HS2

Woore Traffic Surveys, August 2018

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Rev02	Bob Flynn	12/10/18	For issue
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1 Introduction

1.1.1 Arup have been commissioned by HS2 to undertake a series of traffic surveys in and around the village of Woore in Shropshire. Representatives from Woore Parish Council have previously questioned the validity of the traffic data used in the Environmental Statement (2017). In the recent High Speed Rail Bill Select Committee hearing, dated the 21st May 2018, the Chairman of Woore Parish Council, Mr Cowey, stated *that the winter traffic surveys failed to take into account heavy spring, summer and autumn traffic generated by Bridgemere Garden World,* page 31, paragraph 295. Select Committee have requested reassurance on the validity of the traffic figures in and around Woore and consequently HS2 have committed to undertaking further traffic surveys.

1.1.2 This technical note sets out to summarise the traffic survey data, compare both surveys and provide answers to the question over the validity of the Environmental Statement (2017) 2016 surveys.

1.1.3 This remainder of this technical note is set out as follows:

- Traffic survey guidance;
- Brief explanation of Average Daily Traffic, Annual Average Daily Traffic and seasonality factors;
- Traffic surveys;
- Traffic flow data summary and analysis;
- Further analysis
- Traffic speed data; and
- Summary and conclusions.

2 Traffic Survey Guidance

2.1.1 The timing of traffic surveys commissioned by HS2 as part of the environmental assessment generally adhere to guidelines set out by the Department for Transport. Transport Analysis Guidance Unit M1.2 Data Sources and Surveys, paragraph 3.3.6 states:

Surveys should be carried out during a 'neutral', or representative month avoiding main and local holiday periods, local school holidays and half terms and other abnormal traffic periods.

2.1.2 Neutral months are March and April (excluding Easter) May, June, September (excluding School holidays), October and November.

2.1.3 Programme constraints mean that it is not always possible to undertake surveys in neutral months however all traffic surveys used as part of the evidence base to support the Environmental Statement (2017) have been carried out during periods that do not coincide with school holidays. The traffic surveys are used, amongst other things, to assess the traffic impact of HS2 traffic at junctions. Junction assessments are undertaken during the peak hours to ensure that the worst case is modelled, and generally peak hour traffic coincides with the standard commuter traffic peaks which is often between 08:00 - 09:00 and 17:00 – 18:00. Avoiding school holidays generally ensures that a higher proportion of commuter traffic is captured in the traffic survey and therefore a worst case junction assessment is undertaken as part of the transport assessment.

2.1.4 In Woore analysis of the traffic surveys indicates that the weekday peak hour for traffic occurs during the typical PM peak, between the hours of 17:00 – 18:00 hours. This is reflected in both the March 2016 surveys and the August 2018 surveys. Tables 7 and 8 and the associated summary in Section 5 provide further details.

3 Brief explanation of average daily traffic, annual average daily traffic and seasonality factors

3.1.1 The Environment Statement (2017) Vol 5 Transport Assessment (TA) reports Annual Average Daily Traffic (AADT) flows. Annual average daily traffic is a measure of the average daily traffic flow over the year including weekdays, weekends and public holidays. Most traffic surveys involve the collection of a sample of data, usually for a period of two weeks. This data is then averaged over the 14 day period to produce Average Daily Traffic (ADT) flows. Seasonality factors are then applied to remove seasonal bias and applying such factors converts average daily traffic short count data to annual average daily traffic data.

3.1.2 Seasonality factors are provided by the Department for Transport. Seasonality factors are calculated using observed data, disaggregated for different categories of road and vehicle type and are updated annually.

3.1.3 HS2 construction traffic and where appropriate operational traffic will use the highway network throughout the year. Annual average daily traffic flows provide a suitable average baseline from which the volume and impact of HS2 traffic can be assessed relative to the baseline.

4 Traffic surveys

August 2018 Woore traffic surveys

4.1.1 Additional traffic surveys have been undertaken in Woore in August 2018. At the High Speed Rail Bill Select Committee hearing committee, the Chairman of Woore Parish Council, Mr Cowey, stated that the March 2016 traffic surveys fail to capture the higher traffic flows in Woore experienced in the Spring, Summer and Autumn months. Select Committee have requested that HS2 provide further reassurance that traffic surveys, undertaken to support the Environment Statement (2017) are valid. HS2 have agreed to undertake further traffic surveys. This report provides a comparison both sets of surveys.

