

TECHNICAL NOTE



from:	ALAN DAVIES	date:	31/10/2021
subject:	PROPOSED CONVERSION AND EXTENSION OF EXISTING STABLE BLOCK AND ERECTION OF GARAGE. P/2021/0780	file ref:	J1352-TN2

Introduction

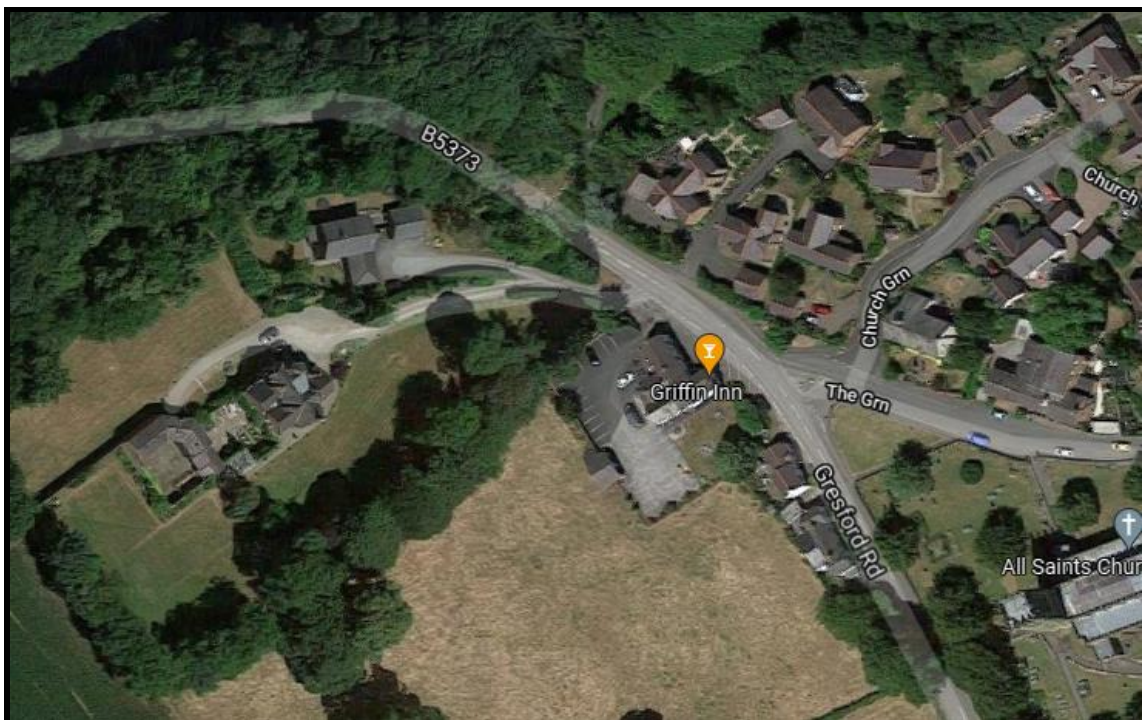
A planning application has been submitted with supporting Transport Statement, this has been reviewed by Highways and considered inadequate in terms of detail and an objection made based on highway safety.

The applicant has sort an independent view of the details submitted and an indication if a way forward to remove the objection can be made.

This Technical Note sets out the response to the request.

Setting

The site lies to the NW side of Gresford along the B5373 route adjacent to the Griffin Inn PH.



Gresford Road is subject to a 30mph speed limit at and to the east of the site access but the speed limit increases to 40mph immediately to the west of the site access. Further to the south a section of Gresford Road in the vicinity of the school is subject a 20mph speed limit and is traffic calmed with speed cushions.

Gresford Road is street lit within the 20 and 30mph limits, albeit with only a limited number of columns, but is unlit within the 40mph limit.

There is no footway on the south side of Gresford Road or on the north side to the east of the church boundary. On the north side the footway commences at the church boundary to the east of The Green

and continues westwards towards the site access where it becomes quite narrow at the speed limit boundary and heading down the hill out of the built up area.

