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## FELTHAM ROAD, ASHFORD

### HGV Assessment

22/11/2013

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# Feltham Road, Ashford

## HGV Assessment

22/11/2013

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# Project Background

## Preamble

WSP / May Gurney (WSPMG) have been commissioned by Surrey County Council (SCC, the Local Highway Authority) to undertake a study into the existing levels of HGV traffic along the B377 Feltham Road in Ashford to help inform the decision on a proposed 7.5 tonne weight limit on Feltham Road between the Clockhouse Lane / Feltham Road roundabout and the Spelthorne Borough Council boundary (approximately 50m west of the junction with Challenge Road). The extent of the proposed weight limit is shown in Figure 1.

The proposed weight limit would aim to significantly reduce the volume of HGVs travelling along Feltham Road by permitting access only to vehicles with legitimate use, such as accessing Ashford Business Complex or providing servicing or deliveries to residential or commercial properties along this route.

This study forms an extension to the Spelthorne Freight Study completed for SCC in 2012 and therefore draws upon data used in that report where applicable. This report outlines the methodology used in completing an initial study, plus a brief assessment of the data collected.

## Study Methodology

### Traffic Surveys

In order to obtain existing levels of HGV volumes and movements in the Borough of Spelthorne a number of classified Automatic Traffic Surveys Counters (ATCs) and video surveys have been completed.

ATCs have been conducted on Feltham Road, Windmill Road and Cadbury Road between the 7<sup>th</sup> and 13<sup>th</sup> September. These ATC surveys record the volume of traffic, vehicle speed and vehicle classification (defined by axle length).

Video surveys were completed on Feltham Road on the 11<sup>th</sup> September between the hours of 6am and 8pm and recorded the number of HGVs passing between the Clockhouse Lane / Feltham Road roundabout and the Spelthorne Borough Council boundary (the extent of the proposed weight limit). These surveys recorded the travel time of vehicles between these two locations to identify the number of vehicles that could be classed as 'through traffic' and those which had stopped on-route (for deliveries of other legitimate use).

Tables 1 and 2 show a description of ATC and video survey locations.

**Table 1 – ATC Survey Locations**

Road	Description
B377 Feltham Road	Lamp post 2, adjacent to the 'welcome to Spelthorne' sign and approximately 40m west of the Challenge Road junction
A244 Cadbury Road	South of the junction with Saddlebrook Road and approximately 200m north of the junction with the A308. This should also avoid the southbound bus stop on Cadbury Road.
A244 Windmill Road	Directly north of the junction of Swan House (Storecall) and 250m south of the junction with the A308

**Table 2- Video Survey Location**

Road	Description
Feltham Road (West)	On the Lamp post closest east of the Clockhouse Lane/ Feltham Road/ Convent Road roundabout on the north side of the carriageway.
Feltham Road (East)	On the Lamp post closest west of the Ashford Road/ Challenge Road/ Feltham Road Junction on the southern side of the carriageway.

To identify HGVs which are above 7.5T the videos surveys have been reviewed to split HGVs into three categories, namely:

- Category A: Two axle HGVs which may be 7.5T in weight when fully laden;
- Category B: Two axle HGVs which are above 7.5T in weight un-laden or laden; and
- Category C: HGVs with three or more axles which are definitely above 7.5T in weight.

Using these categories allows for an upper and lower estimation of the number of HGVs currently using Feltham Road that would be subject to the proposed weight limit. It should also be noted that the use of axle numbers is the only way it is possible to define weights of vehicles through the use of video surveys. Examples of each category of vehicle recorded on from the video survey is shown below for reference.

**Figure 2 – HGV less than 7.5T**

**Figure 3 – Two Axle HGV which may be above 7.5T fully laden**



**Figure 4 – Two Axle HGV above 7.5T**

**Figure 5 – Other HGVs above 7.5T**



Through this assessment of the video surveys it will also be possible to calculate estimates of the proportion of two-axle HGVs that are above 7.5T in weight recorded on the on the ATC surveys and therefor provides an additional level of analysis for this study. Without this data, all two-axle HGVs would be categorised together and this would underestimate the number of 7.5T vehicles currently using Feltham Road.

