138
Hour	**16:00**	**17:00**	**18:00**	**19:00**	**20:00**	**21:00**	**22:00**	**23:00**
HGV Trips	156	142	132	80	31	14	6	4

Table 4: Hinckley Rail Terminal Total Trip Generation (Maximum)

Vehicle Type	AM Peak (08:00-09:00)			PM Peak (17:00-18:00)			Daily (24 hours)		
	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total
Light Vehicles	0	0	0	0	0	0	56	56	112
HGVs	51	50	101	71	71	142	972	972	1944
Total	**51**	**50**	**101**	**71**	**71**	**142**	**1028**	**1028**	**2056**

2.11 As the original B8 trip rates have been derived from sites with Rail Freight facilities, no further discounting of HGVs has been applied. Normally discounting would be applicable if comparing with a road only B8 facility. This is because there are many primary movements removed from the local network due to freight coming into the facility via rail over a standalone B8 facility, known as the primary movement.

2.12 The resultant internal and external movements have been updated to allow for the revised train path numbers and internal/external split (30/70) provided by Baker Rose as detailed above and shown in **Table 5** overleaf, which replaces Table 6.2 from the original Hydrock report.

Table 5: Hinckley Rail Terminal HGV Internal/External Movements (Maximum)

Movements	AM Peak (08:00-09:00)			PM Peak (17:00-18:00)			Daily (24 hours)		
	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total
Internal (30%)	15	15	30	21	21	43	292	292	583
External (70%)	36	35	71	50	50	99	680	680	1361
Total	**51**	**50**	**101**	**71**	**71**	**142**	**972**	**972**	**1944**
% of the Daily Profile	5.20%			7.30%			100%		

2.13 The resultant changes to the external HGV movements as a result of the updated Train paths from 12 (Referenced in the Trip Generation Note) to 16 proposed and the External/Internal split updated from 60/40 to 70/30 is provided in **Table 6** for ease of reference.

Table 6: Comparison of the Previous and Newly Proposed Hinckley Rail Terminal External HGV Movements

	AM Peak (08:00-09:00)			PM Peak (17:00-18:00)			Daily (24 hours)		
	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total
Previous 12 train paths and 60/40	26	26	52	37	37	74	504	504	1008
Now proposed 16 train paths and 70/30	36	35	71	50	50	99	680	680	1361
Additional HGV trips now proposed	**10**	**9**	**19**	**13**	**13**	**26**	**176**	**176**	**353**

2.14 Finally, the total external trip generation for the B8 Warehousing and Rail Terminal has been recalculated and the revised total trip generation is presented in **Table 7** below which now supersede Table 9.1 from the original Trip Generation report.

Table 7: Hinckley NRFI Combined Total External Trip Generation (B8 Warehousing 850,000sqm and Rail Freight Terminal)

Vehicle Type	AM Peak (08:00-09:00)			PM Peak (17:00-18:00)			Daily (24 hours)		
	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total
Light Vehicles	899	117	1,016	351	922	1,273	8,274	8,164	16,438
HGVs	208	219	427	235	259	494	4,498	4,500	8,998
Total	**1,107**	**336**	**1,443**	**586**	**1,181**	**1,767**	**12,772**	**12,664**	**25,435**

3. EXTANT RAIL FREIGHT FACILITY PERMISSIONS MIDLANDS

3.1 The original note listed 5 specific SRFI locations in the Midlands as comparator sites. At the time of writing only DIRFT II had been constructed and surveys from 2016 were referenced back to its usage in the most recent DCO application for the West Midlands Interchange.

3.2 One site was withdrawn from DCO submission; Rail Central, located close to the Northampton Gateway site.

3.3 **Table 8** highlights existing SRFI sites in the Midlands, their application and permission dates and current status. Of the five sites, only DIRFT I & II is complete and operational, DIRFT III has one unit constructed, West Midlands and Northampton Gateway have approval and are under construction, East Midlands gateway has five units completed, whilst three remain under construction with two still at the planning stage.

3.4 The comparison site data used in the 2018 trip generation note reviewed the trip rates used for these sites in the DCO process while comparing with directly observed rates at DIRFT I & II. As progress below shows, the DIRFT surveys remain the most valid observable information on rail enabled sites available at this time for the B8 trip generation element.

Table 8: Midlands SRFI Sites DCO Dates and Current Status

Site	DCO Application Date	Permission Granted	Progress to Date	Trip Generation Notes
Daventry International Rail Freight Terminal (DIRFT III)	22/02/2013	03/07/2014	Partially built	Based on DIRFT I &II surveys 2011.
West Midlands Interchange	Aug 2018	04/05/2020	Preparation for Construction	Based on DIRFT I &II surveys undertaken in 2016
East Midlands Gateway	Sep 2014	12/01/2016	5 units complete, 3 under construction and 2 at planning stage	Swan Valley 2007
Northampton Gateway	May 2018	09/10/2019	Under construction	Swan Valley surveys 2007

4. SUMMARY

4.1 This note provides an update and addendum to the original trip generation note produced by Hydrock in November 2018.

4.2 The site remains a total of 850,000 sqm of primarily B8 land use and the mix of sites used as comparators are in line with other approved rail freight interchange sites, including Northampton Gateway and West Midlands Interchange.

4.3 Further negotiations between the client team, Network Rail and potential terminal operators has required the revision of the maximum number of train paths into the site. This has increased from 12 to 16 paths on a weekday and remaining at 4 on Saturday. This has triggered the need for this addendum note examining of the impacts on HGV numbers projected to leave the Hinckley site.

4.4 The updates have been derived from average utilisation rates and common factors for container movements both internal to a rail freight interchange and external to the highway network. These have been obtained from rail freight specialist; Baker Rose and included in the trip derivation. A further clarification of the derivation has been provided in a form of a Technical Note prepared by BWB with Baker Rose.

4.5 A review of the comparison sites for SRFI across the Midlands indicates that three out of four sites are under construction. The most mature project at DIRFT (I and II) had surveys in 2016 which formed the basis for the trip rate review within the original note along with the rates from the other DCO applications. It is not proposed to assess further sites for comparison data.

4.6 The revised figures in **Table 7** are proposed to be included within the new PRTM 2.2 model run following review from members of the Transport Working Group.

APPENDICES

APPENDIX A: Hydrock – TR4 Trip Generation Document
(07700-HYD-XX-XX-RP-TP-1003)

TECHNICAL DESIGN NOTE

Hydrock

Project name	Hinckley National Rail Freight Interchange
Design note title	Trip Generation (vehicles)
Document reference	07700-HYD-XX-XX-RP-TP-1003
Author	Rory McHugh
Revision	P08
Date	22 November 2018

Trip Generation

1. INTRODUCTION

1.1.1 This Technical Note has been prepared to present trip rates and a methodology for calculating the trip generation associated with the Hinckley National Rail Freight Interchange (NRFI) development proposals.

1.1.2 It is intended that this note will be submitted to Leicestershire County Council (LCC) and Highways England (HE) for approval. It responds to comments provided on previous submissions, and therefore supersedes any previous information presented.

2. DEVELOPMENT PROPOSAL

2.1.1 The current development proposal consists of a NRFI and 850,000sqm of B8 warehousing/distribution (consisting of 650,000sqm building footprint and 200,000sqm of mezzanine floor space).

2.1.2 It is anticipated that the NRFI trips will be entirely self-contained, with the associated trips travelling between the warehousing and the rail terminal. However, notwithstanding this position, a 'without prejudice' assessment is presented here whereby a proportion of associated trips will be external.

2.1.3 These operations are subject to verification following an assessment of market conditions, but provides consistency with the approaches taken by other comparable sites (further details follow).

2.1.4 The development proposal is subject to change but, whilst the floor areas may reduce, the trip rates presented here are considered appropriate for continued use on a pro rata basis, and represent a worst-case scenario.

3. REVIEW OF RELEVANT PLANNING HISTORY/CONSENTS

3.1.1 To ascertain trip rates for the Hinckley NRFI development proposal, a review of relevant planning history has been undertaken. The reference sites were identified at a meeting with Highways England (HE), its consultants Aecom, and Leicestershire County Council (LCC) on Wednesday 14 February and then again at a subsequent meeting on Wednesday 9 May.

3.1.2 At the above meetings, seven sites were identified for review and consideration. These include:

1. Magna Park Extension, Lutterworth
2. Symmetry Park, Lutterworth
3. Daventry International Rail Freight Terminal (DIRFT III)
4. West Midlands Interchange
5. East Midlands Gateway
6. Rail Central
7. Northampton Gateway

3.1.3 At the time of the above discussions and when preparing previous revisions of this report, the availability of data for '6 Rail Central' and '7 Northampton Gateway' was limited due to their respective applications not yet having been submitted. As such, in previous analyses those two sites were excluded and all of the other five sites included to maintain an appropriate sample size. However in the time that has passed information is now available for '6 Rail Central' and '7 Northampton Gateway'. This provides a greater sample size from which to select the most appropriate sites, with the latest data and methodologies (all with the benefit of the methodologies having been approved by the respective LHA's and HE).

3.1.4 Due to the increased sample size now avaialble, '1 Magna Park' and '2 Symmetry Park' have now been excluded due to the absence of rail freight terminals at these locations, and replaced with '6 Rail Central' and '7 Northampton Gateway'.

3.1.5 This provides us with five comparable sites that all have the benefit of being served by a rail freight terminal and are of comparable size, namely:

3. Daventry International Rail Freight Terminal (DIRFT III)
4. West Midlands Interchange
5. East Midlands Gateway
6. Rail Central
7. Northampton Gateway

3.1.1 To confirm the appropriateness of the above sites to serve as comparators for the Hinckley proposal, a comparison of development details and site location characteristics has been undertaken, and which is presented in Table 3.1 and Table 3.2. It is concluded that that the sites are considered as suitable comparators from which to derive the Hinckley NRFI trip generation.

Table 3.1: Comparable site overview

	Development	Applicant	DCO Application reference	Proposal (B8 element)	Date of TA	Method of trip rate calculation	Rail freight?	Shift timings evident/secured?	Peak hour or daily trip rates?
3	**Daventry International Rail Freight Terminal (DIRFT III)**	Rugby Radio Station Limited Partnership (RRSLP) and Prologis UK Limited	TR50001 (PINS)	731,000 sqm of rail served storage and distribution floorspace	2013	Traffic surveys of existing DIRFT I and intermodal terminal - 2011	✓	Typical shift timings anticipated, but no restrictions sought from LCC	Peak hour – ES contains AADT
Comments:	DCO application approved | Trip rate source: Table 6.1 (page 75) of Transport Assessment dated February 2013								
4	**West Midlands Interchange**	Four Ashes Ltd	TR050005 (PINS)	743,200 sqm of rail served warehousing and ancillary service buildings	2017	Traffic surveys of existing DIRFT I and intermodal terminal - 2016	✓	Operation 24 hours per day – typical shift times expected	Peak hour and daily
Comments:	DCO application submitted to PINS August 2018 | Trip rate source: Table 12 (page 87) and Table 16 (page 89) of Transport Assessment dated July 2018								
5	**East Midlands Gateway**	Roxhill Developments Ltd	TR050002 (PINS)	557,414 sqm of rail served warehousing and ancillary service buildings	2014	Trip rates derived from Swan Valley surveys - 2007	✓	Operation 24 hours per day – typical shift times expected	Peak hour and daily
Comments:	DCO application approved | Trip rate source: Table 6 (page 17) of TN04: Trip Rates and Traffic Generation dated October 2012								
6	**Rail Central**	Ashfield Land and Gazeley GLP	TR050004 (PINS)	up to 702,097 sqm of rail served storage and distribution floorspace	2018	Trip rates from East Midlands Gateway SRFI and GB Freight Model – in turn East Mids Gateway uses Swan Valley surveys – 2007	✓	Operation 24 hours per day – typical shift times expected	Peak hour and daily
Comments:	DCO application submitted September 2018 | Trip rate source: Table 7.4 (page 63) and Table 7.5 (page 65) of Transport Assessment dated February 2018								
7	**Northampton Gateway**	Roxhill Developments Ltd	TR050006 (PINS)	Up to 545,500 sqm rail served storage and distribution floor space	2017	Trip rates derived from Swan Valley surveys - 2007	✓	Operation 24 hours per day – typical shift times expected	Peak hour and daily
Comments:	DCO application submitted 21 May 2018 | Trip rate source: Table at paragraph 8.4 (page 20) of TN 02: Trip Generation dated February 2017								

Table 3.2: Comparable site location characteristics

	Development	Planning Region	Location type[1]	Population <1 mile	Population <5 miles	Car ownership <5 miles	Public Transport accessibility (bus and rail)	Pedestrian/Cycle connectivity	Proximity to SRN
*	HINCKLEY NRFI	Leicestershire	Freestanding	2,177	135,767	1.49	Direct public transport services to be provided.	Yes, footway connections proposed connecting to Hinckley	Direct access to M69 J2
3	Daventry International Rail Freight Terminal (DIRFT III)	Northamptonshire	Freestanding[2]	988	85,872	1.37	Bus stops adjacent to the site, proposed bus stops within the site.	Yes, connections to existing footway/cycleway network	Access to M1 J18 via A5 1.9km to the south
4	West Midlands Interchange	Staffordshire	Freestanding[3]	549	126,021	1.36	Bus service adjacent to the site, half-hourly frequency. Shuttle bus service proposed.	Yes, footway/cycleway connections proposed	Access to M6 J12 via A5 0.8km to the east
5	East Midlands Gateway	Leicestershire	Freestanding[4]	2,555	90,398	1.43	Public transport interchange (bus) at site access.	Yes, footway/cycleway connections proposed to Kegworth and East Midlands Airport	Access to M1 J24 via A453 2km to the north
6	Rail Central	Northamptonshire	Freestanding	1,811	139,122	1.43	Bus interchange proposed on site, extension of service and out of hours services to/from Northampton.	Yes, footway/cycleway proposed towards Northampton.	Access to M1 J15A via A43 1.7km to the north
7	Northampton Gateway	Northamptonshire	Freestanding	2,818	140,105	1.43	Dedicated bus service to Northampton proposed, new stops on A508 and extension to existing service.	Yes, footway connection to Northampton over M1 retained, footway cycleway proposed along A508 to Northampton	Access to M1 J15 via A508 0.5km to the north

[1] "Main Location: Free Standing (Out of Town) Just beyond the physical edge of the nearest town/city, or in an isolated rural location (sites in villages are within the Neighbourhood Centre category). The distance from the edge of the town/city which qualifies a site as Free Standing is not set, and is instead judged on a site-by-site basis, proportional to the size of the town/city (Source: TRICS Location Definitions – December 2008)

[2] Adjacent to existing rail freight interchange but remote of population centres

[3] Adjacent to existing warehousing but remote of population centres

[4] West of Castle Donnington, north of East Midlands Airport, but remote of population centres

4. TRIP TYPES

4.1.1 The proposed national rail freight terminal and the associated warehousing would generate the following trip types:

1. Rail freight terminal:
   a. HGV trips internal
   b. HGV trips external
   c. Light vehicles (employee/visitor) trips external
2. B8 Warehousing with rail freight terminal operational
   a. HGV trips internal
   b. HGV trips external
   c. Light vehicles (employee/visitor) trips external
3. B8 Warehousing with rail freight terminal not operational (early phase development)
   a. HGV trips external
   b. Light vehicles (employee/visitor) trips external

5. RAIL FREIGHT TERMINAL TRIP GENERATION - TOTAL TRIPS

5.1.1 The design and assessment of the rail freight terminal is being led by WSP and Baker Rose, who have also undertaken a bespoke trip generation exercise linked directly to the estimated terminal handling capacities.

5.1.2 A number of factors impact the capacity of a terminal:

- Track Capacity = the number of trains that can be unloaded at one time
- Track Utilisation = the number of trains per day that can be unloaded on each track
- Installed Crane Capacity = Lifts per hour X operational hours per day X number of cranes
- Container storage capacity
- Train length
- Operating days per annum
- Operating efficiency

5.1.3 It is anticipated that the rail terminal will operate 7 days per week. This will be at full capacity during the weekdays, but with much reduced operations on the weekend. It is anticipated that, at full capacity, up to 12 trains per day will be handled on a weekday, but only around four trains per day are expected to be handled on a Saturday or Sunday.

5.1.4 Factoring in the above, WSP/Baker Rose has prepared a technical paper titled *Hinckley NRFI Background Paper: Road Traffic Movements Associated with the Rail Freight Terminal* (included as Appendix A) which sets out the associated trip generation. This has been summarised in Table 5.1, Table 5.2 and **Error! Reference source not found.**.

Table 5.1: Rail terminal HGV movements per train

Container movements per train	One-way lifts	Two-way lifts
Twenty-foot unit equivalents (TUE) (max)	96	192
Number of containers (max)	64	128
Number of containers at 80% efficiency	52	104
HGV movements per train	**One-way trip**	**Two-way trips**
Number of HGV movements (1.35 per container)	70	140

Table 5.2: Rail terminal HGV movements per day

HGV movements per day	One-way trip	Two-way trips
Number of trains per week day	12	
Number of containers per week day	624	1,248
Number of HGV movements per week day	840	1,680
Number of trains per weekend day	4	
Number of containers per weekend day	208	416
Number of HGV movements per weekend day	280	560

Table 5.3: Rail terminal HGV movements per annum

HGV movements per annum	One-way trip	Two-way trips
Week day operating days per annum	260	
Week end operating days per annum	104	
Number of HGV movements per annum	247,520	495,040

5.1.5 To convert the daily figures into an hourly rate, a daily profile is necessary. For this purpose we have applied a daily profile obtained from the Rail Central Rail Operations Report[5], as set out in Figure 5.1 and Table 5.4 below.