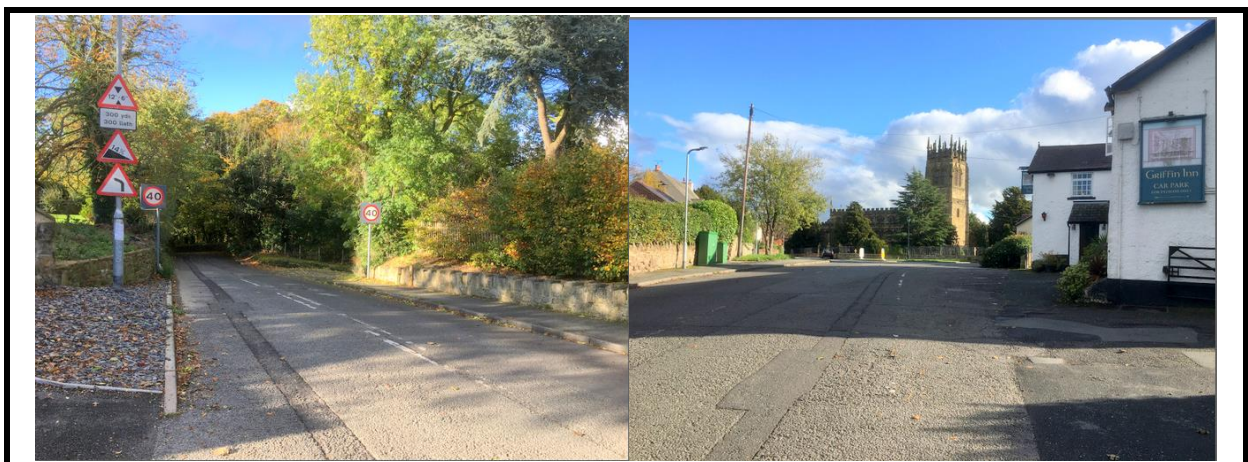
Although vehicles approaching from the left are emerging from a 40mph speed limit they are doing so after negotiating a bend and then travelling up a fairly steep gradient.



East side of PH to and away from access



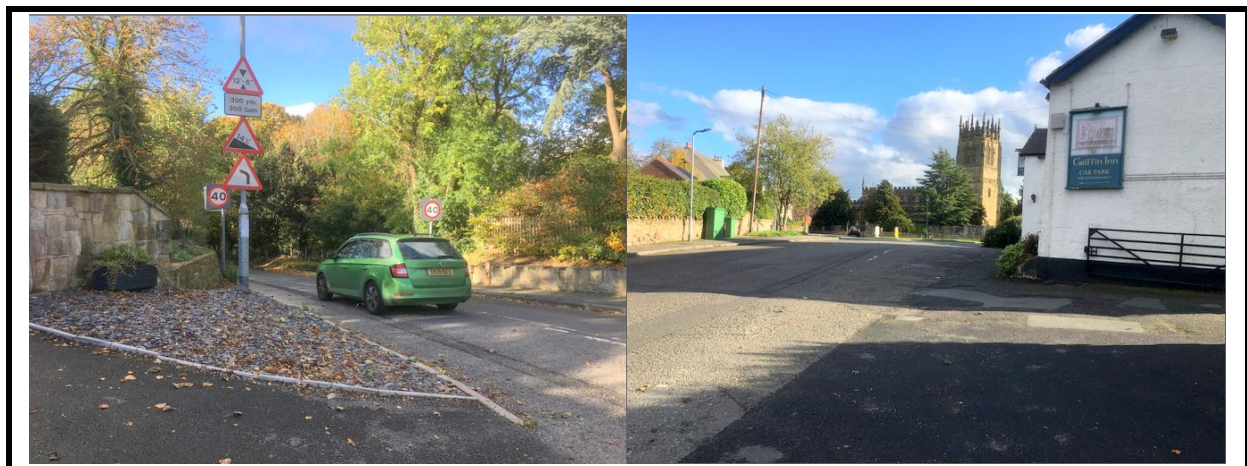
To and away from access to south of route



visibility at the site access at the edge of carriageway



visibility at a nominal set back of 2.0 metres



visibility at a nominal set back of 2.4 metres.