### Manual Classified Turning Counts

In addition to the ATC data, turning count data between the hours in the form of Manual Classified Counts has been collected at the Feltham Road / Challenge Road junction on Wednesday 6<sup>th</sup> November 2013 between 6am and 8pm. The Feltham Road / Challenge Road junction is located just to the east of the Spelthorne Borough Council boundary and as such will provide the last opportunity of westbound HGVs to avoid the proposed weight limit. As such this survey will provide details of the likely impact that additional HGV movements may have on the operation and safety of this junction.

### Swept Path Analysis

To complement the turning count data completed at the Feltham Road / Challenge Road junction to show whether a 40t articulated HGV (the maximum legal size of a vehicle in the UK) can successfully enter, exit and complete a three point turn within Challenge Road and Shield Road. This assessment is shown in drawing 406/ATR/001.

# Data Assessment

## Feltham Road HGV Flows

Using the traffic surveys discussed above and the data collected for the Spelthorne Freight Strategy this section provides an overview of HGV flows on Feltham Road and other surrounding routes. This assessment includes:

- A summary of weekday average HGV flow as a proportion of weekday total traffic flow;
- A summary of weekday average HGV flow between the hours of 5am and 8pm as a proportion of weekday total traffic flow;
- A summary of weekday average HGV flow between the hours of 6am and 6pm as a proportion of weekday total traffic flow;
- The total number of HGVs above 7.5T travelling on Feltham Road between the two video survey locations between 6am and 6pm;
- The total number of HGVs above 7.5T which will continue to travel along Feltham Road for access (e.g Ashford Business Complex);
- An estimate of the number of westbound traveling HGVs which will be displaced to other routes to avoid the proposed weight limit.

In assessing the ATC data the video survey results have been used to help calculate the number of HGVs currently using Feltham Road that are above 7.5T in weight. This assessment provides a split of the two axle vehicles that would not usually be possible from the ATC data alone and provides a much more accurate estimate of the number of vehicles that would be affected by the weight limit. In viewing the video survey the following figures were found:

- Category A HGVs accounted for 18.7% of two-axle vehicles recorded between 6am and 6pm;
- Category B HGVs accounted for 5.2% of two-axle vehicles recorded;
- Category C HGVs accounted for 18.2% of HGVs vehicles recorded;

These proportions have been applied to the ATC data to provide an upper and lower estimation of the number of HGVs currently using Feltham Road that would be subject to the proposed weight limit.

## Feltham Road ATC Survey Results

Table 3 provides a summary of HGV flows on Feltham Road for the average weekday and provides a baseline position of HGV flows through the proposed weight limit. The average weekday has been assessed as this will provide a higher volume of HGVs than the 7-day average and therefore presents a robust assessment of the impact of the proposed weight limit.

**Table 3 – Feltham Road HGV ATC Weekday 24hr Survey Results**

ATC & Survey Date	5 Day Average Traffic Flow 24 hours	Proportion of all HGVs incl. <3.5T	Average HGV flow per hour incl. <3.5T	Proportion of HGVs above 7.5T incl. Category A, B, C	Average HGV flow per hour incl. Category A, B, C	Proportion of HGVs above 7.5T incl. Category B & C	Average HGV flow per hour above 7.5T incl. Category B & C	Proportion of HGVs 40T & above (from ATC only)	Average HGV flow per hour 40T & above (from ATC only)
Feltham Road EB July 2012	5,082	13.9%	29	3.9%	8	2.2%	5	0.6%	1
Feltham Road WB July 2012	4,841	13.5%	27	3.4%	7	1.7%	4	0.4%	1
Feltham Road September 2013 EB	4,934	12.9%	27	4.0%	8	1.8%	4	0.9%	1
Feltham Road September 2013 WB	4,576	12.2%	23	3.6%	7	2.0%	4	0.6%	1
<b>AVERAGE TWO-WAY</b>	<b>9,717</b>	<b>13.1%</b>	<b>53</b>	<b>3.7%</b>	<b>15</b>	<b>1.9%</b>	<b>7</b>	<b>0.63%</b>	<b>2</b>