4.1.2 Automatic traffic count surveys have been undertaken in four locations. The survey locations, identified by the orange circles and numbers 1-4 on Figure 1, are as follows:

- Site 1 – A51 London Road just to the north of the Bridgemere Garden World goods entrance;
- Site 2 – A51 London Road just to the south of the Bridgemere Garden World main entrance;
- Site 3 – A525 Newcastle Road just to the east of the Coopers Arms public house; and
- Site 4 – A51 London just to the south of the Falcon Inn public house.

4.1.3 Fully classified link volume traffic data has been collected 24 hours a day for two weeks. In addition speed data has also been collected for two weeks commencing the 18/8/2018.

Environment Statement (2017) March 2016 surveys

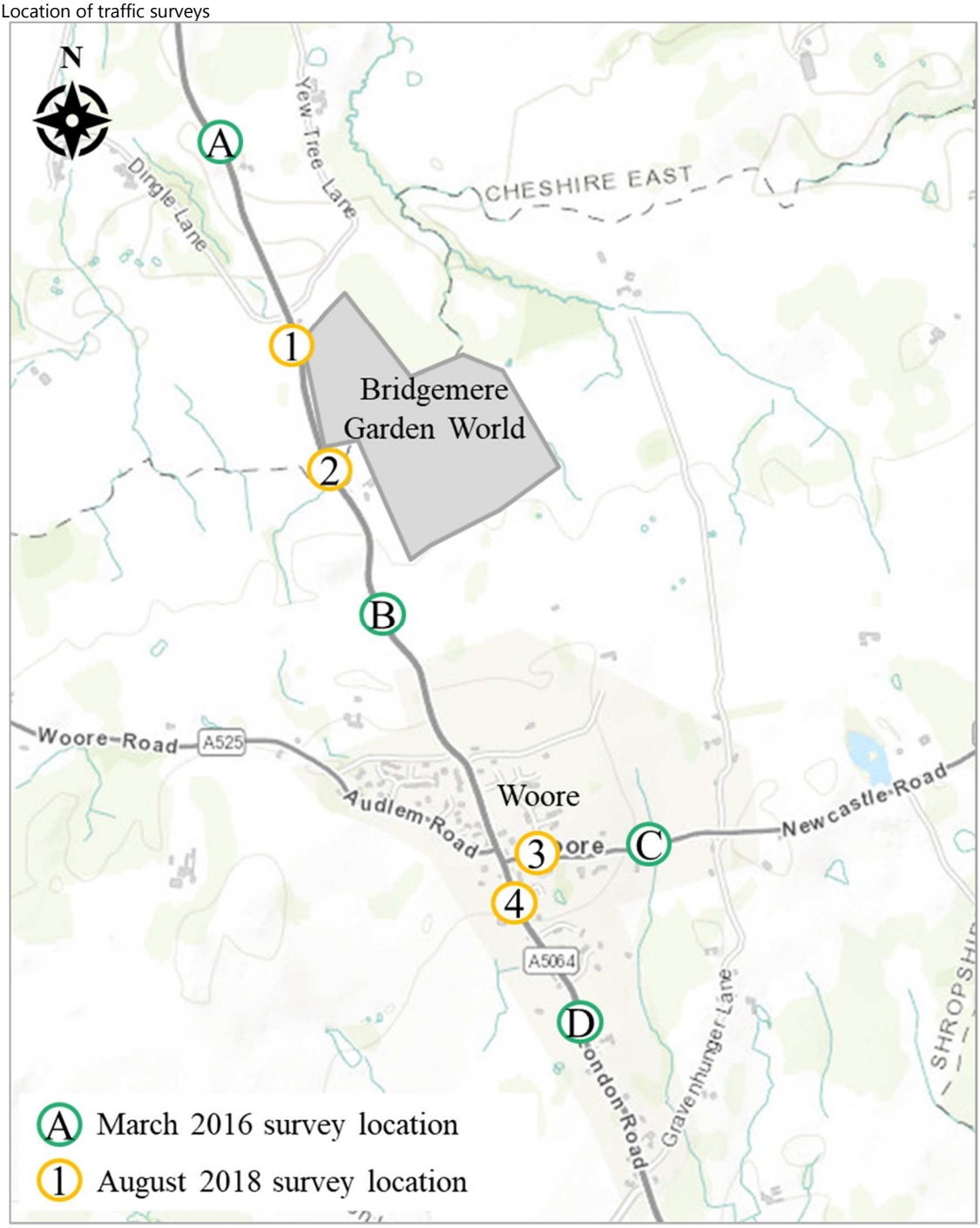
4.1.4 The Environment Statement (2017) has a 2016 baseline for traffic data. Programme constraints meant that the vast majority of traffic needed to be surveyed before the 2016 Easter holidays. In Woore surveys where undertaken in the last week in February and the first two weeks in March. Traffic flow data is reported in the Environment Statement (2017) Vol 5 Transport Assessment (TA) Environment Statement.