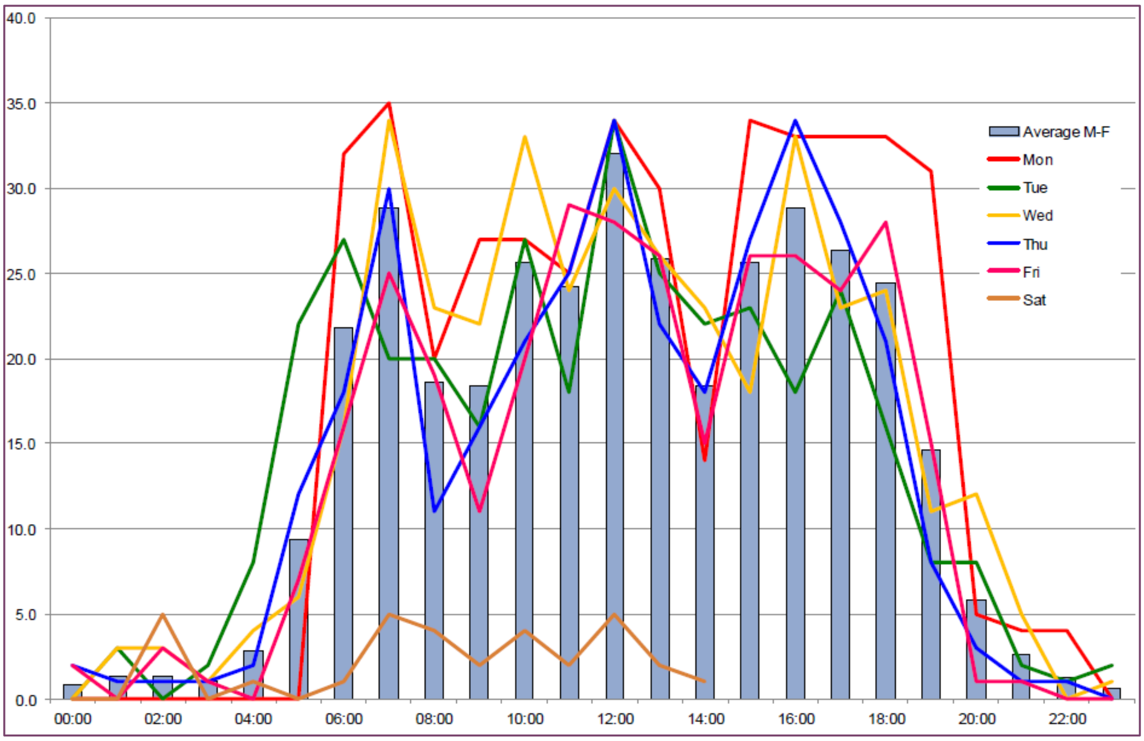

Figure 5.1: Extract of Rail Central Rail Operations Report Figure 14: HGV Distribution by day/time

5 [redacted]

5.1.6 There is limited information available on rail terminal daily trip profiling – but the above has been approved for use within the rail central report and is itself derived from operational studies of Hams Hall. It's therefore considered a suitable and evidenced proxy from which to estimate the daily profile of HGV terminal traffic.

Table 5.4: Rail Central Rail Operations Report HGV Distribution percentages by hour

Hour	00:00	01:00	02:00	03:00	04:00	05:00	06:00	07:00
Average M-F	0.8	1.4	1.4	1.0	2.8	9.4	21.8	28.8
Percentage	0.2%	0.4%	0.4%	0.3%	0.8%	2.6%	6.0%	8.0%
Hour	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00
Average M-F	18.6	18.4	25.6	24.2	32.0	25.8	18.4	25.6
Percentage	5.2%	5.1%	7.1%	6.7%	8.9%	7.2%	5.1%	7.1%
Hour	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
Average M-F	28.8	26.4	24.4	14.6	5.8	2.6	1.2	0.6
Percentage	8.0%	7.3%	6.8%	4.1%	1.6%	0.7%	0.3%	0.2%

5.1.7 Table 5.4 is displayed graphically in Figure 5.2.

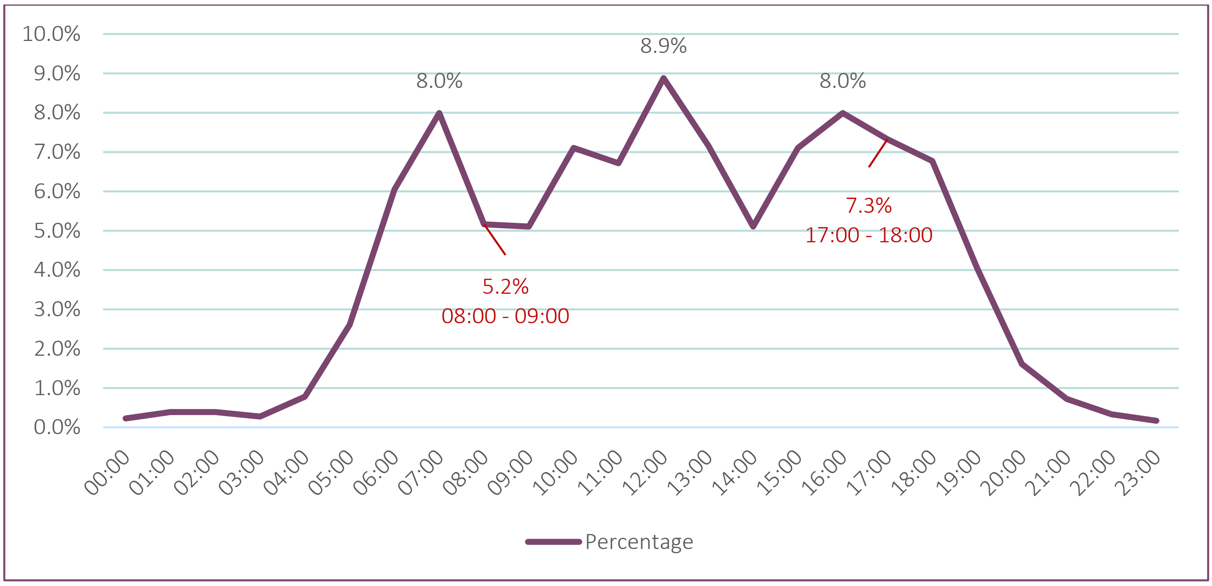

Figure 5.2: Graphical representation of Rail Central Rail Operations Report HGV Distribution percentages by hour

5.1.8 Applying the daily profile percentages derived above, the daily profile of Hinckley NRFI HGV trips is presented as follows:

Table 5.5: Hinckley rail terminal HGV trips by hour (two-way)

Hour	00:00	01:00	02:00	03:00	04:00	05:00	06:00	07:00
Hinckley rail terminal trips	4	7	7	5	13	44	102	134
Hour	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00
Hinckley rail terminal trips	87	86	119	113	149	120	86	119
Hour	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
Hinckley rail terminal trips	134	123	114	68	27	12	6	3

5.1.9 In addition to the above, Baker Rose has indicated that a small number of light vehicle trips are also expected, arising from employee and visitor/servicing trips. This equates to 112 two-way trips (56 arrivals, 56 departures) all occurring outside of the peak hours (full details set out in the attached Baker Rose/WSP technical note at Appendix A).

5.1.10 The total trip generation of the rail freight terminal is therefore set out in Table 5.6.

Table 5.6: Rail freight terminal total trip generation (maximum)

	AM Peak (0800 – 0900)			PM Peak (1700 – 1800)			Daily (24 hour)		
	Arrival	Departure	Total	Arrival	Departure	Total	Arrival	Departure	Total
LGV's	0	0	0	0	0	0	56	56	112
HGV's	44	44	87	61	61	123	840	840	1,680
Total	44	44	87	61	61	123	896	896	1,792

6. RAIL FREIGHT TERMINAL TRIP GENERATION – CALCULATION OF INTERNALISATION

6.1.1 The Baker Rose/WSP technical work identifies the following split of internal/external HGV trips to the Hinckley rail terminal:

Table 6.1: Hinckley rail terminal HGV internal/external movement proportions

Internal	External
40%	60%

6.1.2 Applying the above proportions to the total maximum daily rail terminal movements, the following rail terminal HGV trips are calculated:

Table 6.2: Hinckley rail terminal HGV internal/external movements (maximum)

	AM Peak (0800 – 0900) 5.2%			PM Peak (1700 – 1800) (7.3%)			Daily (24 hour)		
	Arrival	Departure	Total	Arrival	Departure	Total	Arrival	Departure	Total
Internal (40%)	17	17	35	25	25	49	336	336	672
External (60%)	26	26	52	37	37	74	504	504	1,008
Total	44	44	87	61	61	123	840	840	1,680

7. B8 WAREHOUSING TRIP GENERATION – RAIL FREIGHT TERMINAL OPERATIONAL SCENARIO

7.1 Overview

7.1.1 As discussed, five sites have been included to calculate the most appropriate trip rates for the B8 warehousing units. The following sites have been included within the analysis:

- Daventry International Rail Freight Terminal (DIRFT III)
- West Midlands Interchange
- East Midlands Gateway
- Rail Central
- Northampton Gateway

7.1.2 To derive a trip rate for application to the Hinckley NRFI proposal, a conventional method consisting of deriving a mean average of the comparable/relevant sites has been undertaken. This is set out in detail below.

7.1.3 Due to the fact that the surveys used are of operational facilities that already have rail freight terminal connections, the surveyed trips to/from the warehousing will already have included within them an element of road freight having been displaced by rail freight, and internal movements. The trip generation contained within this section therefore represents the warehousing operations **with** the rail freight terminal operational. The **without** rail freight terminal scenario is discussed in Section 8.

7.2 Comparable site approved trip generation

Daventry International Rail Freight Terminal (DIRFT III)

7.2.1 The trip rates for the DIRFT III application have been derived from comprehensive surveys carried out in March 2011 at the operational Daventry International Rail Freight Terminal. The trip rates included in the DIRFT III Transport Assessment produced in February 2013 are summarised in Table 7.1.

Table 7.1: DIRFT III Warehouse AM and PM Trip Rates

	AM Peak (0800 – 0900)			PM Peak (1700 – 1800)		
	Arrival	Departure	Total	Arrival	Departure	Total
LGV's	0.088	0.017	0.105	0.056	0.091	0.147
HGV's	0.020	0.022	0.042	0.025	0.030	0.055
Total	0.108	0.039	0.147	0.081	0.121	0.202

7.2.2 The TA did not include daily trip rates, however these have instead been derived from the respective ES Transport chapter. The daily trip rates set out in Table 7.2.

Table 7.2: DIRFT III B8 Forecast Daily Trip Rates

	Daily (24 Hour)		
	Arrival	Departure	Total
LGV's	0.718	0.718	1.436
HGV's	0.539	0.539	1.079
Total	1.257	1.257	2.515

West Midlands Interchange (WMI)

7.2.3 The trip rates for the WMI have again been derived from comprehensive surveys carried out at DIRFT - in 2016. The trip rates per 100sqm of the warehousing units have been derived based on the results of the surveys and the known gross floor areas of each unit.

7.2.4 For the purposes of this assessment the trip rates for the warehousing facilities have been extrapolated from the West Midlands Interchange Transport Assessment as produced in July 2017. These are summarised in Table 7.3.

Table 7.3: WMI B8 AM, PM and Daily Trip Rates

	AM Peak (0800 – 0900)			PM Peak (1700 – 1800)			Daily (24 hour)		
	Arrival	Departure	Total	Arrival	Departure	Total	Arrival	Departure	Total
LGV's	0.072	0.012	0.084	0.040	0.059	0.099	0.834	0.821	1.655
HGV's	0.017	0.016	0.033	0.017	0.022	0.039	0.382	0.366	0.784
Total	0.089	0.028	0.117	0.057	0.081	0.138	1.216	1.187	2.403

East Midlands Gateway

7.2.5 The trip rates for the East Midlands Gateway assessment were derived from surveys of Swan Valley in 2007, and applied as above on a pro rata 100m^2 basis. The East Midlands Gateway trip rates are set out in Table 7.4.

Table 7.4: East Midlands Gateway B8 Trip Rates

	AM Peak (0800 – 0900)			PM Peak (1700 – 1800)			Daily (24 hour)		
	Arrival	Departure	Total	Arrival	Departure	Total	Arrival	Departure	Total
LGV's	0.121	0.013	0.134	0.029	0.108	0.137	1.060	1.043	2.103
HGV's	0.019	0.023	0.042	0.020	0.024	0.044	0.459	0.475	0.934
Total	0.1401	0.036	0.176	0.049	0.132	0.181	1.519	1.517	3.036

Rail Central

7.2.6 Trip rates for Rail Central were derived from trip generation methodologies used as part of the Transport Assessments for the DIRFT, East Midlands Gateway and Radlett SRFI sites.

7.2.7 The trip rates derived from the Transport Assessment for Rail Central are summarised in Table 7.5.

Table 7.5: Rail Central B8 AM, PM and Daily Trip Rates

	AM Peak (0800 – 0900)			PM Peak (1700 – 1800)			Daily (24 hour)		
	Arrival	Departure	Total	Arrival	Departure	Total	Arrival	Departure	Total
LGV's	0.119	0.013	0.132	0.039	0.137	0.176	1.087	1.070	2.157
HGV's	0.020	0.023	0.043	0.022	0.023	0.045	0.477	0.477	0.953
Total	0.138	0.036	0.176	0.061	0.160	0.221	1.564	1.547	3.111

Northampton Gateway

7.2.8 The trip rates for the Northampton gateway site were again calculated using data readily available. The average trip rate was correlated for 12 sites to the proposed development including Swan Valley and DIRFT.

7.2.9 Within the Transport Assessment for the site it was identified that the Swan Valley site was particularly relevant and would therefore provide a good starting point for the assessment of the B8 use that is proposed on the Northampton Gateway site.

7.2.10 To ensure a robust assessment the Swan Valley trip rates were compared with the average trip rates of the 12 comparable sites. For light vehicles these trip rates were identified to be over and above the average and therefore were considered appropriate for use. However, for HGV vehicular movements the average of the 12 comparable sites identified trip rates in excess of what had been recorded at Swan Valley and therefore the average trip rates were considered appropriate for inclusion as part of the analysis.

7.2.11 The trip rates derived from the Transport Assessment for Northampton Gateway are summarised in Table 7.6.

Table 7.6: Northampton Gateway B8 AM, PM and Daily Trip Rates

	AM Peak (0800 – 0900)			PM Peak (1700 – 1800)			Daily (24 hour)		
	Arrival	Departure	Total	Arrival	Departure	Total	Arrival	Departure	Total
LGV's	0.128	0.014	0.142	0.042	0.147	0.190	1.135	1.117	2.252
HGV's	0.025	0.024	0.049	0.025	0.024	0.049	0.389	0.390	0.778
Total	0.154	0.038	0.191	0.067	0.171	0.239	1.524	1.507	3.030

7.3 Hinckley B8 trip rates (average of the above sites) – with rail freight terminal efficiencies inherent

7.3.1 Based on the trip rates calculated for the individual comparable sites the average trip rate has been calculated. This average trip rate is summarised in Table 7.7 and the calculated trips provided in Table 7.8.

Table 7.7: Hinckley B8 AM, PM and Daily Trip Generation

	AM Peak (0800 – 0900)			PM Peak (1700 – 1800)			Daily (24 hour)		
	Arrival	Departure	Total	Arrival	Departure	Total	Arrival	Departure	Total
LGV's	0.106	0.014	0.119	0.041	0.108	0.150	0.967	0.954	1.921
HGV's	0.020	0.022	0.042	0.022	0.025	0.046	0.449	0.449	0.898
Total	0.126	0.035	0.161	0.063	0.133	0.196	1.416	1.403	2.819

Table 7.8: Hinckley warehousing AM, PM and Daily Trip Generation

	AM Peak (0800 – 0900)			PM Peak (1700 – 1800)			Daily (24 hour)		
	Arrival	Departure	Total	Arrival	Departure	Total	Arrival	Departure	Total
LGV's	899	117	1,016	351	922	1,273	8,218	8,108	16,326
HGV's	172	184	356	186	209	395	3,818	3,819	7,637
Total	1,071	301	1,372	536	1,131	1,668	12,035	11,927	23,962

Disaggregated Light Vehicle Trips

7.3.2 The assessment methodologies for the five sites set out within Section 7.2 have been reviewed to establish whether any disaggregation of light vehicle trips between employee commuter trips and site operational trips has been established from the various site surveys undertaken.

7.3.3 From this review, none of the assessments accompanying the five sites has drawn this distinction. The Transport Assessment prepared by WSP for the West Midlands Interchange does acknowledge that there would be a mix within the light vehicle trips however states, "*the non-HGV (light vehicle) trip generation primarily consists of employee vehicles, although there is a smaller element of vans which service the area.*" This element would be expected to be an immaterial proportion of the overall light vehicle trips, particularly during the peak periods subject to assessment. Furthermore, the distribution of such trips would not be expected to differ substantially from that of employees as they would be expected to route to/from local population centres. On this basis it is not proposed to disaggregate the light vehicle trips further.