The data presented in Table 3 shows that the traffic flows and proportion of HGVs has remained very similar on Feltham Road between the two survey dates. Across all survey periods all HGV traffic, including those that are less than 3.5T, accounted for an average of 13.1% of total traffic flow, the equivalent of 53 vehicles per hour or around one per minute. When considering vehicles above 7.5T and including categories A, B and C these were shown to account of 3.7% of traffic across the survey periods, which is approximately one vehicle four minutes. Out of these vehicles, seven per hour could be categorised and definitely being above 7.5T and two per hour could be defined as being above 40T in weight.

In addition to an assessment of traffic across a 24 hour period further analysis has been completed for the periods between 5am to 8pm and 6am to 6pm when the vast majority of HGV movements are likely to occur. This will present a higher HGV flow for all weight categories given that the proportions of total traffic will not be reduced by night time periods when few commercial HGV movements are completed. Table 4 provides a summary of the ATC surveys collected in July 2012 and September 2013 between 5am and 8pm.

**Table 4 – Feltham Road HGV ATC Weekday 5am to 8pm Survey Results**

ATC & Survey Date	5 Day Average Traffic Flow 5am to 8pm	Proportion of all HGVs incl. <3.5T	Average HGV flow per hour incl. <3.5T	Proportion of HGVs above 7.5T incl. Category A, B, C	Average HGV flow per hour incl. Category A, B, C	Proportion of HGVs above 7.5T incl. Category B & C	Average HGV flow per hour above 7.5T incl. Category B & C	Proportion of HGVs 40T & above (from ATC only)	Average HGV flow per hour 40T & above (from ATC only)
Feltham Road EB July 2012	4,574	14.3%	44	4.0%	12	2.3%	7	0.5%	2
Feltham Road WB July 2012	4,256	14.0%	40	3.6%	10	1.8%	5	0.4%	1
Feltham Road September 2013 EB	4,484	13.7%	41	4.2%	12	1.8%	5	0.9%	3
Feltham Road September 2013 WB	4,060	12.9%	38	3.8%	10	2.0%	6	0.7%	2
<b>AVERAGE TWO-WAY</b>	<b>8,687</b>	<b>13.7%</b>	<b>82</b>	<b>3.9%</b>	<b>22</b>	<b>2.0%</b>	<b>9</b>	<b>0.6%</b>	<b>4</b>

The results presented in Table 4 show that when considering the 5am to 8pm average weekday the proportion of HGVs including those under 3.5T increases by approximately half a percent to 13.7% of all traffic. This is equal to an average of one vehicle every 44 seconds travelling on Feltham Road in either direction. When analysing vehicles over 7.5T however, and including categories A, B and C the proportion of all traffic increased slightly to 3.9%, or 22 vehicles per hour which is approximately one vehicle every three minutes. Out of these vehicles, nine per hour could be categorised as definitely being above 7.5T (one every six to seven minutes) and four per hour could be categorised as being 40T or above (one every 15 minutes).

Table 5 provides a summary of HGV flows on Feltham Road for the average weekday between 6am and 6pm.

**Table 5 – Feltham Road HGV ATC Weekday 6am to 6pm Survey Results**

ATC & Survey Date	5 Day Average Traffic Flow 6am to 6pm	Proportion of all HGVs incl. <3.5T	Average HGV flow per hour incl. <3.5T	Proportion of HGVs above 7.5T incl. Category A, B, C	Average HGV flow per hour incl. Category A, B, C	Proportion of HGVs above 7.5T incl. Category B & C	Average HGV flow per hour above 7.5T incl. Category B & C	Proportion of HGVs 40T & above (from ATC only)	Average HGV flow per hour 40T & above (from ATC only)
Feltham Road EB July 2012	3,986	14.8%	49	4.3%	14	2.5%	8	0.6%	2
Feltham Road WB July 2012	3,561	14.7%	44	3.8%	11	2.0%	6	0.4%	1
Feltham Road September 2013 EB	3,895	14.1%	46	4.3%	14	1.9%	6	0.9%	3
Feltham Road September 2013 WB	3,411	13.8%	39	4.0%	11	2.2%	6	0.7%	2
<b>AVERAGE TWO-WAY</b>	<b>7,427</b>	<b>14.4%</b>	<b>89</b>	<b>4.1%</b>	<b>25</b>	<b>2.2%</b>	<b>10</b>	<b>0.7%</b>	<b>4</b>