View into and out of access



View to junction from main road



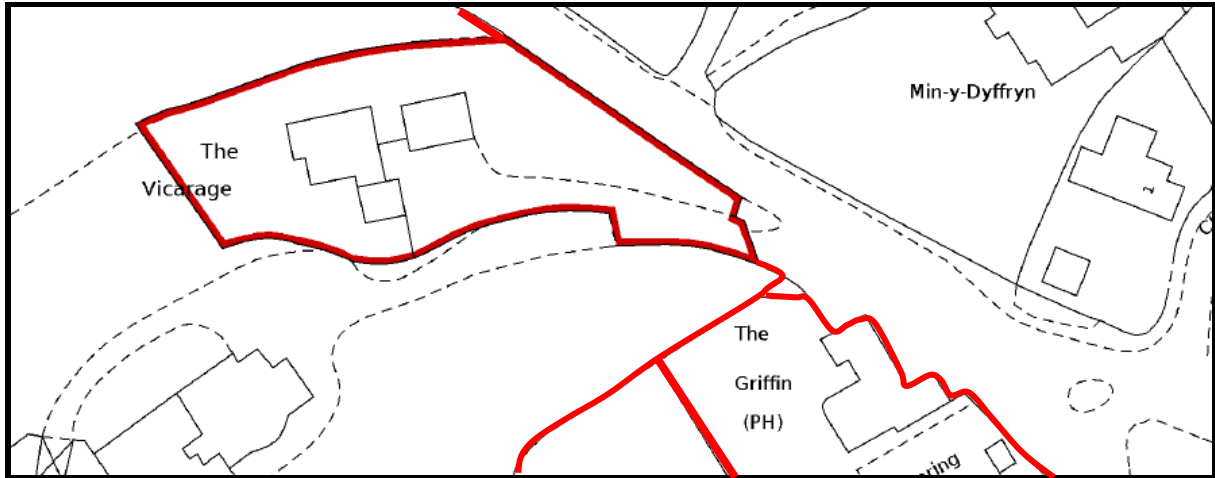
View uphill site and down hill to end



Uphill from bend and away around the bend

Land ownership and adoption records

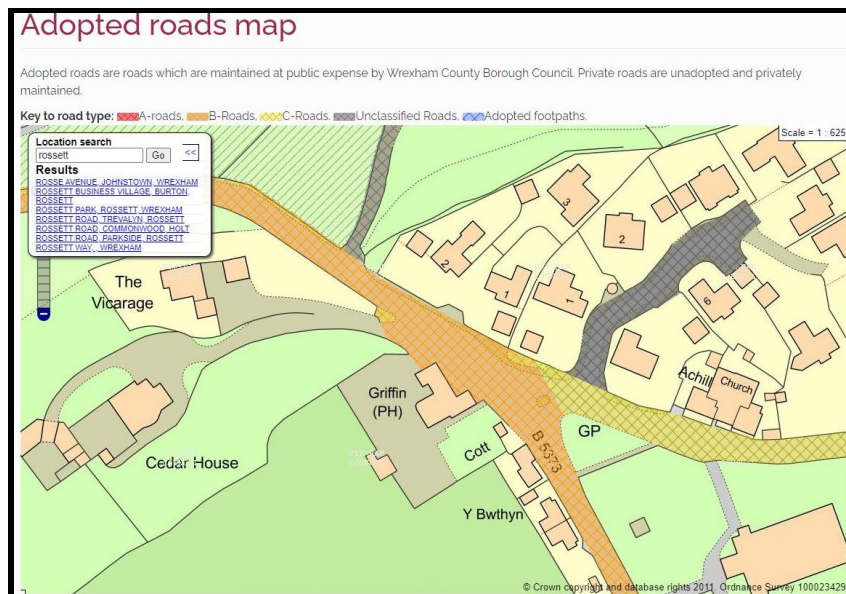
A check on land ownerships shows:



This suggests the tarmaced area and the small nib to the drive where changes have been made is either unregistered or adopted highway. The area contains street furniture as shown below supporting the adopted highway suggestion.