4.1.5 The March 2016 surveys are also shown on Figure 1. The survey locations from north to south, identified by the green circles and letters A-D on Figure 1 are as follows:

- Site A - A51 London Road, north of the Bridgemere Garden World goods entrance between Dingle Lane south and Dingle Lane north;
- Site B - A51 London Road, between Candle Lane and the Bridgemere Garden World main entrance;

- Site C - A525 Newcastle Road, between Gravenhunger Lane and A51 London Road; and
- Site D - A51 London Road between Gravehunger Lane and A525 Newcastle Road.

Figure 1: Location of traffic surveys



5 Traffic flow data summary and analysis

5.1.1 Traffic data for each survey site in and around Woore is reported in Tables 1 to 8 below. Comparable survey data is shown in subsequent tables so that August 2018 traffic data can easily be compared with March 2016 Environment Statement (2017) data. Tables 1, 3, 5 and 7 report August 2018 survey summary traffic data. Tables 2, 4, 6 and 8 report March 2016 Environment Statement (2017) data survey summary traffic data.

5.1.2 Each table reports the following data:

- AM peak 08:00 – 09:00 (weekdays only);
- PM peak 17:00 – 18:00 (weekdays only);
- Average Daily Traffic (ADT), all vehicles;
- ADT Heavy Goods Vehicle (HGV), (HGVs only);
- ADT HGV %, (HGVs expressed as a percentage of all vehicles);
- Annual Average Daily Traffic (AADT), ADT short term data with seasonal adjustment factors applied to remove seasonal bias;
- AADT HGV, (HGVs only); and
- AADT HGV %, HGVs expressed as a percentage of all AADT vehicles.

5.1.3 Tables 1 and 2 report August 2018 and March 2016 summary traffic data respectively for comparable sites on the A51 London Road north of Bridgemere Garden World.

Table 1: Site 1 – A51 London Road, north of the Bridgemere Garden World goods entrance, August 2018 flows (vehicles)

Direction	AM Peak 8-9	PM peak 17-18	ADT	ADT HGV	ADT HGV %	AADT	AADT HGV	AADT HGV %
Northbound	152	238	2605	48	1.9	2439	47	1.9
Southbound	147	243	2598	50	1.9	2433	49	2.0
Two way	299	481	5204	98	1.9	4872	96	2.0

Table 2: Site A - A51 London Road, north of the Bridgemere Garden World goods entrance between Dingle Lane south and Dingle Lane north, March 2016 flows (vehicles)

Direction	AM Peak 8-9	PM peak 17-18	ADT	ADT HGV	ADT HGV %	AADT	AADT HGV	AADT HGV %
Northbound	140	237	2411	48	2.0	2466	48	1.9
Southbound	134	224	2368	51	2.1	2423	51	2.1
Two way	273	460	4779	98	2.1	4889	99	2.0

5.1.4 Comparing traffic data in Tables 1 and 2:

- there is negligible difference in the peak hours flows;
- average daily traffic flows are approximately 10% higher in the August 2018 surveys;
- there is negligible difference in HGV flows and proportions; and
- there is negligible difference between annual average daily traffic flows.

5.1.5 Tables 3 and 4 report August 2018 and March 2016 summary traffic data respectively for comparable sites on the A51 London Road south of Bridgemere Garden World.