For the period between 6am and 6pm the data in Table 5 shows that the proportion of all categories of HGVs increase slightly above the previous assessment periods. For HGVs above 7.5T (including categories A, B and C) these vehicles accounted for 4.1% of total traffic, with an average flow of 25 vehicles per hour. Out of these vehicles ten per hour could definitely be categorised as being above 7.5T and hour per hour could be categorised as being above 40T.

### Feltham Road Video Survey Results

Taking account of the ATC analysis contained in the section above the video surveys have been assessed for the weekday 6am to 6pm time period, when the flow of HGVs that are 7.5T or above in weight is at its highest (10-25 per hour two-way movements). Whilst it is noted that the use of this criteria will record a lower number of vehicles than the weekday 5am to 8pm time period the use of a higher average hourly HGV flow presents the greatest concentration of vehicle movements throughout the day.

Two separate methods have been used to identify HGVs on the video survey that were using Feltham Road for access (rather than as a through route), namely:

- The recorded travel time between the two camera locations; and
- Whether or not the HGV was recorded passing through both camera locations.

In regards to the travel time, the distance between the two survey cameras was approximately 1,100m meaning that that a vehicle travelling along Feltham Road at an average speed of 25mph (40kmph) would take less than two minutes to pass through each of the survey locations. However, to take into consideration traffic congestion during the day and, more importantly, the time it would take for a delivery to take place on-route, a maximum travel time of 5 minutes has been used to define HGVs on Feltham Road as being through traffic.

In addition to travel time measurements the video survey also recorded a number of HGVs at only one of the two camera locations on Feltham Road and where this has occurred it can be assumed that these vehicles

used this route for access reasons, such as delivering to Ashford Business Complex or addresses on Chambers Road East / Park Road. Where such records occurred eastbound HGVs were recorded entering Feltham Road at the Clockhouse Lane / Feltham Road roundabout and westbound HGVs were recorded entering Feltham Road at the Spelthorne Borough Council boundary.

As with the ATC data two sets of results have been provided to include those vehicles which may have been 7.5T in weight (Category A, B and C) and those vehicles which were definitely 7.5T or above in weight (Category C only). Table 6 below provides a summary of the results of the video survey.

**Table 6- Results of Feltham Road Video Survey – HGVs above 7.5T only – 6am to 6pm**

HGV Category	Direction of Travel	Total Number of HGVs	Travel Time Between Survey Cameras				Number of HGVs Recorded at Only One Camera	Total Number of HGVs using Feltham Road for Access	HGV Flow Per Hour Displaced to Other Routes By Weight Restriction
			<2 min	<3 min	<5 min	>5 min			
Category A, B and C	EB	133	76 (57%)	85 (64%)	91 (68%)	10 (8%)	32 (24%)	42 (32%)	8
	WB	85	66 (78%)	75 (88%)	75 (88%)	4 (5%)	6 (7%)	10 (12%)	6
	<b>Two-Way Movements</b>	<b>218</b>	<b>142 (65%)</b>	<b>160 (73%)</b>	<b>166 (76%)</b>	<b>14 (6%)</b>	<b>38 (17%)</b>	<b>48 (22%)</b>	<b>14</b>
Category B and C	EB	75	49 (65%)	56 (75%)	57 (76%)	4 (5%)	14 (19%)	18 (24%)	5
	WB	48	39 (87%)	43 (96%)	43 (96%)	2 (4%)	3 (6%)	5 (10%)	4
	<b>Two-Way Movements</b>	<b>123</b>	<b>88 (72%)</b>	<b>99 (81%)</b>	<b>100 (81%)</b>	<b>6 (5%)</b>	<b>17 (14%)</b>	<b>23 (19%)</b>	<b>9</b>