8. B8 WAREHOUSING TRIP GENERATION – RAIL FREIGHT TERMINAL NOT OPERATIONAL SCENARIO (FOR PHASING PURPOSES)

8.1.1 It is anticipated that the development will be brought forward in phases, with B8 warehousing units expected to be operational early in the programme and ahead of the rail terminal becoming operational. As such, it is necessary to calculate a trip rate for the isolated phases of development for a 'without rail terminal' scenario. This trip rate can be applied pro-rata to the respective phase floor areas as/if they come forward in advance of the rail terminal.

8.1.2 As stated above, the use of traffic surveys from operational facilities that already have rail freight terminal connections will already have included within them an element of displaced road freight having been replaced by rail freight, and internal movements instead occurring. Section 7 presents the 'with operational rail terminal' scenario trip rates, and therefore this section presents the 'without' rail terminal scenario trip rates.

8.1.3 With the rail freight terminal displacing road-based freight, it is considered reasonable to assume that the number of internal HGV movements generated by the rail terminal (calculated in Section 6) is proportional to the volume of trips that would otherwise have been road based. As such, the 'without' rail terminal scenario can be calculated by combining the rail terminal internal trips (Table 6.2) with the Hinckley B8 mean average rates derived from the comparative assessments (Table 7.8) and deriving a trip rate from this higher trip generation. This is presented in Table 8.1 and Table 8.2 below.

Table 8.1: B8 warehousing (850,000sqm) + rail terminal internal trips

	AM Peak (0800 – 0900)			PM Peak (1700 – 1800)			Daily (24 hour)		
	Arrival	Departure	Total	Arrival	Departure	Total	Arrival	Departure	Total
LGV's	899	117	1,016	351	922	1,273	8,218	8,108	16,326
HGV's	190	201	391	210	234	444	4,154	4,155	8,309
Total	1,089	318	1,407	561	1,156	1,717	12,371	12,263	24,634

Table 8.2: B8 warehousing without rail trip rates (back calculated from the above trip generation)

	AM Peak (0800 – 0900)			PM Peak (1700 – 1800)			Daily (24 hour)		
	Arrival	Departure	Total	Arrival	Departure	Total	Arrival	Departure	Total
LGV's	0.106	0.014	0.119	0.041	0.108	0.150	0.967	0.954	1.921
HGV's	0.022	0.024	0.046	0.025	0.027	0.052	0.489	0.489	0.978
Total	0.128	0.037	0.166	0.066	0.136	0.202	1.455	1.443	2.898

9. TOTAL EXTERNAL TRIP GENERATION: WAREHOUSING AND RAIL TERMINAL COMBINED

9.1.1 The trip generation presented in Table 6.2 (rail terminal external trips) and Table 7.8 (B8 warehousing with rail terminal operational) combine to represent the total trip generation of the site with all elements fully built out and functioning. This combined total is calculated and presented in Table 9.1.

Table 9.1: Hinckley NRFI combined trip generation (B8 warehousing 850,000sqm and the rail freight terminal external trip generation)

	AM Peak (0800 – 0900)			PM Peak (1700 – 1800)			Daily (24 hour)		
	Arrival	Departure	Total	Arrival	Departure	Total	Arrival	Departure	Total
LGV's	899	117	1,016	351	922	1,273	8,274	8,164	16,438
HGV's	199	210	409	223	246	469	4,322	4,323	8,645
Total	1,097	327	1,424	573	1,168	1,741	12,595	12,487	25,082

Hydrock Consultants Ltd

Appendix A – Hinckley NRFI Background Paper: Road Traffic Movements Associated with Rail Freight Terminal

HINCKLEY NATIONAL RAIL FREIGHT INTERCHANGE

BACKGROUND PAPER

ROAD TRAFFIC MOVEMENTS ASSOCIATED WITH THE RAIL FREIGHT TERMINAL

JOINT PAPER PREPARED BY

BAKER ROSE CONSULTING LLP

AND

WSP

16th NOVEMBER 2018

HINCKLEY NATIONAL RAIL FREIGHT INTERCHANGE
BACKGROUND PAPER
ROAD TRAFFIC MOVEMENTS ASSOCIATED WITH THE RAIL FREIGHT TERMINAL

CONTENTS

APPENDICES

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1. INTRODUCTION

1.1 Baker Rose Consulting LLP and WSP have been instructed by db symmetry Ltd to advise on the development of the rail freight terminal forming a key part of the proposed development of the Hinckley National Rail Freight Interchange (HNRFI).

1.2 This Background Paper sets out the logic and methodology used to establish the trip generation anticipated to be associated with the rail freight terminal, to inform the wider trip modelling being undertaken by Hydrock.

1.3 The authors have been involved in the planning and development of significant and successful schemes of a similar nature, including DIRFT, London Gateway and Port Salford, as examples.

1.4 Hinckley NRFI is a Nationally Significant Infrastructure Project (NSIP) that accords with the policy requirements of a Strategic Rail Freight Interchange (SRFI). Accordingly, the scheme and the rail terminal have been master-planned to utilise rail primarily for moving unitised traffic (e.g. containers), with the capacity to have some buildings accessible for classic wagon traffic, should this specialist use be required by a particular occupier of the development.

1.5 The most intense and efficient use of rail associated with a SRFI will normally be by ISO container or swap-body[1], with the ability to load and unload trains relatively quickly. Classic wagon traffic has to have individual pallets, roll cages or material rolls removed from individual wagons while sat in sidings within or next to buildings. This is not the most efficient use of equipment generally, taking much longer to load and unload an individual train. It does however work well for some heavy loads, such as bottled water, paper and steel.

1.6 The unitised traffic will turnover a higher throughput of movements and the traffic movement analysis is therefore predicated on this being the most robust use for the Hinckley SRFI traffic modelling purposes.

[1] A swap body is a special type of freight container used in European and domestic flows, being lighter, bottom lifted and sometimes free standing. This container type may also be called exchangeable container or interchangeable unit when it can be swapped between road vehicles without needing a crane or reach stacker.

1.7 These services are normally referred to as intermodal traffic, as they provide for the movement by rail of unitised loads between different modes of transport. For sea containers these will be containers moved from ship to rail to road; or in the case of an SRFI, part of the throughput will be to on-site buildings using HGV's, or a skeleton trailer and port tug or similar, utilising red diesel. These will be instead of road movements to the SRFI occupiers on-site, that would otherwise have to travel by the public highway. It also means that the volume destined for the SRFI on-site occupiers will reduce the volume of intermodal traffic needing to use the public highway, to reach their destination.

2. BACKGROUND AND RAIL CONNECTIVITY

2.1 The use of rail freight will depend on a number of key variables, with success related to ease of access to the mainline and economic viability, which is not purely distance related. Rail equipment utilisation is a crucial part of the economics of operating viable rail freight services. Intensive use over relatively short distance works, as does long haul freight.

2.2 The Hinckley NRFI is exceptionally well located in this context, being on the relatively recently upgraded Felixstowe to Nuneaton mainline designed particularly to serve the deep-sea port of Felixstowe, also benefitting London Gateway, saving them from having to use the North London line and the more congested pathways of the West Coast Mainline, south of Nuneaton. It is gauge cleared to carry the highest 9'6" containers.

2.3 The Hinckley NRFI is on the mainline also linking the East Coast Main Line (at Peterborough) and the West Coast Main Line (at Nuneaton) providing access to the rest of the UK Railfreight Network. This includes to the expanding port of Liverpool and ports in the North East and at Southampton; as well as the major conurbations and their associated rail termini.

2.4 The scheme has been designed such that when fully developed out the terminal will be able to accommodate up to 12 trains per day and has the ability to deliver mainline access at both the eastern and western end of the site, with crossovers, allowing rail services to enter and depart from the site in either direction.

2.5 This level of service is already contained within Network Rail's rail freight growth forecast through this route. As such Hinckley is designed to provide the terminal capacity needed to help achieve this anticipated growth.

2.6 As forecast growth, these rail freight services are already built into the long term forecast used to plan additional passenger and freight services to and from the West Midlands to and through Leicester. As such it is understood that the Hinckley rail freight traffic should not conflict with the planned development of additional passenger services on this line.

2.7 The Leicester and Leicestershire Local Economic Partnership has identified the need for additional logistics accommodation in the region and in particular in the vicinity of Hinckley. This is to ensure a competitive position is retained for national and regional distribution services within the 'Golden Triangle', as well as increasing the capacity for Just in Time deliveries to aid the growth of the region's strong automotive sector, which it wants to encourage.

2.8 The Midlands Connect transport strategy strongly supports the development of more SRFIs, particularly where they address gaps in provision.

2.9 Accordingly it is anticipated that the occupiers at Hinckley NRFI will be utilising buildings with stock, parts and materials from a variety of international and national origins, which can be consolidated though ports of entry or other inland termini to provide containerised train load movements, utilising shared train services to maximise efficiency and reduce barriers to use.

2.10 As an SRFI, the terminal is expected to be regulated as an open access terminal to enable rail services to be provided by different freight train operating companies (FOC's), in accordance with market demand. Given the considerable strengths of the rail connections to the UK's key ports, as well as being within the logistics Golden Triangle and in close proximity to key manufacturers, the expectation is that the occupiers on this development will be relatively heavy users of the rail terminal.

2.11 The important difference between this scheme and the other East Midlands terminals is its close proximity to the manufacturing core of the West Midlands. From the outset DIRFT was seen as prime for Fast Moving Consumer Goods; and Hams Hall for heavier engineering. Hinckley NRFI is uniquely positioned to serve both, as expressed in the Leicester & Leicestershire Local Economic Partnership plan for the area.

2.12 The onward distribution from Hinckley occupiers is anticipated for modelling purposes to be via road to national, regional and local destinations, either to manufacturers, retailers or end users. Some products may have their secondary movement out undertaken by rail to other regions, including Scotland. This maybe to go through a regional distribution centre (RDC) elsewhere or to other major manufacturing centres, particularly in the North West and the North East. This would save lorry movements, but for forecasting purposes has not been assumed at this juncture.

3. TERMINAL DEVELOPMENT PROPOSALS

3.1 The terminal design has been developed in order to be able to be expanded in three phases and fully operational by the time the associated development is fully occupied. It will have a capacity of up to 12 trains per day each way, up to 775m long, with the ability to be served by overhead gantries to load and unload the boxes from the trains; and a semi-automated deep stack of containers, stacked 5 deep and 5 high. The rail terminals total holding capacity is estimated at 3,925 TEU[2].

3.2 The majority of deep-sea containers used are now 40' (2TEU's), but there are still 20's in use too, particularly used for heavy goods. The European and domestic flows are increasingly using 45' containers and curtain sided swap-bodies, which will compete with articulated lorry movements better in terms of capacity. The latter are not usually stackable and as such are expensive to store.

3.3 The reason both TEU's stored and containers lifted/moved are referred to in the industry is that the TEU will relate to the revenue created from storage, whilst lift revenues will relate to the number of containers moved. For the purpose of traffic impacts, only the containers moved is of direct importance. The level of storage will provide an ability to disconnect arrival and departure times of trains, with the arrival and departure of road movements. It will also enable sequencing of containers over long distances and times, to demand for the contents, although only by a few days in the case of Hinckley.

3.4 The National Rail Freight Network is gradually being upgraded to accommodate 775m train lengths, but this requires significant investment in re-signalling and creating longer

[2] A TEU is a twenty-foot equivalent, being the length of the smallest ISO container used in deep sea shipping. The widths are standard at 8' and vary in height from the old 8' and 9''s through to the more common 'standard container' at 8'6" high and 'high cube container', at 9'6" high.

freight loops across the country. Much of this is therefore being undertaken as part of other network changes and upgrades, when the opportunity arises, as well as targeted investment to enable more freight on key routes. Currently the standard intermodal length of trains used in most cases will be 600m.

3.5 The Felixstowe to Nuneaton Line can currently accept a maximum train length of 686 metres (or 103 SLU's (Standard Length Units) being a traditional rail measurement relating to 21' wagons; plus an engine). This would accommodate a 670m train comprising an engine and 32 twinned FEA[3] wagons, 16 pairs, with an overall capacity of 96 TEU's, 64 containers (at one 40'and one 20' on each wagon).

3.6 There are a number of different rail wagons utilised. Some specialised wagons with deep 'pockets' (i.e. containers sit lower than on a standard flat-bed wagon to accommodate the additional height of the units) are designed to accept up to 9'6 high containers through lower gauged areas of the rail network, including through Kent to the Channel Tunnel. The nature of these wagons though means that they can carry fewer containers for the length of a train, compared with standard flat wagons such as the FEA wagon, which has been utilised for the trip modelling.

3.7 The wagon is operated in pairs (twins) and has a 60' platform on each wagon, i.e. taking 3 TEU on each, either as one 40' and one 20', or three 20's. As mentioned previously, the largest proportion of containers are 40's. As such the reality is that it would be exceptional for all wagons to be fully loaded with containers, to 100% capacity of a train.

3.8 In the model attached we have set out the background to the calculations in relation to lifts and containers moved. Using 40' and 20' will provide the highest number of movements for traffic purposes. If wagon design and demand moved to 45' containers, the number of containers per train would decrease. For example, over 180' of wagon space this would comprise 9 TEU, typically 3 x 40's and 3 x 20's, requiring 6 container moves. At 180' wagon space, at 45', only 4 containers would be moved.

3.9 Thus for a pair of FEA wagons, being worked between a major port and Hinckley, we would expect a high level of utilisation to reflect both demand and the need to be efficient, as the ports need to maximise their use of rail to move boxes quickly from the

[3] FEA wagons are twinned flat wagons each with a tare weight of 20 tonnes and 82.5 tonne carrying capacity, with a 60' loadable length, as operated by GB Railfreight and Freightliner, amongst others.

quay side. The industry standard for this for a whole train, is recognised as an 80% loading efficiency in terms of containers. Beyond this will be hard to achieve.

3.10 Given the exceptional qualities of the Hinckley location in rail and road terms and likely access to and from the Ports, we have adopted intensive use assumptions which we consider provides a robust and appropriate test of the impact of the scheme.

3.11 The calculations for HGV movements based on the above have been set out in the appended models.

4 HGV TRIP GENERATION

4.1 The use of containers moved rather than TEU capacity is important for assessing transport movements, as each container is deemed for the purposes of stress testing, to be moved independently by road. 20' boxes tend to be used to carry heavy materials and, on average, weigh more than 40' boxes. Sometimes two 20' containers will be moved together by road, but this would normally only be for the re-positioning of empties.

4.2 The appended model details primary trunk movements by rail, to Hinckley NRFI and then into adjoining buildings or off-site to regional businesses. Of the movements inbound by rail, it is reasonable to assume that everything that comes in by rail will be returned by rail via a similar route. If empties are re-routed for back loading, if not returned to the port via Hinckley, they are likely to be replaced by other containers being returned or used for exports, through Hinckley.

4.3 To be robust it is assumed that all 20' containers will be moved by HGV on their own. Whilst it is in the interest of hauliers to arrive loaded and depart loaded, as they won't generally get paid for travelling without a box, the reality is that some will have to do so to meet schedules. Whilst at Hinckley we would expect efficient use of haulage given the mature logistics location generally, we have adopted a figure in line with industry expectations, of an average of 1.35 two-way HGV trips per container moved[4].

[4] Geoff Bounds Consulting Ltd Trip Rates & Traffic Generation for East Midlands Gateway – data at BIFT, DIRFT, Hams Hall and Widnes observed an average ratio of 1.34 two-way HGV's trips per container moved.

4.4 The split between on-site movement between the terminal and the occupiers at Hinckley NRFI; and the terminal and regional occupiers, will have an impact on the number of movements onto the local road network. However, in the context of distribution logistics for a scheme of this magnitude, the total change in numbers caused by a greater or lesser use of the rail services by regional businesses is not very significant.

4.5 We have attached two versions of the UK CONTAINERS TO TRAIN MOVES TO HGV model. v6.1 (Appendix 1) identifies that at 33% of rail moves taken off site and 67% retained on-site, at 12 trains per day, a total of 554 off site HGV moves will be created. This is seen as the sort of level that a terminal of this quality location should be achieving. A view shared at DIRFT in its DIRFT III Needs Report.

4.6 The model v6.2 (Appendix 2) at 60% of container movements going off site is comparable to East Midlands Gateway assumptions and is seen as low retention on site and therefore, provides a very robust approach for this scheme. This shows that at 60% of rail moves taken off site and 40% retained on-site, at 12 trains per weekday, a total of 1,008 off site HGV moves will be created.

4.7 This needs to be put into the context of 25,082 total container and HGV movements per day arising from the combined activities of the rail terminal and the logistics park operations.

4.8 Deep Sea Port rail freight moves are currently 5 to 5 ½ days a week, as can be seen recorded across the local rail network utilising for example, an advanced 24-hour search on realtimetrains.co.uk (see Appendix 3). This allows for the ports and rail freight network to be serviced at weekends and the container stack to spread the same volume over 7 days if needed. Domestic rail freight moves are moving to 7-day services for end consumer / retail products. This is not anticipated to form the bulk of HNRFI's volumes, but a split of 2/3rds deep sea and 1/3rd domestic has been assumed to provide a robust traffic model.