Table 3: Site 2 – A51 London Road, south of the Bridgemere Garden World main entrance, August 2018 flows (vehicles)

Direction	AM Peak 8-9	PM peak 17-18	ADT	ADT HGV	ADT HGV %	AADT	AADT HGV	AADT HGV %
Northbound	192	201	2683	51	1.9	2512	50	2.0
Southbound	115	292	2684	45	1.7	2513	44	1.8
Two way	307	494	5367	96	1.8	5025	94	1.9

Table 4: Site B - A51 London Road, between Candle Lane and the Bridgemere Garden World main entrance, March 2016 flows (vehicles)

Direction	AM Peak 8-9	PM peak 17-18	ADT	ADT HGV	ADT HGV %	AADT	AADT HGV	AADT HGV %
Northbound	189	211	2629	42	1.6	2689	42	1.6
Southbound	116	259	2508	49	2.0	2566	49	1.9
Two way	305	471	5137	91	1.8	5255	91	1.7

5.1.6 Comparing traffic data in Tables 3 and 4:

- there is negligible difference in the peak hours flows;
- average daily traffic flows are approximately 5% higher in the August 2018 surveys;
- there is negligible difference in HGV flows and proportions; and
- annual average daily traffic flows are approximately 5% higher in the March 2016 surveys.

5.1.7 Tables 5 and 6 report August 2018 and March 2016 summary traffic data respectively for comparable sites on the A525 Newcastle Road.

Table 5: Site 3 – A525 Newcastle Road just to the east of the Coopers Arms public house, August 2018 flows (vehicles)

Direction	AM Peak 8-9	PM peak 17-18	ADT	ADT HGV	ADT HGV %	AADT	AADT HGV	AADT HGV %
Eastbound	120	183	1983	31	1.6	1857	31	1.7
Westbound	151	149	1946	55	2.8	1822	54	3.0
Two way	271	333	3929	86	2.2	3679	85	2.3

Table 6: Site C - A525 Newcastle Road, between Gravenhunger Lane and the A51 London Road, March 2016 flows (vehicles)

Direction	AM Peak 8-9	PM peak 17-18	ADT	ADT HGV	ADT HGV %	AADT	AADT HGV	AADT HGV %
Eastbound	76	98	1207	19	1.6	1235	19	1.5
Westbound	84	132	1199	20	1.7	1226	20	1.6
Two way	160	231	2406	39	1.6	2461	39	1.6

5.1.8 Comparing traffic data in Tables 5 and 6:

- both peak hour flows are approximately 100 vehicles higher in the August 2018 surveys;
- average daily traffic flows are approximately 65% higher, equivalent to approximately 1500 vehicles, in the August 2018 surveys;
- HGV volumes and proportions are higher in the August 2018 surveys, annual average daily traffic HGV is approximately 50 vehicles higher than March 2016 survey; and
- annual average daily traffic flows are approximately 50% higher in the august 2018 surveys.

5.1.9 Tables 7 and 8 report August 2018 and March 2016 summary traffic data respectively for comparable sites on the A51 London Road south of the A525 Newcastle Road.

Table 7: Site 4 – A51 London Road just to the south of the Falcon Inn public house, August 2018 flows (vehicles)

Direction	AM Peak 8-9	PM peak 17-18	ADT	ADT HGV	ADT HGV %	AADT	AADT HGV	AADT HGV %
Northbound	238	314	3467	65	1.9	3246	64	2.0
Southbound	201	367	3448	65	1.9	3228	64	2.0
Two way	439	681	6914	130	1.9	6474	128	2.0

Table 8: Site D - A51 London Road between Gravehunger Lane and Newcastle Road, 2016 Hybrid Bill flows (vehicles)

Direction	AM Peak 8-9	PM peak 17-18	ADT	ADT HGV	ADT HGV %	AADT	AADT HGV	AADT HGV %
Northbound	226	329	3301	114	3.5	3377	115	3.4
Southbound	174	324	3115	64	2.1	3186	65	2.0
Two way	400	653	6416	179	2.8	6563	179	2.7

5.1.10 Comparing traffic data in Tables 7 and 8:

- there is negligible difference in the peak hours flows;
- average daily traffic flows are approximately 8% higher, equivalent to approximately 500 vehicles, in the August 2018 surveys; and
- HGV volumes and proportions are higher in the March 2016 surveys, annual average daily traffic HGV is more than 60 higher than August 2018 surveys; and
- there is negligible difference in the annual average daily traffic flows.

6 Further analysis

What is the traffic impact in Woore of the Bridgemere garden centre?