In considering Category A, B and C HGVs the table above shows that 218 two-way HGV movements were recorded between the two camera locations between the hours of 6am and 6pm and of these 166 vehicles (76%) travelled through the survey area in less than five minutes, meaning they have been defined as through traffic. In addition 38 HGVs were only recorded at one camera location, meaning that they used Feltham Road for access reasons. Taking account of these records and the travel times above five minutes it can be estimated that 48 HGVs above 7.5T used Feltham Road for access reasons between 6am and 6pm. As such the proposed weight limit would displace an average of 14 two-way movements per hour from Feltham Road.

When assessing only Category B and C vehicles (those definitely above 7.5T) the table above shows that 123 two-way movements were recorded at the two camera locations between 6am and 6pm and of those 100 vehicles (81%) travelled through the survey area in less than five minutes. In terms of the vehicles recorded at only one camera location or those with travel times above five minutes, the proportions of total HGVs is very similar to category A and B vehicles with 5% having a travel time above five minute and 14% being recorded at only one camera. This means that 23 HGVs above 7.5T (23%) used Feltham Road for access reasons between 6am and 6pm. As such the proposed weight limit would displace an average of nine two-way movements per hour from Feltham Road.

As a sensitivity test of the travel time recordings during the peak hours have been assessed as to provide a check if traffic congestion on Feltham Road may be disproportionately increasing travel times above five minutes. In the eastbound direction 38 HGVs were recorded between the hours of 7am to 10am of which 35 has a travel time of less than five minutes. In the PM peak between 4pm and 6pm all 41 vehicles recorded has a travel time of less than five minutes. In the westbound direction 34 out of 37 HGVs had a travel time of less than five minutes in the AM peak along with all 27 vehicles recorded in the PM peak. This shows that peak hour congestion is not having an impact on the methodology used to estimate the number of HGVs using Feltham Road for access.

## Challenge Road MCC Data

Manual classified turning count data was collected at the Feltham Road / Challenge Road junction between the hours of 6am to 8pm and provides details of the existing HGV turning movements into and out of Challenge Road and how these may be affected by the proposed weight restriction that would start just to the west of this junction. Table 7 shows summary of total traffic and HGV turning movements at the junction during the AM peak, PM peak, inter-peak (the busiest hour for HGV movements throughout the day outside of the AM and PM peaks) and the 6am to 8pm period.

**Table 7 –Feltham Road / Challenge Road Turning Count Data**

	AM Peak (8am-9am)		Inter-Peak (10:15-11:15)		PM Peak (5pm-6pm)		6am to 8pm	
	Total Traffic	HGVs	Total Traffic	HGVs	Total Traffic	HGVs	Total Traffic	HGVs
Feltham Rd WB								
Ahead	196	5	197	14	323	2	2,979	87
Right	71	7 (9.9%)	36	15 (41.7%)	30	14 (46.7%)	698	148 (21.2%)
Challenge Road								
Left	38	14	44	20	98	6	795	188
Right	47	10 (21.3%)	60	13 (21.7%)	209	12 (5.7%)	1,115	141 (12.6%)
Feltham Rd EB								
Left	182	6 (3.3%)	77	23 (29.9%)	58	17 (29.3%)	1,188	175 (14.7%)
Ahead	334	8	193	14	265	3	3,196	99

Table 7 shows that throughout the day Feltham Road WB currently experiences a higher volume of HGVs turning right into Challenge Road than the number of vehicles that continue straight along Feltham Road into the area that will be covered by the proposed weight restriction. As such, even if all vehicles currently traveling straight along Feltham Road WB were to turn right into Challenge Road to perform a u-turn (and avoid the weight restriction) this would, in our opinion, have little impact on the operation or safety of this junction.