5. STAFF & SERVICE VEHICLE GENERATION

5.1 For the purposes of identifying indicative numbers of staff and service personnel coming and going from the site, it is assumed that the rail related HGV drivers will be arriving and departing only by HGV, being based elsewhere in the region. No facilities for HGV's to be based at the rail fright terminal are allowed for in the design and they are not at similar terminals in the region. Drivers would normally be based at their haulage depot or as part of a dedicated fleet associated with a warehouse. If HGV's are left and a car is used, it is likely to reduce HGV moves and increase car use on a 1 for 1 basis.

5.2 The staffing levels will be relatively low considering the throughput, due to the type and efficiency of the equipment once fully built out and servicing up to 12 trains per day. The current working assumption for total staffing levels is:

Manager	1
Security	6
Administration	6
Crane Operators	12
Miscellaneous	6

5.3 This total of 30 shift staff and 1 manager, will be split over 2 shifts per day, so a maximum of 16 staff per shift. This equates to 32 two-way light vehicle movements per shift (if all staff travel singularly by car), or 62 two-way light vehicle movements per day (manager to only work one shift).

5.4 Assuming 25 trade and service visits per day, this would equate to 50 two-way light vehicle movements. This is an estimate which allows for occasional visits by service and repair engineers for the cranes, as well as breakdowns for crippled wagons and damaged containers. General servicing of the office and security operations on site are allowed for as well as assuming visits from planners and other interested professionals and linked businesses.

5.5 In total therefore, 112 two-way light vehicle movements per day is anticipated (i.e. 62 + 50), and all would most likely occur outside of the peak periods (of 08:00-09:00 and 17:00-18:00) due to shift change over times, or trade visits likely arriving after or before the AM/PM periods respectively.

BAKER ROSE CONSULTING LLP & WSP
15th NOVEMBER 2018

APPENDIX 1

UK CONTAINER TRAIN MOVES TO HGV (6.1) – 33% off site

UK CONTAINER TRAIN MOVES TO HGV — 33% OFF SITE

HINCKLEY - FELIXSTOWE NUNEATON LINE — MAX LENGTH SLU 103

ASSUMPTIONS

Standard Length Unit (SLU)	21	**ft**	6.4008	m		
Engine Required	1		21	m		
Wagon Set Used	FEA	2	40.568	m		
	MAX	40'	2		TEU	4
	Balance	20'	2		TEU	2
	TOTAL CONTAINERS		4		TEU	6

PAIRED WAGON EFFICIENCY (for information only)

Containers per paired wagon set. Assumed no more than 2 x 20' per pair.

40'	0	1	2
20'	0	1	2

FEA TWIN - CONTAINERS LIFTED / MOVED		FEA TWIN - TEUs LOADING EFFICIENCY %	
2*40'+2*20'	4	6	100%
2*40'+1*20'	3	5	83%
2*40'+0*20'	2	4	67%
1*40'+2*20'	3	4	67%
1*40'+1*20'	2	3	50%
1*40'+0*20'	1	2	33%
0*40'+2*20'	2	2	33%
0*40'+1*20'	1	1	17%
0*40'+0*20'	0	0	0%

CONTAINERS MOVED / LIFTED PER TRAIN ONE WAY / HGV MOVES REQUIRED

All 20' assumed to be taken as single loads by HGV, not paired.
Some HGVs will arrive loaded and leave loaded; some will be loaded only one way.
The average number of HGV's assumed to be required to move a single container is 1.35

EXAMPLE TRAIN UTILISATIONS TO HGV MOVES EACH WAY

TEU	100%	84	96	108
CONTAINERS	100%	56	64	72
CONTAINERS at LOADING EFFICIENCY OF	**80%**	45	**52**	58
MAX TRAIN LENGTH	SLU's	90	**103**	117
MIN PASSING / RECEPTION SIDING	metres	603	686	**775**
TRAIN LENGTH USING FEA TWINS	metres	588	670	751
			Felixstowe Nuneaton	

ASSUMED MOVEMENTS		**HINCKLEY MOVES**	**INTERNAL MOVES**	**OFF-SITE MOVES**
		100%	67%	**33%**
CONTAINERS PER TRAIN AT LOADING EFFICENCY OF	80%	52	34	18
At ratio of HGV moves to deliver or collect one container	**1.35**	70	46	24
CONTAINERS IN AND OUT PER TRAIN	2	104	69	35
HGV moves per train to deliver and collect containers	**2**	**140**	**94**	**46**
TOTAL HGV MOVES PER WEEKDAY AT TRAINS PER DAY	12	**1,680**	**1,126**	**554**
TOTAL HGV MOVES PER WEEKEND AT TRAINS PER DAY	4	**560**	**375**	**185**
Weekday Operating Days per annum		260	260	260
Weekend Operating Days per annum		104	104	104
TOTAL HGV Moves@80% train occupancy per annum		495,040	331,677	163,363

WORKING MODEL dv6.1

IMPORTANT NOTES

The above assumed movements relate to the Felixstowe-Nuneaton Line capacity. Currently most intermodal trains run at upto c600m, which at 33% off site moves, would generate 475 total HGV moves per day. If all trains ran at 775m max, this would generate 618 HGV moves per day. Using the F2N max length provides a realsitic assumption, at 554 total HGV moves per day.

The Assumed Movements of HGV's will vary according to the split assumed between internal moves, to and from occupiers; and off-site moves to and from the surriounding area. This is a working model, so refects only the split inserted.

APPENDIX 2

UK CONTAINER TRAIN MOVES TO HGV (6.2) – 60% off site

UK CONTAINER TRAIN MOVES TO HGV — 60% OFF SITE

HINCKLEY - FELIXSTOWE NUNEATON LINE — MAX LENGTH SLU 103

ASSUMPTIONS

Standard Length Unit (SLU)	21	**ft**	6.4008	m		
Engine Required	1		21	m		
Wagon Set Used	FEA	2	40.568	m		
MAX	40'		2		TEU	4
Balance	20'		2		TEU	2
TOTAL CONTAINERS			4		TEU	6

PAIRED WAGON EFFICIENCY (for information only)

Containers per paired wagon set. Assumed no more than 2 x 20' per pair.

40'	0	1	2
20'	0	1	2

FEA TWIN - CONTAINERS LIFTED / MOVED		FEA TWIN - TEUs LOADING EFFICIENCY %	
2*40'+2*20'	4	6	100%
2*40'+1*20'	3	5	83%
2*40'+0*20'	2	4	67%
1*40'+2*20'	3	4	67%
1*40'+1*20'	2	3	50%
1*40'+0*20'	1	2	33%
0*40'+2*20'	2	2	33%
0*40'+1*20'	1	1	17%
0*40'+0*20'	0	0	0%

CONTAINERS MOVED / LIFTED PER TRAIN ONE WAY / HGV MOVES REQUIRED

All 20' assumed to be taken as single loads by HGV, not paired.
Some HGVs will arrive loaded and leave loaded; some will be loaded only one way.
The average number of HGV's assumed to be required to move a single container is 1.35

EXAMPLE TRAIN UTILISATIONS TO HGV MOVES EACH WAY

TEU	100%	84	96	108
CONTAINERS	100%	56	64	72
CONTAINERS at LOADING EFFICIENCY OF	80%	45	**52**	58
MAX TRAIN LENGTH	SLU's	90	103	117
MIN PASSING / RECEPTION SIDING	metres	603	686	**775**
TRAIN LENGTH USING FEA TWINS	metres	588	670	751
			Felixstowe Nuneaton	

ASSUMED MOVEMENTS		HINCKLEY MOVES	INTERNAL MOVES	OFF-SITE MOVES
		100%	40%	60%
CONTAINERS PER TRAIN AT LOADING EFFICENCY OF	80%	52	20	32
At ratio of HGV moves to deliver or collect one container	**1.35**	70	28	42
CONTAINERS IN AND OUT PER TRAIN	2	104	41	63
HGV moves per train to deliver and collect containers	**2**	**140**	**56**	**84**
TOTAL HGV MOVES PER WEEKDAY AT TRAINS PER DAY	12	**1,680**	**672**	**1,008**
TOTAL HGV MOVES PER WEEKEND AT TRAINS PER DAY	4	**560**	**224**	**336**
Weekday Operating Days per annum		260	260	260
Weekend Operating Days per annum		104	104	104
TOTAL HGV Moves@80% train occupancy per annum		495,040	198,016	297,024

WORKING MODEL dv6.2

IMPORTANT NOTES

The above assumed movements relate to the Felixstowe-Nuneaton Line capacity. Currently most intermodal trains run at upto c600m, which at 33% off site moves, would generate 475 total HGV moves per day. If all trains ran at 775m max, this would generate 618 HGV moves per day. Using the F2N max length provides a realsitic assumption, at 554 total HGV moves per day.

The Assumed Movements of HGV's will vary according to the split assumed between internal moves, to and from occupiers; and off-site moves to and from the surriounding area. This is a working model, so refects only the split inserted.

APPENDIX 3

EXAMPLE WEEKDAY AND WEEKEND TRAIN MOVEMETS ACTUAL THROUGH HINCKLEY

Realtime Trains | News | Search | Apps | Quick Search

LOCATION, DATE & TOC: Hinckley, 04/10/2018, All
CALLING AT?: Earlier, Later
WHAT TIME?: 0000 - 2359
SERVICES?: All Services, WTT order
STP: WTT, VAR, STP, CAN
SEARCH: Submit
Switch to Simple

-1 hr

+1 hr

Do you travel by train frequently? Can you help us collect GPS tracks for train services? Click here for more information.

Ind	Plan Arr	Act Arr	Origin	Pl	ID	TOC	Destination	Plan Dep	Act Dep
VAR	pass		Hams Hall Gbrf	1	4L23	ZZ	Felixstowe North Gbrf	0007½	0031½
VAR	pass		Northampton Castle Yard	1	425L	ZZ	Mountsorrel Sdgs	0110½	0037
VAR	pass		Felixstowe North F.L.T.		FRGT	ZZ	Ditton (Oconnor) Fliner	0218	(Q)
VAR	pass		Felixstowe North F.L.T.	2	453K	ZZ	Ditton (Oconnor) Fliner	0310	0302
VAR	pass		Margam T.C.	1	627M	ZZ	Corby B.S.C.	0510	0438
WTT	pass		Arpley Sidings		FRGT	ZZ	Middleton Towers	0519	(Q)
VAR	pass		Hams Hall Gbrf		FRGT	ZZ	Felixstowe North Gbrf	0537½	(Q)
WTT	0555	0555¼	Birmingham New Street	1	1L26	XC	Stansted Airport	0555	0555½
WTT	pass		Bescot Up Engineers Sdgs	1	6F16	ZZ	Cliffe Hill Stud Farm Gbrf	0606	0600½
WTT	pass		Carlisle N.Y.	1	639N	ZZ	Mountsorrel Sdgs	0610	0605¾
VAR	0624	0629	Birmingham New Street	1	1K01	XC	Leicester	0625	0629¼
WTT	0637	0638	Leicester	2	1P00	XC	Birmingham New Street	0638	0639¼
WTT	pass		Birmingham New Street	1	1L28	XC	Stansted Airport	0658½	0704½
WTT	0702	0710½	Leicester	2	1P02	XC	Birmingham New Street	0703	0711½
WTT	pass		Cambridge	2	1N40	XC	Birmingham New Street	0724½	0724¾
WTT	0729	0729¾	Birmingham New Street	1	1K03	XC	Leicester	0730	0730½
VAR	pass		Felixstowe South Gbrf	2	4M04	ZZ	Hams Hall Gbrf	0732	0735
WTT	0741	0743¾	Leicester	2	1P04	XC	Birmingham New Street	0742	0745
WTT	pass		Felixstowe North Gbrf		FRGT	ZZ	Trafford Pk Euro Tml Gbrf	0750	(Q)
WTT	0756	0804	Birmingham New Street	1	1L30	XC	Stansted Airport	0757	0804¼
WTT	0809	0809½	Stansted Airport	2	1N41	XC	Birmingham New Street	0810	0810¾
WTT	pass		Toton T.M.D.		362L	ZZ	West Hampstead North Jn.	0816½	Cancel
WTT	pass		Felixstowe North F.L.T.		FRGT	ZZ	Garston F.L.T.	0829½	(Q)
WTT	0831	0832	Birmingham New Street	1	1K05	XC	Leicester	0831	0832¼
WTT	0836	0836¾	Leicester	2	1P06	XC	Birmingham New Street	0836	0837¾
WTT	pass		Toton T.M.D.		362L	ZZ	West Hampstead North Jn.	0837½	Cancel
WTT	pass		Gloucester	1	1L00	XC	Stansted Airport	0857½	0857¼
WTT	pass		Stansted Airport	2	1N43	XC	Birmingham New Street	0904	0905¼
WTT	pass		Crewe Bas Hall S.S.M.		FRGT	ZZ	Felixstowe North F.L.T.	0904½	(Q)
WTT	0929	0929½	Birmingham New Street	1	1K07	XC	Leicester	0930	0930¼

[redacted]

WTT	0931	0930¾	Leicester	2	1P08	XC	Birmingham New Street	0931	0931¾
WTT	pass		Birmingham New Street	1	1L34	XC	Stansted Airport	0957½	1003¾
WTT	pass		Stansted Airport	2	1N45	XC	Birmingham New Street	1004	1002½
WTT	pass		Crewe Bas Hall S.S.M.		608Q	ZZ	Mountsorrel Sdgs	1020	Cancel
WTT	1029	1030¾	Birmingham New Street	1	1K09	XC	Leicester	1030	1031½
WTT	1037	1039¾	Leicester	2	1P10	XC	Birmingham New Street	1038	1040¾
WTT	pass		Lawley Street F.L.T.	1	474M	ZZ	Felixstowe North F.L.T.	1049½	1057¼
WTT	pass		Birmingham New Street	1	1L36	XC	Stansted Airport	1057½	1102½
WTT	pass		Stansted Airport	2	1N47	XC	Birmingham New Street	1104	1106¾
WTT	1129	1129¼	Birmingham New Street	1	1K11	XC	Leicester	1130	1130¼
WTT	1136	1142¾	Leicester	2	1P12	XC	Birmingham New Street	1136	1144½
WTT	pass		Birmingham New Street	1	1L38	XC	Stansted Airport	1157½	1202¼
WTT	pass		Stansted Airport	2	1N49	XC	Birmingham New Street	1204	1201¼
STP	pass		Scarborough	2	1Z50	WR	Stratford-upon-Avon	1211	1207
WTT	pass		Corby B.S.C.	2	698P	ZZ	Margam T.C.	1227	1227½
WTT	1230	1229	Birmingham New Street	1	1K13	XC	Leicester (At platform)	1230	1230
WTT	1237	1237	Leicester		1P14	XC	Birmingham New Street	1238	1238
WTT	pass		Banbury Reservoir Rland A		647Q	ZZ	Mountsorrel Sdgs	1238½	Cancel
WTT	pass		Cliffe Hill Stud Farm Gbrf		6G16	ZZ	Bescot Up Engineers Sdgs	1250	1250
WTT	pass		Birmingham New Street		1L40	XC	Stansted Airport	1257½	1300
WTT	pass		Stansted Airport		1N51	XC	Birmingham New Street	1304	1316
WTT	pass		Felixstowe North F.L.T.		404M	ZZ	Crewe Bas Hall S.S.N.	1325½	1325
WTT	1329	1328	Birmingham New Street		1K15	XC	Leicester	1329	1329
WTT	1336	1335	Leicester		1P16	XC	Birmingham New Street	1336	1336
WTT	pass		Eastleigh East Yard		FRGT	ZZ	Cliffe Hill Stud Farm Gbrf	1349½	(Q)
WTT	pass		Mountsorrel Sdgs		FRGT	ZZ	Small Heath Lafarge Aggr	1349½	(Q)
WTT	pass		Mountsorrel Sdgs		FRGT	ZZ	Northampton Castle Yard	1350½	(Q)
WTT	pass		Birmingham New Street		1L42	XC	Stansted Airport	1357½	1357
WTT	pass		Stansted Airport		1N53	XC	Birmingham New Street	1404	1404
VAR	pass		Hams Hall Gbrf		4L22	ZZ	Felixstowe South Gbrf	1424	1424
WTT	1429	1429	Birmingham New Street		1K17	XC	Leicester	1430	1430
VAR	pass		Eastleigh East Yard		FRGT	ZZ	Mountsorell Gbrf	1436½	(Q)
WTT	1437	1437	Leicester		1P18	XC	Birmingham New Street	1438	1438
WTT	pass		Leicester L.I.P.		FRGT	ZZ	Northampton Emd	1446½	1446
WTT	pass		Birmingham New Street		1L44	XC	Stansted Airport	1457½	1457
WTT	pass		Stansted Airport		1N55	XC	Birmingham New Street	1504	1504
WTT	pass		Boston Docks		685Q	ZZ	Washwood Heath Met.Cammel	1523	Cancel
WTT	1529	1528	Birmingham New Street		1K19	XC	Leicester	1530	1530
WTT	1536	1535	Leicester		1P20	XC	Birmingham New Street	1536	1536
WTT	pass		Birmingham New Street		1L46	XC	Stansted Airport	1558½	1558
WTT	pass		Stansted Airport		1N57	XC	Birmingham New Street	1604	1604
WTT	1629	1629	Birmingham New Street		1K21	XC	Leicester	1630	1630
WTT	1637	1637	Leicester		1P22	XC	Birmingham New Street	1638	1638
WTT	1646	1645	Birmingham New Street		1K23	XC	Leicester	1646	1646