The adopted highway records below shows the tarmaced area and the then verge forms part of the highway network.



This can be used to provide the basis of the sight line review to ascertain if they fall within highway or third party land.

Traffic speeds

The submitted report refers to a 2018, a traffic survey was undertaken to verify traffic speeds and to establish appropriate visibility requirements.

The survey recorded the northwesterly traffic speed to be 25mph and the southeasterly to be 25.6mph. TAN18 Annex B suggests respective visibility requirements of 31m and 34.4m.

Given that the sight lines to each side have a different character i.e. upgrade from the left side and flat to the right additional surveys have been undertaken to create a speed profile across the junction area.

Full details in appendices and speed abstracts overleaf.

Automatic Classified Counts, Gresford							
DATE: 07/10/2021 TO 13/10/2021							
LOCATION: GRESFORD ROAD (EASTERN SITE)							
Direction : WESTBOUND							
TIME PERIOD	85TH PERCENTILE						
	Thursday 07/10/2021	Friday 08/10/2021	Saturday 09/10/2021	Sunday 10/10/2021	Monday 11/10/2021	Tuesday 12/10/2021	Wednesday 13/10/2021
0:00 - 1:00	23.7	26.2	28.6	26.8	36.4	27.4	26.5
1:00 - 2:00	37.3	-	27.6	30.1	26.9	23.0	-
2:00 - 3:00	17.0	27.6	-	31.5	-	28.0	23.0
3:00 - 4:00	26.0	35.0	18.0	25.2	26.0	29.0	-
4:00 - 5:00	34.2	25.6	24.2	29.5	28.8	29.7	28.6
5:00 - 6:00	30.3	30.9	26.6	27.5	29.2	29.8	31.2
6:00 - 7:00	29.4	28.6	25.2	28.2	28.4	29.0	29.1
7:00 - 8:00	28.2	27.5	26.7	28.2	27.0	26.1	27.1
8:00 - 9:00	27.0	26.6	27.5	27.7	26.9	26.4	26.7
9:00 - 10:00	26.6	26.3	26.9	25.9	27.0	25.8	26.3
10:00 - 11:00	25.5	25.3	25.5	26.6	26.4	26.8	26.3
11:00 - 12:00	24.7	25.5	26.0	27.0	26.9	26.3	25.4
12:00 - 13:00	26.2	25.0	26.1	26.2	26.7	27.2	26.4
13:00 - 14:00	27.1	25.4	25.2	27.1	26.9	25.6	26.2
14:00 - 15:00	26.7	26.9	25.2	26.2	27.8	26.7	26.4
15:00 - 16:00	25.7	27.3	26.2	25.6	26.0	26.6	25.7
16:00 - 17:00	27.7	27.2	26.1	26.9	27.6	27.2	27.3
17:00 - 18:00	27.1	27.6	26.6	29.0	27.4	26.8	26.9
18:00 - 19:00	26.9	28.4	25.7	26.3	27.4	26.9	27.8
19:00 - 20:00	26.7	26.7	26.2	26.6	27.6	25.6	27.0
20:00 - 21:00	26.2	27.5	24.4	24.9	26.3	27.1	28.1
21:00 - 22:00	24.0	26.3	25.4	23.5	24.7	27.2	26.7
22:00 - 23:00	26.1	27.2	25.6	26.4	27.0	28.7	29.9
23:00 - 0:00	26.0	23.8	27.8	25.1	26.8	27.0	23.4
10-12	25.1	25.4	25.7	26.8	26.7	26.5	25.9
14-16	26.6	27.9	26.0	25.7	27.4	27.3	26.6
0-24	27.0	27.0	26.1	26.8	27.2	26.8	27.0
7 DAY AVERAGE SPEED			23.0				
7 DAY AVERAGE 85th PERCENTILE			26.9				