In addition, there are also more vehicles turning left into Challenge Road from Feltham Road EB than continue straight ahead throughout the day, which suggests that HGVs using Feltham Road primarily do so to access commercial properties on Challenge Road. The majority of HGVs exiting Challenge Road currently turn right onto Feltham Road WB meaning that these would turn left in future to avoid the proposed weight restriction. However, this would result in 33 HGVs turning left out of Challenge Road during the inter-peak hour, or a maximum of 47 HGVs per hour if including u-turns from Feltham Road WB. In our opinion, this is unlikely to have a detrimental impact on the operation or safety of this junction.

## Estimated Impact of Weight Limit on Other Routes

Using the data contained in Table 6 it is possible to estimate the impact of the proposed 7.5T weight limit on routes surrounding Feltham Road. Those routes are likely to carry HGVs displaced by the proposed weight limit include Convent Road and School Road, Clockhouse Lane, A308 Staines Road West and Chertsey Road.

Table 8 below provides a breakdown of average weekday traffic flows between the hours of 6am and 6pm on the routes likely to be impacted by the proposed weight limit and the estimated impact on HGV flows. As a robust assessment the figures for Category A, B and C HGVs have been used when calculating the potential impact on other routes. For comparison purposes Feltham Road has been included with an estimate of the future traffic flows with the weight limit in place.

**Table 8 –Impact of Proposed Weight Restriction - Weekday 6am to 6pm**

Site	5 Day Average Traffic Flow 6am-6pm	Without Weight Restriction on Feltham Road		With Weight Restriction on Feltham Road	
		Proportion of HGVs above 7.5T vehicles	Average HGV flow per hour above 7.5T vehicles	Proportion of HGVs above 7.5T vehicles	Average HGV flow per hour above 7.5T vehicles
Feltham Road Sep 13 EB	3,986	4.3%	14	1.89%	6
Feltham Road Sep 13 WB	3,561	4.0%	11	1.98%	6
Convent Rd / School Rd NB	3,785	7.6%	24	9.50%	30
Convent Rd / School Rd SB	5,450	6.1%	28	7.86%	36
Clockhouse Lane NB	6,599	2.7%	15	N/A due to existing weight limit	
Clockhouse Lane SB	5,688	4.4%	21	5.67%	27
Chertsey Rd / Cadbury Rd NB	4,752	3.1%	12	5.12%	20
Chertsey Rd / Cadbury Rd SB	4,106	3.5%	12	5.25%	18
A308 Staines Rd EB	12,111	7.8%	79	8.59%	87
A308 Staines Rd WB	12,286	9.7%	100	10.29%	105

Table 8 shows that the impact of the weight restriction will be minimal on routes surrounding Feltham Road with increases in HGV flow as a proportion of total traffic flow of between 0.6% and 2.7%. The average HGV flow per hour increases in line with that presented in Table 6, with the increases likely to be most noticeable on Cadbury Road / Chertsey Road in both directions. In viewing these results it should be highlighted that they assume all displaced HGV traffic use all routes. In reality the HGVs displaced from Feltham Road will use a range of different routes and as such the impacts are likely to be lower than presented in Table 8.

## Conclusions

Taking account of the assessment undertaken within this study it has been demonstrated the proposed weight limit on Feltham Road will reduce the flow of HGVs above 7.5T by approximately 50-60%, which is the equivalent of a reduction of just over 2% in total traffic flow. A small number of HGVs above 7.5T will continue to use this route for access reasons but only around 50 vehicles per day, which is the equivalent of approximately one vehicle every 14 minutes between 6am and 6pm.

The MCC data collated for the Feltham Road / Challenge Road junction has shown that the majority of HGVs using Feltham Road do so to access Challenge Road. This data has also shown that the operation and safety of this junction is unlikely to be adversely affected by an increase in the number of HGVs turning right into Challenge Road or left out of Challenge Road (to avoid the proposed weight restriction).

In terms of the impact on other routes, it is estimated that this would be negligible with the increases in HGV flow per hour representing minimal increases in the proportion of HGVs compared to total traffic flow. Chertsey Road and School Road could possibly experience a noticeable increase in HGV traffic where the frequency of vehicles might increase by four minutes and five minutes, respectively.

# Figures



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