VAR	pass		Felixstowe North Gbrf	4M29	ZZ	Birch Coppice Gbrf	1649	1649
WTT	pass		Eastleigh East Yard	FRGT	ZZ	Cliffe Hill Stud Farm Gbrf	1651½	(Q)
WTT	pass		Birmingham New Street	1L48	XC	Stansted Airport	1657½	1657
WTT	pass		Ditton (Oconnor) Fliner	FRGT	ZZ	Felixstowe North F.L.T.	1703½	(Q)
WTT	pass		Stansted Airport	1N59	XC	Birmingham New Street	1704	1704
VAR	pass		Westbury Up T.C.	FRGT	ZZ	Cliffe Hill Stud Farm Gbrf	1717½	(Q)
WTT	**1729**	1728	Birmingham New Street	1L49	XC	Cambridge	**1730**	1730
VAR	pass		Bristol High Level Siding	182P	ZZ	Tyseley L.M.D.	1734½	1734
WTT	**1737**	1737	Leicester	1P24	XC	Birmingham New Street	**1738**	1738
WTT	pass		Bedworth Puma Gbrf	FRGT	ZZ	Immingham Puma Gbrf	1739½	(Q)
WTT	**1747**	1747	Birmingham New Street	1K35	XC	Leicester	**1748**	1748
WTT	**1757**	1756	Birmingham New Street	1L50	XC	Stansted Airport	**1757**	1757
WTT	pass		Felixstowe North F.L.T.	FRGT	ZZ	Lawley Street F.L.T.	1801½	(Q)
WTT	pass		Longport F.D.	FRGT	ZZ	Peterboro Maint Shed Gbrf	1809½	(Q)
WTT	**1808**	1809	Stansted Airport	1N61	XC	Birmingham New Street	**1809**	1810
VAR	pass		Bristol High Level Siding	182P	ZZ	Tyseley L.M.D.	1820½	1820
WTT	**1829**	1829	Birmingham New Street	1K25	XC	Leicester	**1830**	1830
WTT	**1837**	1837	Leicester	1P26	XC	Birmingham New Street	**1838**	1838
WTT	pass		Birmingham New Street	1L52	XC	Stansted Airport	1857½	1857
WTT	pass		Stansted Airport	1N63	XC	Birmingham New Street	1904	1904
WTT	**1929**	1928	Birmingham New Street	1K27	XC	Leicester	**1930**	1930
WTT	**1937**	1937	Leicester	1P28	XC	Birmingham New Street	**1938**	1938
WTT	pass		Lawley Street F.L.T.	FRGT	ZZ	Felixstowe North F.L.T.	1940½	(Q)
WTT	pass		Birmingham New Street	1L54	XC	Stansted Airport	1957½	1957
WTT	pass		Trafford Park F.L.T.	FRGT	ZZ	Felixstowe North F.L.T.	2001½	(Q)
WTT	pass		Stansted Airport	1N65	XC	Birmingham New Street	2004	2004
WTT	**2029**	2029	Birmingham New Street	1K29	XC	Leicester	**2030**	2030
WTT	**2037**	2037	Leicester	1P30	XC	Birmingham New Street	**2038**	2038
WTT	pass		Birmingham New Street	1L56	XC	Cambridge	2059	2059
WTT	pass		Newton Heath T.M.D.	FRGT	ZZ	Leicester L.I.P.	2100	2100
WTT	pass		Stansted Airport	1N67	XC	Birmingham New Street	2104	2104
WTT	pass		Mountsorell Gbrf	FRGT	ZZ	Hinksey Sdgs	2115½	(Q)
WTT	pass		Cliffe Hill Stud Farm Gbrf	FRGT	ZZ	Hinksey Sdgs	2115½	(Q)
WTT	pass		Cliffe Hill Stud Farm Gbrf	FRGT	ZZ	Eastleigh East Yard	2115½	(Q)
VAR	pass		Mountsorell Gbrf	FRGT	ZZ	Eastleigh East Yard	2115½	(Q)
WTT	**2129**	2128	Birmingham New Street	1K31	XC	Leicester	**2130**	2130
WTT	**2135**	2135	Leicester	1P32	XC	Birmingham New Street	**2136**	2136
WTT	pass		Stansted Airport	1N69	XC	Birmingham New Street	2204	2204
WTT	pass		Garston F.L.T.	FRGT	ZZ	Felixstowe North F.L.T.	2216½	(Q)
WTT	pass		Coton Hill Tc Gbrf	FRGT	ZZ	Wellingborough Up Tc Gbrf	2229½	(Q)
WTT	**2246**	2246	Leicester	1P34	XC	Birmingham New Street	**2247**	2247
WTT	**2259**	2258	Birmingham New Street	1K33	XC	Leicester	**2300**	2300
WTT	pass		Stansted Airport	1N71	XC	Birmingham New Street	2309½	2308
VAR	pass		Cliffe Hill Stud Farm Gbrf	FRGT	ZZ	Westbury Up T.C.	2334½	(Q)

VAR	pass	**Wolverton Centre Sidings**	FRGT	ZZ	**Nottingham Eastcroft**	2338	(Q)
VAR	pass	**Felixstowe North F.L.T.**	FRGT	ZZ	**Lawley Street F.L.T.**	2345	(Q)
VAR	pass	**Lawley Street F.L.T.**	FRGT	ZZ	**Felixstowe North F.L.T.**	2346½	(Q)

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Appendix B - Rail terminal trips

Rail terminal trips

	Internal	External
Rail termina	40%	60%

Rail terminal internal trips

Daily trips = 1,680

	AM Peak			PM Peak			Daily		
Vehicle Type	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way
Light vehicles									
HGVs									
Total									

	AM Peak		5.20%	PM Peak		7.30%	Daily		100%
Vehicle Type	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way
Light vehicle	0	0	0	0	0	0	0	0	0
HGVs	17	17	35	25	25	49	336	336	672
Total	17	17	35	25	25	49	336	336	672

Rail terminal external trips

Daily trips = 1,680

	AM Peak			PM Peak			Daily		
Vehicle Type	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way
Light vehicles									
HGVs									
Total									

	AM Peak		5.20%	PM Peak		7.30%	Daily		100%
Vehicle Type	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way
Light vehicle	0	0	0	0	0	0	56	56	112
HGVs	26	26	52	37	37	74	504	504	1008
Total	26	26	52	37	37	74	560	560	1120

Rail terminal total trips

Daily trips = 1,680

	AM Peak			PM Peak			Daily		
Vehicle Type	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way
Light vehicles									
HGVs									
Total									

	AM Peak		5.20%	PM Peak		7.30%	Daily		100%
Vehicle Type	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way
Light vehicle	0	0	0	0	0	0	56	56	112
HGVs	44	44	87	61	61	123	840	840	1680
Total	44	44	87	61	61	123	896	896	1792

Appendix C – B8 warehousing trip rates

B8 Trip Rates - Peak Hour and Daily

Hinckley NRFI 850,000

Daventry International Rail Freight Terminal (DIRFT) - warehousing and intermodal trips

	AM Peak			PM Peak			Daily		
Vehicle Type	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way
Light vehicles	0.088	0.017	0.105	0.056	0.091	0.147	0.718	0.718	1.436
HGVs	0.020	0.022	0.042	0.025	0.030	0.055	0.539	0.539	1.079
Total	0.108	0.039	0.147	0.081	0.121	0.202	1.257	1.257	2.515

	AM Peak			PM Peak			Daily		
Vehicle Type	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way
Light vehicles	748	145	893	476	774	1250	6102	6102	12205
HGVs	170	187	357	213	255	468	4584	4584	9169
Total	918	332	1250	689	1029	1717	10687	10687	21373

West Midlands Interchange

	AM Peak			PM Peak			Daily		
Vehicle Type	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way
Light vehicles	0.072	0.012	0.084	0.040	0.059	0.099	0.834	0.821	1.655
HGVs	0.017	0.016	0.033	0.017	0.022	0.039	0.382	0.366	0.748
Total	0.089	0.028	0.117	0.057	0.081	0.138	1.216	1.187	2.403

	AM Peak			PM Peak			Daily		
Vehicle Type	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way
Light vehicles	612	102	714	340	502	842	7089	6979	14068
HGVs	145	136	281	145	187	332	3247	3111	6358
Total	757	238	995	485	689	1173	10336	10090	20426

East Midlands Gateway

	AM Peak			PM Peak			Daily		
Vehicle Type	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way
Light vehicles	0.121	0.013	0.134	0.029	0.108	0.137	1.060	1.043	2.103
HGVs	0.019	0.023	0.042	0.020	0.024	0.044	0.459	0.475	0.934
Total	0.140	0.036	0.176	0.049	0.132	0.181	1.519	1.518	3.037

	AM Peak			PM Peak			Daily		
Vehicle Type	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way
Light vehicles	1029	111	1139	247	918	1165	9010	8866	17876
HGVs	162	196	357	170	204	374	3902	4038	7939
Total	1190	306	1496	417	1122	1539	12912	12903	25815

Rail Central

	AM Peak			PM Peak			Daily		
Vehicle Type	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way
Light vehicles	0.119	0.013	0.132	0.039	0.137	0.176	1.087	1.070	2.157
HGVs	0.020	0.023	0.043	0.022	0.023	0.045	0.477	0.477	0.953
Total	0.139	0.036	0.176	0.061	0.160	0.221	1.564	1.547	3.111

	AM Peak			PM Peak			Daily		
Vehicle Type	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way
Light vehicles	1014	110	1124	332	1164	1496	9240	9097	18337
HGVs	171	198	368	187	198	384	4052	4052	8104
Total	1185	308	1493	519	1362	1881	13291	13149	26440

Northampton Gateway

	AM Peak			PM Peak			Daily		
Vehicle Type	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way
Light vehicles	0.128	0.014	0.142	0.042	0.147	0.190	1.135	1.117	2.252
HGVs	0.025	0.024	0.049	0.025	0.024	0.049	0.389	0.390	0.778
Total	0.154	0.038	0.191	0.067	0.171	0.239	1.524	1.507	3.030

	AM Peak			PM Peak			Daily		
Vehicle Type	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way
Light vehicles	1091	117	1208	358	1253	1611	9647	9497	19144
HGVs	215	204	419	215	203	418	3303	3311	6615
Total	1306	321	1627	573	1455	2029	12950	12808	25759

Mean average

	AM Peak			PM Peak			Daily		
Vehicle Type	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way
Light vehicles	0.106	0.014	0.119	0.041	0.108	0.150	0.967	0.954	1.921
HGVs	0.020	0.022	0.042	0.022	0.025	0.046	0.449	0.449	0.898
Total	0.126	0.035	0.161	0.063	0.133	0.196	1.416	1.403	2.819

	AM Peak			PM Peak			Daily		
Vehicle Type	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way
Light vehicles	899	117	1016	351	922	1273	8218	8108	16326
HGVs	172	184	356	186	209	395	3818	3819	7637
Total	1071	301	1372	536	1131	1668	12035	11927	23962

Appendix D – Hinckley total trip generation *with* and *without* rail terminal operating

B8 Warehousing trip rates without rail terminal operational

Hinckley NRFI 850,000

Hinckley B8 warehousing

	AM Peak			PM Peak			Daily		
Vehicle Type	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way
Light vehicles	0.106	0.014	0.119	0.041	0.108	0.150	0.967	0.954	1.921
HGVs	0.020	0.022	0.042	0.022	0.025	0.046	0.449	0.449	0.898
Total	0.126	0.035	0.161	0.063	0.133	0.196	1.416	1.403	2.819

	AM Peak			PM Peak			Daily		
Vehicle Type	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way
Light vehicles	899	117	1016	351	922	1273	8218	8108	16326
HGVs	172	184	356	186	209	395	3818	3819	7637
Total	1071	301	1372	536	1131	1668	12035	11927	23962

Rail terminal internal trips

	AM Peak			PM Peak			Daily		
Vehicle Type	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way
Light vehicles									
HGVs									
Total									

	AM Peak			PM Peak			Daily		
Vehicle Type	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way
Light vehicles	0	0	0	0	0	0	0	0	0
HGVs	17	17	35	25	25	49	336	336	672
Total	17	17	35	25	25	49	336	336	672

Combined trips and derived trip rate (back calculated)

	AM Peak			PM Peak			Daily		
Vehicle Type	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way
Light vehicles	0.106	0.014	0.119	0.041	0.108	0.150	0.967	0.954	1.921
HGVs	0.022	0.024	0.046	0.025	0.027	0.052	0.489	0.489	0.978
Total	0.128	0.037	0.166	0.066	0.136	0.202	1.455	1.443	2.898

	AM Peak			PM Peak			Daily		
Vehicle Type	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way
Light vehicles	899	117	1016	351	922	1273	8218	8108	16326
HGVs	190	201	391	210	234	444	4154	4155	8309
Total	1089	318	1407	561	1156	1717	12371	12263	24634

B8 Warehousing trip rates with rail terminal operational

Hinckley NRFI 850,000

Hinckley B8 warehousing

	AM Peak			PM Peak			Daily		
Vehicle Type	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way
Light vehicles	0.106	0.014	0.119	0.041	0.108	0.150	0.967	0.954	1.921
HGVs	0.020	0.022	0.042	0.022	0.025	0.046	0.449	0.449	0.898
Total	0.126	0.035	0.161	0.063	0.133	0.196	1.416	1.403	2.819

	AM Peak			PM Peak			Daily		
Vehicle Type	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way
Light vehicles	899	117	1016	351	922	1273	8218	8108	16326
HGVs	172	184	356	186	209	395	3818	3819	7637
Total	1071	301	1372	536	1131	1668	12035	11927	23962

Rail terminal external trips

	AM Peak			PM Peak			Daily		
Vehicle Type	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way
Light vehicles									
HGVs									
Total									

	AM Peak			PM Peak			Daily		
Vehicle Type	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way
Light vehicles	0	0	0	0	0	0	56	56	112
HGVs	26	26	52	37	37	74	504	504	1008
Total	26	26	52	37	37	74	560	560	1120

Combined trips and derived trip rate (back calculated)

	AM Peak			PM Peak			Daily		
Vehicle Type	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way
Light vehicles	0.106	0.014	0.119	0.041	0.108	0.150	0.973	0.960	1.934
HGVs	0.023	0.025	0.048	0.026	0.029	0.055	0.508	0.509	1.017
Total	0.129	0.038	0.168	0.067	0.137	0.205	1.482	1.469	2.951

	AM Peak			PM Peak			Daily		
Vehicle Type	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way
Light vehicles	899	117	1016	351	922	1273	8274	8164	16438
HGVs	199	210	409	223	246	469	4322	4323	8645
Total	1097	327	1424	573	1168	1741	12595	12487	25082

Appendix B – Baker Rose Derivation Calculation and BWB Clarification Note (HNRFI-BWB-GEN-XX-RP-TP-0021-S2-P01, Rail Freight to HGV Movement HE Response)

HINCKLEY NRFI

INTERMODAL TRAIN TO HGV (off site) and TUG (on site) MOVES

ASSUMPTIONS				
TRAINS PER DAY			16	16
TRAIN UTILISATION			75%	81%
Wagons			Standard	Shortliner
TRAIN LENGTH Metres			775	775
No Wagons/ train			36	50
TEU/Wagon			3	2
TEU Capacity			108	100
Utilisation			75%	81%
Utiliastion TEU/Train			81	81
No trains per day			16	16
INBOUND	Laden	98%	1270	1270
TEU	Reefer	2%	26	26
PER DAY	Empty	0%	0	0
	Total	100%	1296	1296
OUTBOUND	Laden	72%	933	933
TEU	Reefer	2%	26	26
PER DAY	Empty	26%	337	337
		100%	1296	1296
TOTAL	Laden		2203	2203
TEU	Reefer		52	52
PER DAY	Empty		337	337
TEU/DAY	Total		2592	2592

TEU TO CONTAINERS /ILUs	1.8		1.8	
CONTAINERS MOVED PER DAY		1440		1440
HGV & TUG MOVES/ CONTAINER	1.35		1.35	
HGV & TUG MOVES PER WEEKDAY BOTH WAYS @ trains	16	1,944		1,944
HGV/TUG MOVES SATURDAY BOTH WAYS @ trains	4	486		486
TUG MOVEMENTS ON SITE per Weekday average	30%	583		583
HGV MOVEMENTS OFF SITE per Weekday average	70%	1,361		1,361
NET WEEKDAY HGV IMPACT ON THE HIGHWAY v NON RAIL SCHEME		778		778
TUG MOVEMENTS ON SITE per Saturday average	30%	146		146
HGV MOVEMENTS OFF SITE per Saturday average	70%	340		340
NET SATURDAY HGV IMPACT ON THE HIGHWAY v NON RAIL SCHEME		194		194

NOTES

All 20' assumed to be taken as single loads by HGV, not paired.
Some HGVs will arrive loaded and leave loaded; some will be loaded only one way.
The average number of HGV's assumed to be required to move a single container is 1.35
TUG or tractor & trailer unit used, to relcoate contaiers to estate occupiers in lie of HGV move.

IMPORTANT

The Assumed Movements of HGV's will vary according to the split assumed between internal moves, to and from occupiers; and off-site moves to and from the surriounding area. This is a working model, so reflects only the split inserted.