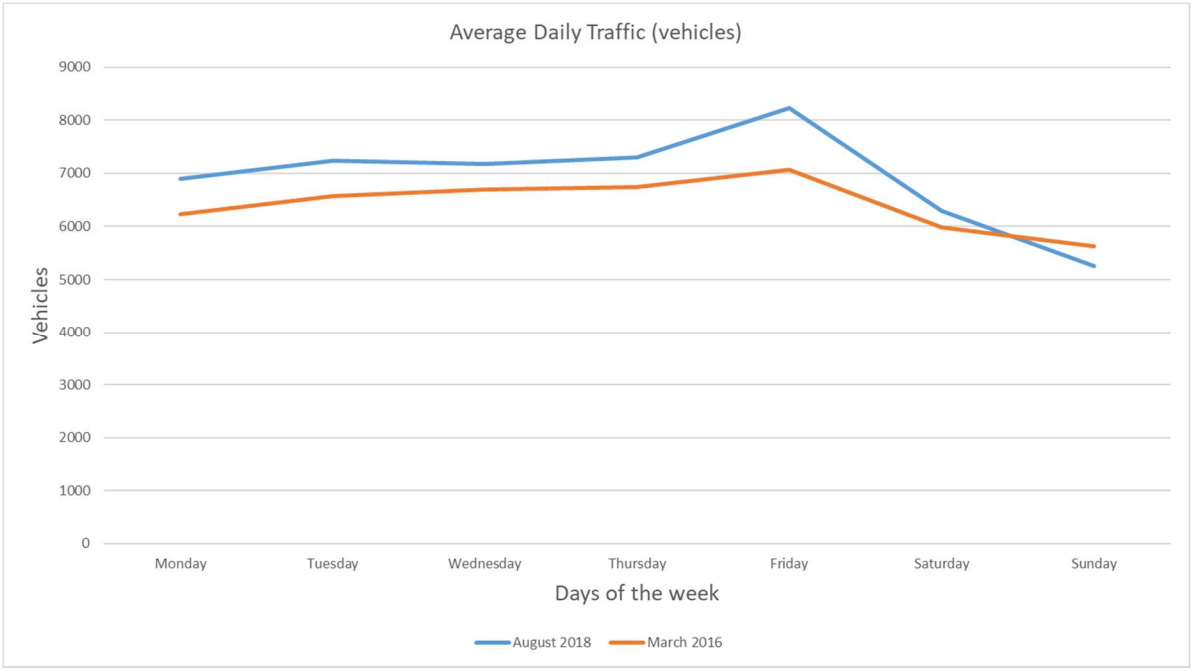
6.1.1 Based on the August 2018 Woore surveys Site 1 (north of the garden centre) and Site 2 (south of the garden centre) there is a difference of 163 vehicles (i.e. 5367 – 5204 = 163). The data indicates that, during the period of the survey, the average daily traffic flow generated by the garden centre and passing through Woore is 163 vehicles.

Are there other factors that could be effecting the difference in traffic flows between both ADT datasets?

6.1.2 Analysis of the average daily traffic data at Sites 4 and D on the A51 London Road in Woore indicates that there is a 10% (500 vehicles) difference in traffic flows between the March 2016 surveys and the August 2018 surveys.

6.1.3 Figure 2 below illustrates the variation in traffic volumes by day of the week. During the weekdays, Monday to Thursday, the difference in traffic between the two datasets is approximately 500 vehicles. On the Friday difference increases to over 1,000 vehicles and it is noted that Friday was the busiest day during when the March 2016 surveys. On the Sunday, traditionally a busy day for garden centres, traffic flows fall by more than 350 vehicles. This last point suggests that the Bridgemere garden centre, whilst it has some traffic impact, other seasonal factors are having a greater impact.

Figure 2 Comparison of August 2018 and HB March 2016 ADT data on the A51 London, Site 4 and Site D



6.1.4 The substantial increase in traffic on Friday is also significant. Figure 2 suggests that there is a substantial increase in traffic through Woore likely to be associated with the 'weekend getaway', which is also apparent during the winter months although not to the same extent. Weekend leisure trips will generally be more frequent during the summer months. However there is less clarity on any return journey as average daily traffic flows are lower on Sunday in 2018.

7 Traffic speed data

7.1.1 Data on traffic speeds was obtained at each of the four sites surveyed in August 2018. The mean speed and 85th percentile speed at each of the four sites is reported in Table 9.