WORKING MODEL dv10

TECHNICAL NOTE

Hinckley National Rail Freight Interchange

Project Name	Hinckley National Rail Freight Interchange		
Document Number	HNRFI-BWB-GEN-XX-RP-TR-0021- Rail Freight to HGV Movement HE Response	BWB Ref	NTT2814
Author	Malcolm Ash	Status	S2
Checked	Shirley Dumigan & David Baker@Baker Rose)	Revision	P2.0
Approved	Shirley Dumigan	Date	03/06/2021

1. Introduction

Highways England Response

1.1 This note is a response to comments from Highways England (HE) provided in relation to the BWB Trip Generation Addendum note (HNFRI-BWB-GEN-XX-RP-TR-0011-S3) produced to inform the PRTM 2.1 modelling process. This related primarily to the derivation of external HGV movements generated by train paths entering the terminal.

1.2 For clarity the relevant comments from HE have been replicated below:

- We have not been able to review the formulas contained in the sheet titled "RAIL TO HGV & TUG MOVES" containing Baker Rose's calculations, as the sheet is password protected;
- Regardless, it appears that the Baker Rose's methodology for calculating the two-way HGV movements per day changed from the previously proposed one. Based on Baker Rose calculations, you have assumed that the number of two-way HGV movements per weekday, when considering 16 paths per weekday, is 1,944. However, assuming that the only difference in the calculation is the number of trains per day, the number of HGV movements per week day would increase proportionally (from 1,680 two-way to 2,239 two-way trips).
- This is also confirmed by the calculation of the Number of HGV movements per weekend day. As the number of weekend trains is unvaried (4), the number of weekend HGV movements should also stay the same (560 two-way trips), as you have assumed in Table 5.2 of your Trip Generation Addendum Note. However, it appears that the Number of HGV movements per weekend day in Baker Rose's spreadsheet equates to 486 two-way trips instead.
- It therefore appears that the new Baker Rose's calculation results in a reduced number of HGV movements per train when compared to the methodology previously agreed.

1.3 The following section sets out the key amendments from Baker Rose for the new assessment and an equivalent derivation of the HGV movements using the previous methodology.

2. Assumptions and Methodology

2.1 The calculations provided by Baker Rose have been refined slightly since the first iteration of the trip generation. The calculations are in line with recent developments in the rail freight industry and as set out by Baker Rose. A linear extrapolation of the original figures will not reproduce the new figures.

2.2 The first model was predicated on physical capacity of the rail equipment only, using older rolling stock, FEA Twins. Each wagon could accommodate 60', theoretically being 1No. 40' container and 1No. 20' container.

2.3 The market is dominated by 40' containers and as such these wagon sets have become increasingly inefficient, with not enough 20' containers to fill the gaps on 60' platforms. This was not reflected in the earlier model.

2.4 The current model is based on new 40'+ wagon platforms, such as Shortliners. The industry is seeking to maximise train loadings, with more 40' containers per train using the newer wagons/rolling stock, in line with demand. So, in effect a higher payload can be moved on a similar length of train, in a smaller number of containers.

2.5 For HGV moves, it is the number of containers moved that is critical. Thus, for every pair of 20's assumed in the original model that is replaced with a single 40' container, the resulting number of HGV moves is halved.

2.6 An increase in the number of trains does not therefore provide a linear progression, because the assumption on the mix of 40' containers and 20's containers that will be carried, has also changed.

2.7 Therefore, there is a difference in HGV movements between the first model, which was a stress test using the technical capacity of older rolling stock, assuming a relatively high number of 20' containers (c33%); to the updated model better reflecting the probable actual outcome, of mostly 40' containers; and a relatively small volume of 20' containers (c11%).

2.8 The conversion factor used of 1.8 TEU (twenty-foot equivalent unit) to containers, reflects this market and is an industry recognised figure.

2.9 The length of train is assumed to operate at maximum length, being up to 775m.

2.10 The updated basis has been validated with the preferred operator.

2.11 The primary differences are as follows:

- The main factor to convert twenty-foot equivalent units (TEUs)[1] into container numbers moved is adjusted from 1.5, being the technical capacity in the original model; to 1.8, better recognising the higher proportion of 40' containers being moved than was possible with the technical capacity of the older rolling stock.
- Which means that the total TEU numbers to containers is reduced. This brings the total containers per train in line with estimates projected for the Northampton Gateway site. This study estimated between 40-50 containers for 750m trains.[2]
- The loading efficiency of use is shown slightly higher, at 81% from 80% previously, both which align with maximum utilisation assumptions on other sites.
- The total capacity per train equates to 100 TEU, up from 96 previously assumed.
- The ratio of off-site/on-site movements have been adjusted from 60/40 to 70/30, increasing the impact on the highway assessment.
- The number of HGV movements required to move each container remains at 1.35[3]

Previous Container to HGV Methodology

2.12 Baker Rose as part of the inputs to the PRTM 1.0 trip generation provided a breakdown of the derivation of the HGV movements. This is summarised below using the previous factors as discussed above.

<u>Previous calculation methodology and Train Paths</u>

- Train length assumed at 686m
- TEU per train (100%)= 96
- Containers per train = 96/1.5 = 64
- Loading Efficiency at 80% = 64*0.8= 52 containers per train
- Inbound and outbound= 52*2= 104 container movements
- HGV movements (in and out)= (1.35* 52)*2 = 140 movements per train
- HGV Movements per day (12 trains) = 140*12 = 1680
- External/internal HGV movements (67/33)[4]= 1126/554

[1] TEU (twenty foot equivalent unit): two most common international standardised containers are those of twenty and forty foot. Depending on whether the train loads twenty or forty-foot containers or a combination of the two, the number of containers held on a train will differ.

So as to express the capacity of a train in a uniform manner, the space that containers can be loaded onto is expressed in the international standard measurement of TEU's, being smallest container size, i.e. those that are twenty foot in length (twenty foot equivalent unit).

[2] Para 6.10.4 'Strategic Freight Network Connectivity and HGV Trip Generation Technical Note' Geoff Bounds Consulting 2016

[3] 'Efficient Intermodal Terminals Deliver Supply Chain Benefits' AECOM for DfT 2010

[4] Adjusted in Hydrock's original trip generation and rounded this to 60/40

Revised Container to HGV Methodology

Revised Factors and Number of Train Paths

- Train length assumed at **775m**
- TEU per train (100%)= **100**
- Containers per train = 100/**1.8** = 55
- Loading Efficiency **81**% = 55*0.81= 45 containers per train
- Inbound and outbound= 45*2= 90 container movements
- HGV movements (in and out)= (1.35* 45)*2 = 122 movements per train
- HGV Movements per day (**16** trains) = 122*16 = 1944
- External/internal (**70/30**)= 1361/583 HGV movements

Weekend Movements

2.13 The original Trip Generation Addendum note had included the previous weekend rates for HGVs. To clarify this should be adjusted to the values put forward by Baker Rose (486) and will be captured in a revision to the Addendum note which will also include this Technical Note for clarification.

3. Summary

3.1 This Technical note provides a response to HE's questions around the derivation of HGV trips from the Hinckley NRFI site.

3.2 A stepped approach to the methodology has been provided, replicating the previous methodology with amended factors. These amended factors bring the vehicle movements more closely in line with other RFI sites within the Midlands and reflect industry-wide figures.

3.3 The specific changes include an adjustment in the maximum train length, ratio of TEUs to containers and a slight change to the handling efficiency of each train. This has in turn reduced the estimated external HGV movements per train as identified in the HE comments.

Appendix C BWB Hydrock Document Review (HNRFI-BWB-GEN-XX-RP-TP-0007-S4-P01)

SYMMETRY PARK

HINCKLEY NRFI

Technical Note

BWB
BETTER SOLUTIONS, INTELLIGENTLY ENGINEERED

Project Name	**Hinckley NRFI,**		
Document Number	HNRFT-BWB-GEN-XX-RP-TR-0007-S4-P01 Review of Approved Documents	BWB Ref	NTT2814
Author	Malcolm Ash	Status	S4
Checked	Shirley Dumigan	Revision	P01
Approved	Shirley Dumigan	Date	17/02/2021

1. Review of Previous Documents

Background

1.2 BWB Consulting (BWB) has agreed to provide a short review of Hydrock documents produced and agreed to date. This forms part of ongoing information exchange and liaison with the Transport Working Group for the Hinckley NRFI site.

1.3 A sign off process was started by Hydrock prior to the project pause at the end of 2019. A small number of documents had received full or tacit sign-off, specifically in relation to the use of the PRTM models, trip generation, phasing and the M69 J2 Base Model VISSIM report. A full table is included below.

1.4 The list of documents only includes those with sign-off. A number had been approved but not fully signed off. From the responses recorded it is Highways England (HE) and Leicestershire County Council (LCC) HDM who have consistently reviewed and advised as they are the respective Highway Authorities for roads around the Hinckley site. Other authorities appear to have been kept informed.

1.5 The majority of the signed off documents relate to initial inputs to the PRTM. AECOM produced the Base Model Reporting and Core Scenario Assumptions which had been approved but not specifically signed off. The trip generation and phasing form the key elements of the Hydrock approved outputs.

1.6 Supporting documents had been provided by Baker Rose and WSP specific to the road traffic impacts from the rail freight interchange alone. This provided further evidence for the Trip Generation Technical note (TR-004-A and C) which will be reviewed in more detail in the following section.

Table1.1 Hydrock Documents Register

Identifier	BIM Ref	Type	Document title	Author	Revision	Date	Latest submission	Status / comments
TR-001		Report	PRTM Base Year Model Review	AECOM	v1.1	27/04/2018		Approved by HE+LCC (Emails 22/11/18)
TR-002		Technical Note	PRTM Core Scenario Assumptions	AECOM	v2	23/04/2018		Approved by HE+LCC (Emails 22/11/18)
TR-004-A	07700-HYD-XX-XX-RP-TP-1003	Technical Note	Trip Generation Report	Hydrock	P08	22/11/2018	22/11/2018	Formally signed off by HE+LCC (Emails 22/11/18 and formally signed 15/08/19 and 19/09/19
TR-004-B	-	Report	Road Traffic Movements	Baker Rose & WSP	v6	16/11/2018	22/11/2018	Approved by HE+LCC appended to Trip Generation Note above.
TR-004-C	07700-HYD-XX-XX-RP-TP-1010	Technical Note	Trip Generation - comparable site analysis	Hydrock	P01	10/11/2018	22/11/2018	Formally signed off by HE+LCC Formally signed 15/08/19 and 19/09/19 respectively.
TR-004-D	07700-HYD-XX-XX-CA-TP-0002	Calculation	Trip Generation - excel	Hydrock	P09	16/11/2018	22/11/2018	Formally signed off by HE+LCC Formally signed 15/08/19 and 19/09/19 respectively.
TR-004-E	07700-HYD-XX-XX-CA-TP-0005	Calculation	Rail terminal daily profiles	Hydrock	P02	09/10/2018	22/11/2018	Formally signed off by HE+LCC Emails 22/11/18 and formally signed 15/08/19 and 19/09/19.
TR-005	07700-HYD-XX-XX-CA-TP-0008	Calculation	Phasing and PRTM modelling years	Hydrock	P01	05/10/2018		Formally signed off by HE+LCC Formally signed 15/08/19 and 19/09/19 respectively.
TR-006-A	-	Model	M69 Junction 2 VISSIM Base Model	Hydrock	V3.0	18/01/2019	21/01/2019	Formally signed off by HE+LCC Formally signed 15/08/19 and 19/09/19 respectively.

Note: TR004-B to E form part of TR004-1A. Trip Generation Report BIM ref 0770-HYD-XX-RP-TP-1003 Revision P08, which was formally signed off in November 2018.

2. AECOM Technical Notes

TR-001 PRTM Base Year Model Review (NRFI – Base Year Review v1.1)

2.1 The document sets out the base year and provides analysis in line with WebTAG guidance. This includes comparison of modelled flows with observed journey time and count data.

2.2 A review of the coded base year network for the M69 Junction 2 and its approaches was undertaken, between the M69 Junction 1 and M69-M1 junction. The review concluded that the coding layout, link lengths, saturation flows, capacities, speed-flow curves and priority rules were within the acceptable limits and consistent with the PRTM coding manual.

2.3 The model performance against observed count data was tested. The modelled flows meet the defined WebTAG criteria for all locations (including the validation locations on the M69), directions, time periods and vehicle types, with the exception of marginal failures for the HGV flows in the AM Peak hour and Interpeak hour on the M69 southbound. Therefore, the performance of the model against traffic flows was suitable for a strategic assessment of the proposed NRFI, given the scale of the marginal count failures.

2.4 Modelled journey times met the WebTAG criteria for both directions and the different time periods. A marginal failure was recorded for the northbound AM, which was primarily driven by the eastbound movement across M1 J21 against the likely commuter movement from the NRFI. Sensitivity tests placing additional delay into the model were used to understand the potential redistributive effects of the marginal failure. It was concluded that the effects would be negligible and unlikely to affect development traffic.

2.5 At the time of production, the report recommended the model was suitable for strategic assessment of the highway network for the purposes of understanding the impact of the NRFI. It also concluded that neither a recalibration of the model nor an update to network coding was required.

2.6 A number of journey time anomalies presented themselves while validating data and these included:

- A46 at Toll Bar End, Coventry;
- A46 Bingham to Farndon, North of Leicester; and
- M6 around Walsall

2.7 Specifically, relevant to the network for HNRFI - During the period of journey time data collection, Toll Bar End had a section of roadworks with a 50 mph limit and likely much lower speeds at peak times. Adding the roadworks into the calibration produced considerable rerouteing, unlikely to be handled correctly by the partial network, and had a significant effect on M69 calibration in Leicestershire.

2.8 To avoid these issues, the link was removed from the journey time route and the model validated as per LLITM with no roadworks represented in the buffer network, to achieve the same calibration in Leicestershire.

TR-002 Core Scenario Assumptions (NRFI Core Scenario Assumptions v2)

2.9 Planning amendments at the time of production were updated in line with PPI LLITM standard modelling changes and checked against latest planning data availability by Hydrock. An additional employment site; Land West of St John's, Enderby was included following discussions held in November 2018.

2.10 The core scenario included strategic sites and infrastructure changes as well as the planning assumptions for the wider AOI and the lists that accompanies this document are provided for information and appended to this review note.

2.11 Reporting indicates factors applied for housing and employment growth for three distinct time scales; 2016-2021, 2016-2026 and 2016-2031. The major developments for each land use are listed and mapped out through a coloured coded scale based on growth forecasts.

2.12 Planning data is subject to change and the assumptions developed at the time were reasonable. This document only set out planning growth assumptions with the LCC area,

3. Hydrock Documentation

TR004 A-E Trip Generation Report and Supporting Evidence. Signed off: HE and LCC; 22.11.18

3.1 Several iterations of the report were provided to the Transport Working Group. The final version is P08 and responded to comments from the stakeholder group. It was approved and 'signed-off' by HE and LCC HDM in November 2018.

3.2 The following text provides BWB's summary and commentary on the suitability of the report for using for the DCO submission.

3.3 **Section 2**: The floorspace used for the NRFI has not changed and remains at 850,000sqm (inclusive of 200,000sqm of mezzanine). A proportion of external rail to road freight movements has been allowed for within the calculations. This remains applicable as a core assumption for the trip generation.

3.4 **Section 3**: Review of relevant planning applications provides a list of comparable sites within the Midlands where rail freight interchange is either proposed, under construction or is in operation. These are:

1. Daventry International Rail Freight Terminal (DIRFT III)
2. West Midlands Interchange
3. East Midlands Gateway
4. Rail Central
5. Northampton Gateway

3.5 The original assumptions included Magna Park Extension and Symmetry Park, neither of which contained a rail freight interchange. Therefore, their respective exclusion is reasonable. Tables 3.1 and 3.2 both indicate good correlation between the proposed site and the reduced list of comparator sites. This includes for location, car ownership, access and size/scale of proposed operation. Both are replicated below for completeness

Table 3.1: Comparable site overview

	Development	Applicant	DCO Application reference	Proposal (B8 element)	Date of TA	Method of trip rate calculation	Rail freight?	Shift timings evident/secured?	Peak hour or daily trip rates?
3	Daventry International Rail Freight Terminal (DIRFT III)	Rugby Radio Station Limited Partnership (RRSLP) and Prologis UK Limited	TR50001 (PINS)	731,000 sqm of rail served storage and distribution floorspace	2013	Traffic surveys of existing DIRFT I and intermodal terminal - 2011	✓	Typical shift timings anticipated, but no restrictions sought from LCC	Peak hour – ES contains AADT
Comments:	DCO application approved | Trip rate source: Table 6.1 (page 75) of Transport Assessment dated February 2013								
4	West Midlands Interchange	Four Ashes Ltd	TR050005 (PINS)	743,200 sqm of rail served warehousing and ancillary service buildings	2017	Traffic surveys of existing DIRFT I and intermodal terminal - 2016	✓	Operation 24 hours per day – typical shift times expected	Peak hour and daily
Comments:	DCO application submitted to PINS August 2018 | Trip rate source: Table 12 (page 87) and Table 16 (page 89) of Transport Assessment dated July 2018								
5	East Midlands Gateway	Roxhill Developments Ltd	TR050002 (PINS)	557,414 sqm of rail served warehousing and ancillary service buildings	2014	Trip rates derived from Swan Valley surveys - 2007	✓	Operation 24 hours per day – typical shift times expected	Peak hour and daily
Comments:	DCO application approved | Trip rate source: Table 6 (page 17) of TN04: Trip Rates and Traffic Generation dated October 2012								
6	Rail Central	Ashfield Land and Gazeley GLP	TR050004 (PINS)	up to 702,097 sqm of rail served storage and distribution floorspace	2018	Trip rates from East Midlands Gateway SRFI and GB Freight Model – in turn East Mids Gateway uses Swan Valley surveys – 2007	✓	Operation 24 hours per day – typical shift times expected	Peak hour and daily
Comments:	DCO application submitted September 2018 | Trip rate source: Table 7.4 (page 63) and Table 7.5 (page 65) of Transport Assessment dated February 2018								
7	Northampton Gateway	Roxhill Developments Ltd	TR050006 (PINS)	Up to 545,500 sqm rail served storage and distribution floor space	2017	Trip rates derived from Swan Valley surveys - 2007	✓	Operation 24 hours per day – typical shift times expected	Peak hour and daily
Comments:	DCO application submitted 21 May 2018 | Trip rate source: Table at paragraph 8.4 (page 20) of TN 02: Trip Generation dated February 2017								

Source: Hydrock

Table 3.2: Comparable site location characteristics

	Development	Planning Region	Location type[1]	Population <1 mile	Population <5 miles	Car ownership <5 miles	Public Transport accessibility (bus and rail)	Pedestrian/Cycle connectivity	Proximity to SRN
*	HINCKLEY NRFI	Leicestershire	Freestanding	2,177	135,767	1.49	Direct public transport services to be provided.	Yes, footway connections proposed connecting to Hinckley	Direct access to M69 J2
3	Daventry International Rail Freight Terminal (DIRFT III)	Northamptonshire	Freestanding[2]	988	85,872	1.37	Bus stops adjacent to the site, proposed bus stops within the site.	Yes, connections to existing footway/cycleway network	Access to M1 J18 via A5 1.9km to the south
4	West Midlands Interchange	Staffordshire	Freestanding[3]	549	126,021	1.36	Bus service adjacent to the site, half-hourly frequency. Shuttle bus service proposed.	Yes, footway/cycleway connections proposed	Access to M6 J12 via A5 0.8km to the east
5	East Midlands Gateway	Leicestershire	Freestanding[4]	2,555	90,398	1.43	Public transport interchange (bus) at site access.	Yes, footway/cycleway connections proposed to Kegworth and East Midlands Airport	Access to M1 J24 via A453 2km to the north
6	Rail Central	Northamptonshire	Freestanding	1,811	139,122	1.43	Bus interchange proposed on site, extension of service and out of hours services to/from Northampton.	Yes, footway/cycleway proposed towards Northampton.	Access to M1 J15A via A43 1.7km to the north
7	Northampton Gateway	Northamptonshire	Freestanding	2,818	140,105	1.43	Dedicated bus service to Northampton proposed, new stops on A508 and extension to existing service.	Yes, footway connection to Northampton over M1 retained, footway cycleway proposed along A508 to Northampton	Access to M1 J15 via A508 0.5km to the north

Source: Hydrock

3.6 **Section 4 Trip Types**: Hydrock identify the core trip types for the NRFI site. These are listed below:

1. Rail freight terminal:

    a. HGV trips internal

    b. HGV trips external

c. Light vehicles (employee/visitor) trips external

2. B8 Warehousing with rail freight terminal operational:

    a. HGV trips internal

    b. HGV trips external

    c. Light vehicles (employee/visitor) trips external

3. B8 Warehousing with rail freight terminal not operational (early phase development)

    a. HGV trips external

    b. Light vehicles (employee/visitor) trips external.

3.7 **Section 5**; Rail Freight Terminal. A summary of the Baker Rose/WSP review is provided and connects several variables into the trip generation assumptions for the Rail Terminal. These include: Track Capacity, Track Utilisation, Installed Crane Capacity, Container storage capacity, Train length Operating days per annum and Operating efficiency.

3.8 A derivation of the average HGV trips using container arrivals, HGV numbers per train annual rates and operational peaks is provided. All follow logically and are traced back to evidence on rail freight movement provided by Baker Rose/WSP.

3.9 The derivation of a daily profile of HGV movement and the PM peak hours along with additional light traffic has been derived from a previous study by AECOM which relied upon a survey from Hams Hall Rail Terminal. This site is similar in rail movements to the proposed site with circa 10 trains per day.

3.10 Rail terminal staff/visitor numbers have been taken from the Baker Rose/WSP analysis for light vehicles. The combination of the above data is presented in the Table 5.6 extract below.

Table 5.6: Rail freight terminal total trip generation (maximum)

	AM Peak (0800 – 0900)			PM Peak (1700 – 1800)			Daily (24 hour)		
	Arrival	Departure	Total	Arrival	Departure	Total	Arrival	Departure	Total
LGV's	0	0	0	0	0	0	56	56	112
HGV's	44	44	87	61	61	123	840	840	1,680
Total	44	44	87	61	61	123	896	896	1,792

Source: Hydrock

3.11 The approach is robust as an initial assessment of the HGV derivation. The report continues in Section 6 with derivation of internalisation from the Baker Rose/WSP report. Core to the overall assumption is the 60/40 split in favour of external trips from the rail freight terminal. This appears to be based on similar sites and professional judgement on behalf of the Baker Rose/WSP team. The traffic generation report projected train numbers expected to stop at Hinckley NRFI being 12 trains per day weekday and 4 trains per day during weekends. Intermodality and train movements are subject to agreement with Network Rail and will form part of the generation informing the PRTM 2.1 model brief and any subsequent update to the Traffic generation technical note.

3.12 Further discussions with the client team and Baker Rose have reached the conclusion that an allowance for 16 train paths per weekday is to be the revised number for the PRTM 2.1. This is based on similar numbers for Northampton Gateway and West Midlands Interchange and feedback from potential operators and Network Rail. A revised external/internal split of HGV movements has been set at 70/30 which aligns with similar open access Terminal sites in the Midlands. The updated trip generation is included with this note (Appendix A).

3.13 **Section 7** reviews the B8 Warehousing Trip Generation with Rail Freight in operation. Hydrock referenced back to the original five sites highlighted in Paragraph 3.4 and trip rates extracted from each of the respective Transport Assessments. A commentary on each site is included.

3.14 Both DIRFT III and West Midlands Interchange rely on comprehensive surveys at DIRFT in 2011 and 2016 respectively. These were then used to derive factors based on a 100sqm of floorspace. This presents a reasonable methodology.

3.15 East Midlands Gateway assessment relied upon older surveys from Swan Valley (2007), which arguably are dated, but the rates correlate reasonably well with the other sites. Though light vehicles rates are slightly higher.

3.16 The Rail Central assessment adopted a similar approach to the methodology being discussed by Hydrock within their document. A review of similar sites including DIRFT III, East Midlands Gateway and Radlett SRFI. This again produced results which broadly align with other assessment approaches.

3.17 Finally, the Northampton Gateway assessment followed a similar approach to the sites above, using up to 12 B8 sites used to correlate to the average results. The Swan Valley site was referenced for light vehicles specifically as they were well above the average for the twelve sites. They therefore presented the most robust analysis, though HGV results were lower and therefore the average of the other sites was used. Again, this is a reasonable approach to trip rate derivation.

3.18 A discussion on disaggregation of light vehicle trips concludes section 7. None of the studied sites allow for disaggregation between employee light vehicle trips and operational trips. It is concluded that the light vehicle rates allow for an element of commercial movements within their rates and that during peak times, these will be a small proportion of movements. This methodology would seem reasonable and aligns with sites that have been through the similar DCO process.

3.19 **Section 8** allows for a phased approach, considering the site without the Rail Interchange. The calculation by Hydrock relies on combining the internal trips derived from the Rail Freight Terminal trips with the B8 Averages derived from the five other RFI sites. Should the rail terminal not become operational earlier in the site development, this methodology would be highly robust, potentially over-estimating HGV traffic from the site. This is because it assumes replacement of the terminal land with equivalent B8 units. This is not planned and would therefore only be a hypothetical comparator.

3.20 **Section 9** concludes the report with an overarching set of trip generation figures for the site allowing for external trips from the Rail Freight terminal and B8 land uses. The B8 rates are reasonable as the development has not changed in the scope of its size and land uses. One point of note is that the 'LGVs' listed below cover all light vehicles, not just light goods vehicles. Refer to paragraph 3.15.

Table 9.1: Hinckley NRFI combined trip generation (B8 warehousing 850,000sqm and the rail freight terminal external trip generation)

	AM Peak (0800 – 0900)			PM Peak (1700 – 1800)			Daily (24 hour)		
	Arrival	Departure	Total	Arrival	Departure	Total	Arrival	Departure	Total
LGV's	899	117	1,016	351	922	1,273	8,274	8,164	16,438
HGV's	199	210	409	223	246	469	4,322	4,323	8,645
Total	1,097	327	1,424	573	1,168	1,741	12,595	12,487	25,082

Source: Hydrock

3.21 Table 3.1 below includes the amended information on train paths (16 No.). A Factor of 1.35 for number of HGV movements to containers has been included, which is derived from similar sites across the UK. This along with the revised external/internal split of 70/30 has raised the number of HGVs leaving the site slightly in the peak hours and across the 24 hour period. See spreadsheet attached.

Table 3.1 Hinckley NRFI Combined Trip Generation (B8 and Rail Freight Terminal External Trip Generation

	AM Peak			PM Peak			Daily		
Vehicle Type	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way
Light vehicles	899	117	1,016	351	922	1,273	8,274	8,164	16,438
HGVs	208	219	427	235	259	494	4,498	4,500	8,998
Total	1,106	336	1,443	586	1,181	1,767	12,772	12,664	25,435

Source: Baker Rose/BWB

Supporting Documentation

3.22 A series of appendices which include the Baker Rose/WSP report and calculations to derive the trip rates and tables presented in the main body of the report. These are referenced in Table 1.1 as TR-004 B-E.

3.23 Use of daily profiles at Hams Hall, although not specifically referenced by Hydrock was traced to: Efficient Intermodal Terminals Deliver Supply Chain Benefits: AECOM for Department for Transport December 2010.

3.24 The calculations have been reviewed and they correspond with the conclusions within the report as per the commentary above.

TR-005 Phasing and PRTM Modelling Years; Signed off: HE and LCC; 05.10.18

3.25 A one-page document produced by Hydrock with projected build out estimates is included within the agreed documents. This confirms opening year as 2026 and future projected horizon year as 2036 (10 years), as per Circular 02/13 (HE). Despite delays since the production of the original note, 2026 remains the target opening year as confirmed by Tritax January 2021 and therefore this document remains valid.

TR-006 M69 Junction 2 VISSIM Modelling 21.01.19

3.26 A full review of the M69 Junction 2 VISSIM Base model has been carried out by the BWB micro-simulation team. This is included on the BWB Sharepoint file: **HNRFI-BWB-GEN-XX-RP-TR-0005-S4-P01**. Some discrepancies were noted and have been amended within the newer version of the **model and updated LMVR issued** to the working group on the 5th of January 2021 for approval alongside the base model and report for M69 J1 **(HNRFI-BWB-GEN-XX-RP-TR-0004-S4-P01)**.

TR-010-A Forecast Modelling Run; AECOM TN3 (Formal Runs April 2019)

3.27 Forecast modelling reports were produced by AECOM in April 2019. This is referred to by AECOM as TN3 and is listed as information only by Hydrock.

3.28 In addition to the documents provided for approval as discussed above, separate technical notes were produced by AECOM in support of model runs provided under the PRTM 1.0. This included for the 'Formal Run'- TN 3 and the additional test runs 'A47 Link'- TN4 and additional to the A47 link road, Eastern Village Bypass options A and B in TN5 .

3.29 Key items to note in the formal run includes update to the core scenario assumptions to include the Kirkby Muxloe, DPD Site east of M69 J1, Magna and Symmetry Park development. It also includes and updates to the Green Book in 2019 as well as an update to planning assumptions (including Warwickshire) following review by the working group.

3.30 Both documents set out the parameters of the runs, including the scenarios. For the 'Formal Run' this included the development and south facing slips against the base scenarios and for the A47 Link this included a scenario with the link road in place in tandem with the Formal Run scenarios.

3.31 The documents provide summary outputs from the PRTM. This included flow Change diagram comparisons, forecast delay and ratio of flow to capacity. Though no conclusions or recommendations are drawn by the reports, the changes between the scenarios is well represented by the graphical images. This has helped to inform our work on understanding the impacts on the Eastern Villages. Though raw data was referenced for further detailed analysis.

TR 025 Furnessing Methodology

3.32 A Furnessing methodology was proposed and amended a number of times. The final version incorporated comments from HE and LCC related specifically to an alternative methodology.

3.33 The preferred methodology (Option 3) was the interpolation and application of absolute growth to observed base trip ends. This has allowed for the number of trips to converge.

3.34 This method along with the second option created the need for trip end balancing due to the disproportionate increase/reduction for each set of targets. However, the degree of imbalance in Option 3 was negligible or non-existent, giving further credibility to the method and added confidence in its suitability. Nevertheless, trip end balancing was undertaken to eliminate any imbalances if/when they occur.

3.35 Correspondence had been received by Hydrock following the amended note and third option, noting the general acceptance of the approach from HE's consultants and LCC.

3.36 This methodology has been taken forward by the BWB in the Furnessing analysis issued to the working group dated on the 4th of December 2020 for review and comment.

4. Conclusion

3.37 BWB have reviewed the various documents produced by AECOM that set out the PRTM including the LMVR, Base Year Review, Core Assumptions set out in 2018 and updated in the formal runs in 2019, trip distribution and forecast modelling Formal Run in 2019 and option testing for the A47 link road and Eastern Village Bypass option. Except for reviewing the A46 coding around Stivichall Interchange no changes are expected. It is expected that some further amendment will be discussed as part of the inception meeting to produce the PRTM 2.1 model runs.

3.38 Additionally, the Traffic Generation Technical Note that Hydrock produced BIM Ref: 07700-HYD-XX-XX-RP-TP-1003-P08_S4 with the supporting documents sets out a reasonable and robust approach to calculating the traffic generation associated with the Rail Terminal and the B8 site. This was previously signed off formally by both LCC and HE.

3.39 Using the methodology established, BWB has updated the trip generation results using revised external/internal rail terminal HGV trips along with new figures for anticipated train paths servicing the site. These are set out in the amended trip generation spreadsheet.

APPENDICES

APPENDIX 1: Updated Trip Generation Spreadsheet

Appendix D Baker Rose Technical Note 1; Railport Generation of HGV Movements to and from the Public Highway.

CONSULTING

PROPERTY TRANSPORT INVESTMENT DEVELOPMENT

TECHNICAL NOTE

SCHEME	HINCKLEY NATIONAL RAIL FREIGHT TERMINAL
PROMOTER	TRITAX SYMMETRY (HINCKLEY) LTD
REGARDING	RAILPORT GENERATION OF HGV MOVES TO AND FROM THE PUBLIC HIGHWAY
DATE	13th September 2021

1 BACKGROUND

1.1 This Technical Note has been prepared to explain the assumptions behind the daily number of Heavy Goods Vehicles ('HGVs') coming from and going to the Railport at the proposed Hinckley National Rail Freight Terminal ('HNRFI').

1.2 The assumptions made have been designed to provide a robust assessment for highway traffic modelling. This is in order that there can be confidence in the assessment of possible impacts on the highway network, when added to the HGV moves generated by the occupiers of buildings on site.

1.4 This Technical Note explains these assumptions and what has driven them.

1.5 HNRFI will have a physical capacity to handle up to 16 intermodal trains per day at a maximum, length of 775m.

2 INTERMODAL LOADING UNITS / ILU / CONTAINERS

2.1 The most common intermodal loading unit (ILU) is the steel box container. These were originally designed to make the loading and unloading of internationally shipped goods and materials simple and efficient, particularly to move between different modes of transport to and from a port's hinterland.

2.2 Each container has lifting points to enable it to be moved between different modes of transport. Ports charge for each lift regardless of the size of the container.

2.3 A container is an intermodal loading unit / ILU, and the descriptions of container / ILU are interchangeable for the purposes of this Note.

2.4 The containers come in different heights (8ft, 8ftin and 9ft6in) and different lengths, primarily 20ft, 40ft and 45ft.

3 TWENTY-FOOT EQUIVALENT UNIT / TEU

3.1 The smallest container at 20ft is used as the base unit size, and everything is then assessed around the twenty-foot equivalent unit (TEU) measurement. This international standard of measurement enables shipping lines, ports and road / rail managers to assess the capacity and utilisation of a particular facility or piece of equipment.

3.2 Thus the most common container in use at 40ft, equates to 2 TEU's.

3.3. We have referred to 40ft+ where the equipment can handle 40ft and 45ft containers.

4. THE INTERMODAL MOVE

4.1 Ports, whether coastal or an inland Railport, will charge customers per lift made. Road hauliers likewise will charge per move based on time and distance.

4.2 Two twenty-foot laden containers cannot go onto a single road trailer, because the doors of one would be blocked and inaccessible, so they have to be carried singularly. Empty containers can be mounted in pairs, but for the purpose of this assessment we have assumed a worst case scenario that all containers would be moved on their own.