Table 9 Traffic Speed Data, Sites 1 to 4

Site Reference	Location	Speed Limit (mph)	Direction	Mean Speed (mph)	85th Percentile Speed (mph)
1	A51 London Road, north of the Bridgemere Garden World goods entrance	60	Northbound	44.7	54.4
			Southbound	44.3	51.4
			Two way	44.0	53.0
2	A51 London Road, south of the Bridgemere Garden World main entrance	60	Northbound	40.5	49.7
			Southbound	40.5	47.9
			Two way	40.5	48.8
3	A525 Newcastle Road, between Gravenhunger Lane and the A51 London Road	30	Eastbound	22.4	25.9
			Westbound	20.5	25.1
			Two way	21.5	25.7
4	A51 London Road just to the south of the Falcon Inn public house	30	Northbound	27.1	30.6
			Southbound	28.2	32.0
			Two way	27.6	31.3

7.1.2 Table 9 shows that mean speeds at all survey locations are lower than the speed limit. In addition 85th percentile speeds are also lower than the speed limit at all locations except at Site 4 where the speed limit is marginally exceeded.

8 Summary and Conclusions

8.1.1 The objective of this report has been to summarise and compare both the March 2016 and August 2018 traffic surveys and determine whether the former surveys provide a valid and reliable evidence base to support the Environmental Statement (2017).

8.1.2 Analysis of the speed survey data indicates that some drivers are marginally exceeding the speed limit in Woore on the A51 London Road. Proposals to provide additional traffic calming in Woore would likely lead to a reduction in vehicle speeds through Woore.

8.1.3 Concerns have been expressed that during, in particular summer periods, traffic levels are higher than assumed in the Environment Statement (2017) Vol 5 Transport Assessment. The surveys only show a small increase of 5-10% in traffic flows at the time 2018 surveys than those assumed in the Environment Statement (2017) Vol 5 Transport Assessment, with the exception of the A525 Newcastle Road that will be subject to further investigation.

8.1.4 The Environment Statement (2017) Vol 5 Transport Assessment reports average daily traffic flows. Annual average daily traffic flows are seasonally adjusted ADT traffic flows. Applying seasonality factors ensures that the Environment Statement (2017) reflects a consistent baseline as traffic surveys have been undertaken during different months of the year. Furthermore HS2 construction and operational traffic will use the road network throughout the year not just in the winter or summer months. The report has shown there is negligible difference in AADT traffic flows on the A51 London Road between both sets of data, March 2016 and August 2018. There is also very little difference in the volume of HGVs on the A51 between both datasets, whilst HGV flows are lower in August 2018 at Site 4.

8.1.5 Traffic impacts and effects in Woore reported in the Environment Statement (2017) and Vol 5 Transport Assessment has been based on the March 2016 surveys with the data converted to annual average daily traffic flows where appropriate. The 2017 traffic assessment has been repeated in Woore using August 2018 data instead of March 2016 data. In addition seasonality factors have not been applied to the August 2018 data.

8.1.6 The Environment Statement (2017) reported major adverse traffic severance effects on the A51 London Road and A525 Newcastle Road in Woore as a result of increase in construction traffic. A revised assessment based on the August 2018 average daily traffic flows results in no new effects or changes to any of the reported effects in the Environment Statement (2017). Peak hour junction modelling of the junction of the A51 London Road / A525 Newcastle Road, using the August 2018 data as the baseline, shows

results which are entirely consistent with those reported in the Environment Statement (2017) and Vol 5 Transport Assessment with minimal queuing on all approach roads.

8.1.7 In summary the traffic survey data used to inform the Environmental Statement (2017) in Woore has shown to be valid. There are small differences in traffic flows on the A51 London Road between both datasets which become negligible differences once seasonality factors are applied. Furthermore a repeat assessment of traffic impacts and effects shows no changes to impacts and effects reported in the Environment Statement (2017). Therefore the March 2016 surveys provide valid and reliable evidence base to support the Environmental Statement (2017) whilst traffic surveys in respect of the A525 Newcastle Road will be subject to further investigation.

9 References

High Speed Rail (West Midlands – Crewe) Environmental Statement (2017)

https://www.gov.uk/government/collections/hs2-phase-2a-environmental-statement

High Speed Rail (West Midlands – Crewe) Environmental Statement Volume 5 Technical Appendices, Traffic and Transport, Transport Assessment (TR-001-000)

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