4.3 Commercialy the lift and land transportation cost for a 20ft container is potentially double that of a 40ft container as the cost to move a 20ft container is generally the same as the accepted cost to move a 40ft container. Accordingly, 20ft containers are not a significant volume of the total containers moved as their use is not normally economical.

4.4 The rail freight rolling stock to take containers has traditionally been based on 60ft long platforms (at 3 TEU) to accommodate one 40ft and one 20ft container, or three 20ft containers.

4.5 As an example 6 x 60ft platforms, at 360ft total length (18 TEU), could only accommodate 6 x 40ft containers (12 TEU). The other 4 TEU could only be filled with individual 20ft containers, where available.

4.6 In practice, because of the economics, there has been a dearth of 20ft containers used meaning that there have been many 20ft gaps on trains i.e., in practice freight trains generally do not have all container slots occupied when making a journey due to the economic inefficiencies of using 20ft containers. This way of loading freight trains reduces the efficiency of the trains, in terms of income and costs, with greater turbulence requiring more fuel.

4.7 Since 2012 increasing investment has been going into wagons combining the new 40ft+ platforms to accommodate 40ft, 45ft and 2x20ft containers on each wagon, closely coupled in sets to minimise drag from empty spaces.

4.8 These VTG Ecofret wagons, also referred to as Shortliners, allow train operators much more flexibility in loading and better and efficient overall space utilisation of the wagon platforms.

5. UTILISATION

5.1 Utilisation relates to the extent to which the capacity of the wagons is utilised for containers in each move.

5.2 In addition to the inefficiencies of the older 60ft platforms, outbound / return to port loading can often be expected to be smaller than the inbound. This is because containers delivering off site, may be routed to pick up loads nearer a seaport than an inland terminal, so get returned by road, not rail.

5.3 However for the purpose of this assessment, we have adopted the assumption that every container that comes in by rail will depart by rail i.e. the container will come in by ral, leave by road to then come back by road to the railport and depart back to the seaport by rail.

5.4 In terms of train utilisation, the level of efficiency will also change from days of the week (peaking on Wednesdays), to train routing and pathing times (whether there is enough time to fully load trains), loading configurations (too heavy means less containers) and shortages of empties.

5.5 This means that there are many reasons why on average, the train loadings could and indeed are below optimal use. The normal level will be between 60 - 80%. Of two major operators, one operates at a maximum of c70%, the other has achieved c80%.

5.6 For the purpose of this assessment, we have maximised the number of new format train wagon platforms assumed at 50. It is likely to be 48 as they are currently being manufactured in sets of three,

5.7 We tested this against a notional full use of a traditional wagon set, fully utilised, at 75% max, at full 775m and compared this to the new equipment at 50 wagons and established a maximum utilisation of 81%.

5.8 This is also in line with the well-established Pareto efficiency assumption used in logistics (amongst other areas), that beyond 80% utilisation starts to result in diminishing efficiencies and increased failures.

6. ASSESSMENT OF CONTAINERS TO TEU CAPACITY

6.1 As per so much port related data, capacity is referred to in the number of TEU's lifted or accommodated. If all the containers were 40ft containers, then the number of TEU to actual containers would be 2, half the number of TEU's.

6.2 Under advisement of an operator we have considered the much higher proportion of 40+ft containers that will be lifted compared to 20ft containers with the benefit of the new rail wagons; and taken an assessment based on a pragmatic factor of 1.8 TEU's to containers to be moved, rather than 2.

6.3 At 11% of all moves for 20ft containers, this is seen as realistic, particularly for off-site moves, given the proportionately high (double) cost of lifting and onward transportation and return. Overall shippers are moving to bigger, not smaller containers and the rail freight operators will in the future be able to load more 40ft+ containers per train than currently, especially given the greater prevalence of 775m length trains

7. OFF-SITE & ON-SITE RAILPORT RELATED HGV MOVES

7.1 We have considered the common evidence used in several consented SRFI schemes, including DIRFT III, East Midlands Gateway and Northampton Gateway, all of which have been in the public domain.

7.2 In the 2010 research for DIRFT, which is recognised as a fully integrated rail and distribution park offering to the market (and for which the author was responsible for the very original scheme needs case), the conclusion as set out in the appended schedule (Appendix 1) is that 44% of products were going off site to other locations; and 56% were being handled through the warehouses on site.

7.3 In the assessment of Hams Hall (an entirely open access railport) (Appendix 2) it identifies a split of 60% off site and 40% on site. We would attribute this difference to a higher volume of heavy industrial products going through Hams Hall, to service the wider industrial base in the region, compared to the fast-moving consumer good base at DIRFT for national distribution, typically going through the onsite dedicated rail terminals adjoining the warehouses of Tesco and Sainsburys as well as the open access railport managed by WH Malcom. This is entirely in line with the market split anticipated by Baker Rose when both the schemes were originally proposed and consented.

7.4 We originally assessed this scheme on the basis of 40% of containers staying on site and 60% going off site to the surrounding region, in line with other cases. However, in the current assessment, a higher percentage of HGV moves going off site, at 70% is assumed.

7.5 This is to ensure the testing of highway impacts is robust and allows for an assumption that there might be a relocation of some flows from existing terminals to better serve the local market; reducing delivery lorry miles further.

8. HGV MOVES PER CONTAINER

8.1 As above we have considered the data used in other consented schemes, engaged with operators and taken into account the background to the survey data and changes occurring in the logistics market.

8.2 Containers have to be loaded and transported on road with special trailers, with locking systems to secure them. They can't transport anything else with this trailer. Therefore, for a haulier the most efficient and cost-effective trip is to take a container in and depart with a new container. At the deep-sea ports this is the norm, with a ratio of 1 HGV running loaded each way with a container.

8.3 In 2010 the Department for Transport published 'Efficient Intermodal Terminals Delivery Supply Chain Benefits'. For this AECOM had done a comparison of survey data at DIRFT and Hams Hall (see Appendix 3). This identified that there were more vehicles movements in and out of the terminals then there were containers moved. Some HGV's would arrive with a container and leave empty, or vice versa.

8.4 The utilisation of HGV's in the survey data showed DIRFT at 1.29 HGV moves per container; and Hams Hall at 1.4 (average 1.34). The figure of 1.35 moves per container has as a result been adopted as a recognised factor.

8.5 DIRFT had pioneered the use of IT booking and storage systems from the outset, as it was established by a logistics business with a strong retail customer base at the time, including Sainsburys. Hams Hall by comparison was operated by a ports business. Terminal operators are developing and utilising increasingly sophisticated booking systems to ensure that HGV's can arrive and depart efficiently and be utilised to best advantage. The 2010 DfT study was in part to encourage this.

8.6 The cost of the hinterland move is relatively expensive and particularly so if the HGV only travels one way with a container. The 1.35 HGV moves per container metric means 35% more HGV moves required at an inland terminal, compared to a deep-sea port.

8.7 Given the green and zero carbon agenda to minimise empty running, costs of fuel and the shortage of drivers, the pressure on haulage businesses and terminals will be to maximise the use of HGV's to get the utilisation closer to 1 HGV loaded both ways, as seen at deep-sea ports.

8.8 Our expectation is that the actual number of moves per container will therefore be considerably below 1.35. However, to ensure a robust HGV assessment, we have used 1.35 for the projected assessment at HNRFI.

9. EXPRESS FREIGHT & RAIL TO BUILDINGS

9.1 The buildings have been assessed as creating road only traffic, but with an allowance of 30% of the railports intermodal movements replacing HGV movements that would otherwise have come via the highway network.

9.2 HNRFI can deliver rail connected and rail served buildings., The use of rail linked buildings will further replace and improve the position on road traffic set out in 9.1. Consequently, there would be an overall reduction in HGV impacts regionally.

9.3 HNRFI provides for express freight services to be delivered if required.

9.4 We have discussed the prospects for express freight services with promoters, but from a logistics perspective, do not see that these could be viable for off-site businesses to readily use. The time and cost of at least double handling roller cages between the dispatch origin, moved by road and then handled again to load onto an express rail service, would likely frustrate the viability and time benefits of the service.

9.5 Express freight and rail into buildings if taken up is therefore expected to further reduce the impact on the highway network, not increase it.

10. CONCLUSION

10.1 The assessment we have made and the assumptions used to establish a daily flow of HGV's has been designed to be robust and is based on maximum probable numbers, with every commercial and logistical likelihood that they will transpire to be less.

10.2 The maximum length of train ever achievable within Network Rail's maximum of 775m has been used, assuming 81% utilisation, with 1.8 TEU to container conversion factor, i.e., c90% 40ft+containers on the new more efficient platforms, the balance as 20ft containers.

10.3 The percentage of containers assumed to be moved to surrounding areas, off site, via the highway network is 70%, rather than 60% as used by others and previously.

10.4 The number of HGV's assumed required to drop and collect a container, on average, at 1.35, when deep-sea ports experience is nearer 1. The environmental agenda, financial pressure, shortage of drivers and improved IT booking systems are expected to reduce this number, making it a robust factor for use.

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APPENDIX 1

DIRFT	ON & OFF SITE TRIP GENERATION SPLIT 2010		
Origin / Destination	Trains each way per weekday	Operator / customer	Relationship to DIRFT
Southampton	0.6	Freightliner	Most products distributed to/from surrounding area
Tilbury	1	Freightliner	Most products distributed to/from surrounding area
Novara	1	Norfolk Line	Most products distributed to/from surrounding area
Coatbridge	1	Russell Group	Most products distributed to/from surrounding area
Purfleet	2	Russell Group	Most products distributed to/from surrounding area
Evian	2	Malcolm Group	Most products handled through warehouses at DIRFT
Grangemouth	1	Malcolm Group	Most products handled through warehouses at DIRFT
Mossend	1	Malcolm Group	Most products handled through warehouses at DIRFT
Mossend	1	Tesco / Stobart	Most products handled through warehouses at DIRFT
Wentloog	1	Tesco / Stobart	Most products handled through warehouses at DIRFT
Tilbury	1	Tesco / Stobart	Most products handled through warehouses at DIRFT
Total	12.6		
of which	5.6	**44%**	**Most products distributed to/from surrounding area**
	7.0	**56%**	**Most products handled through warehouses at DIRFT**

Source:
DIRFT III - referenced Northampton Gateway DCO - Technical Note 2 Trip Generation

APPENDIX 2

HAMS HALL ON & OFF SITE TRIP GENERATION SPLIT 2010

Time window	HGV arrivals at Hams Hall							
	Mon 01/02/2010	Tue 02/02/2010	Wed 03/02/2010	Thu 04/02/2010	Fri 05/02/2010	Sat 06/02/2010	Average M-F	Arrival as %
00:00	0	0	0	2	2	0	0.8	0.22%
01:00	0	3	3	1	0	0	1.4	0.39%
02:00	0	0	3	1	3	5	1.4	0.39%
03:00	0	2	1	1	1	0	1	0.28%
04:00	0	8	4	2	0	1	2.8	0.78%
05:00	0	22	6	12	7	0	9.4	2.61%
06:00	32	27	16	18	16	1	21.8	6.05%
07:00	35	20	34	30	25	5	28.8	7.99%
08:00	20	20	23	11	19	4	18.6	5.16%
09:00	27	16	22	16	11	2	18.4	5.11%
10:00	27	27	33	21	20	4	25.6	7.10%
11:00	25	18	24	25	29	2	24.2	6.71%
12:00	34	34	30	34	28	5	32	8.88%
13:00	30	25	26	22	26	2	25.8	7.16%
14:00	14	22	23	18	15	1	18.4	5.11%
15:00	34	23	18	27	26		25.6	7.10%
16:00	33	18	33	34	26		28.8	7.99%
17:00	33	24	23	28	24		26.4	7.33%
18:00	33	16	24	21	28		24.4	6.77%
19:00	31	8	11	8	15		14.6	4.05%
20:00	5	8	12	3	1		5.8	1.61%
21:00	4	2	5	1	1		2.6	0.72%
22:00	4	1	0	1	0		1.2	0.33%
23:00	0	2	1	0	0		0.6	0.17%
Total	421	346	375	337	323	32	360.4	100%

Rail Terminal** HGV trips (in isolation) i.e. 100%		
Arrive	Depart	Two-way
2	2	4
4	4	8
4	4	8
3	3	5
8	8	15
25	25	51
59	59	117
77	77	155
50	50	100
49	49	99
69	69	138
65	65	130
86	86	172
69	69	139
49	49	99
69	69	138
77	77	155
71	71	142
66	66	131
39	39	79
16	16	31
7	7	14
3	3	6
2	2	3
969	**969**	**1938**

Note: The hourly number totals have been rounded in Excel

Rail Terminal external HGV trips 60% external		
Arrive	Depart	Two-way
1	1	3
2	2	5
2	2	5
2	2	3
5	5	9
15	15	30
35	35	70
46	46	93
30	30	60
30	30	59
41	41	83
39	39	78
52	52	103
42	42	83
30	30	59
41	41	83
46	46	93
43	43	85
39	39	79
24	24	47
9	9	19
4	4	8
2	2	4
1	1	2
581	**581**	**1163**

Note: The hourly number totals have been rounded in Excel

Source:
HGV movements associated with Intermodal Terminal - Northampton Gateway DCO - Trip Generation

APPENDIX 3

Efficient Intermodal Terminals Deliver Supply Chain Benefits:
AECOM for Department for Transport Dec 2010

Intermodal Terminal Year	DIRFT 2006	Hams Hall 2010
Observed intermodal trains per day each way		
Deep Sea	2	6
Domestic	4	1
Channel Tunnel	1	1
Total per day	**7**	**8**
Estimated containers per train each way		
Deep Sea	26	33
Domestic	20	30
Channel Tunnel	30	30
Total per day (total of both directions)	**324**	**516**
Observed HGV movements per day		
HGVs arriving at site gatehouse per day	209	360
Total 2-way HGV trips per day (total arrivals and departures)	418	720
Ratio of HGV trips to containers handled	**1.29**	**1.4**

Sources:

Observed intermodal trains per day each way

Train information sources from Working Timetable data via Freightmaster publications

Estimated containers per train each way

Container information sourced from Freight Operating Company(s) and/or lineside observations

Observed HGV movements per day

HGV traffic data sourced from gatehouse records

Appendix E Baker Rose Technical Note 2; Further Clarifications in Response to HBBC comments.

Baker Rose
CONSULTING

PROPERTY TRANSPORT INVESTMENT DEVELOPMENT

TECHNICAL NOTE

RESPONSE TO QUERIES

SCHEME HINCKLEY NATIONAL RAIL FREIGHT TERMINAL

PROMOTER TRITAX SYMMETRY (HINCKLEY) LTD

REGARDING RAILPORT GENERATION OF HGV MOVES TO AND FROM THE PUBLIC HIGHWAY

Response to Atholl Noon,
Director Transport Planning and Engineering
Hinckley & Bosworth Borough Council

DATE 20th September 2021

1 BACKGROUND

1.1 This response is in answer to questions raised on the Technical Note regarding the HNRFI railport generation of HGV moves to and from the public highway, dated 13th September 2021.

1.2 The questions raised, and their respective answers are set out below.

2. Q&A

Q1. 3.1 what is the height assumed for a TEU (2 diff heights are given)

A1. The three international standard container heights are 8ft, 8ft 6in and 9ft 6in (see 2.4).

There have been no assumptions made as to container heights in relation to road movements, as there is no difference in the number of movements because of height (see also answer to Q6 below).

Q2. 4.7 refers to a 45ft container, but this is not referred to in para 3?

A2. 45ft containers can be carried on either 60' platforms (with 15' gaps) or dedicated wagons such as 'low liners' for route specific uses. They are not as efficient to move by rail as a result, but this could change with new wagon developments in the future if demand required.

45ft containers are more commonly used for short sea / European flows, to attempt to compete with the capacity of road-based articulated HGV and trailer units.

20ft and 40ft containers are standard deep sea shipping containers and the core intermodal volume moved by rail.

Q3. 5.6 – couldn't quite understand this – no length info given for shortliners, so hard to judge in 775m train length whether 50 or 48 should be used?

A3. The new format wagons are based on VTG's Ecofret platform, each capable of taking 1 40' or 2 20' containers. Freightliner's Shortliner versions are in close coupled pairs, whereas GB Railfreight's are configured in triple platform sets. Thus both 50 and 48 platform configurations are possible. We adopted 50.

Q4. 5.7 it wasn't quite clear to me where the 80% utilisation was derived from – is this based on the industry practice. or some other calc?

A4 Utilisation differs on routes, between operators and between loaded and empty returns. In discussion with operators, we modelled a maximum probable actual flow, rather than an average, at c80% (81% because of the configuration of the newer wagons). We used this maximum probable actual for all moves to stress test the highway model.

Q5. 9.1 – seems to refer to a factor of a 30% reduction in HGV movements associated with the B8 buildings for inter-modal freight? I wasn't aware this had been applied to your B8 trip generation, can you confirm please?

A5. The 30% only applies to the rail terminal HGV movements. For robustness BWB have retained the B8 trip rate for the whole site GFA (850k sqm), with no discounting and added the off-site rail terminal trips to these.

Q6. Can the consultant also please provide information on high HGV's (A5 low bridge issue) and how this relates to container movement and fleet proportions?

A6. The maximum height for a 9ft 6" container on a standard road trailer would be 14ft 6in (4.42m). The A5 bridge at Nuneaton has a height restriction of 4.6m, so all container movements can use this route without fouling the bridge. Accordingly, no fleet proportions between the different height containers are required for road moves.

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