Direction : EASTBOUND							
TIME PERIOD	85TH PERCENTILE						
	Thursday 07/10/2021	Friday 08/10/2021	Saturday 09/10/2021	Sunday 10/10/2021	Monday 11/10/2021	Tuesday 12/10/2021	Wednesday 13/10/2021
0:00 - 1:00	23.0	-	25.0	26.3	20.0	31.2	25.0
1:00 - 2:00	27.8	23.2	24.0	23.8	22.8	23.2	21.0
2:00 - 3:00	25.2	20.0	25.2	33.1	-	-	25.4
3:00 - 4:00	-	19.5	36.0	20.0	25.6	30.1	32.0
4:00 - 5:00	31.4	22.6	31.3	24.0	27.9	36.5	29.2
5:00 - 6:00	28.7	27.0	26.1	24.6	27.5	25.7	27.0
6:00 - 7:00	27.8	25.6	25.8	25.6	26.3	24.8	26.1
7:00 - 8:00	25.0	25.2	26.4	26.0	25.0	24.2	24.2
8:00 - 9:00	24.1	24.0	24.7	24.5	23.6	23.4	23.5
9:00 - 10:00	23.6	24.2	22.7	24.4	23.1	23.8	22.9
10:00 - 11:00	23.3	22.5	24.5	24.4	23.1	24.3	22.6
11:00 - 12:00	24.2	22.4	24.4	23.9	23.1	24.2	23.7
12:00 - 13:00	23.7	23.7	24.1	24.2	23.4	24.1	22.8
13:00 - 14:00	23.5	22.8	23.3	23.6	23.4	23.8	23.6
14:00 - 15:00	23.6	23.8	23.6	23.5	24.3	23.4	23.4
15:00 - 16:00	24.4	24.3	24.0	24.1	23.1	24.3	23.8
16:00 - 17:00	23.9	24.6	25.1	24.1	23.7	23.7	23.9
17:00 - 18:00	23.5	23.1	24.4	24.1	24.2	23.9	24.0
18:00 - 19:00	23.6	24.2	23.3	24.4	23.5	24.1	24.3
19:00 - 20:00	25.5	24.4	24.2	25.9	25.0	23.4	24.5
20:00 - 21:00	24.9	28.2	25.1	24.8	25.1	23.9	24.0
21:00 - 22:00	25.0	25.0	23.0	25.6	24.6	23.3	22.9
22:00 - 23:00	24.1	22.2	23.8	24.3	26.9	25.3	31.7
23:00 - 0:00	27.3	23.3	23.5	24.0	23.1	-	26.3
10-12	23.8	22.5	24.5	24.1	23.1	24.3	23.2
14-16	24.2	24.4	23.3	23.7	23.8	24.1	23.8
0-24	24.3	24.1	24.3	24.4	24.0	24.0	24.0
7 DAY AVERAGE SPEED			20.8				
7 DAY AVERAGE 85th PERCENTILE			24.1				

Automatic Classified Counts, Gresford							
DATE: 07/10/2021 TO 13/10/2021							
LOCATION: GRESFORD ROAD (WESTERN SITE)							
Direction : EASTBOUND							
TIME PERIOD	85TH PERCENTILE						
	Thursday 07/10/2021	Friday 08/10/2021	Saturday 09/10/2021	Sunday 10/10/2021	Monday 11/10/2021	Tuesday 12/10/2021	Wednesday 13/10/2021
0:00 - 1:00	-	-	21.7	25.5	17.0	29.2	23.0
1:00 - 2:00	27.0	21.2	20.5	20.8	20.4	20.0	-
2:00 - 3:00	28.2	18.0	22.2	31.4	-	-	19.0
3:00 - 4:00	-	15.4	33.0	17.0	28.0	29.6	21.0
4:00 - 5:00	28.2	25.4	28.3	21.0	24.9	34.5	13.0
5:00 - 6:00	27.1	27.5	23.1	23.3	25.6	25.0	-
6:00 - 7:00	25.6	24.7	23.0	28.7	24.2	22.4	30.0
7:00 - 8:00	22.8	23.0	23.9	22.3	22.5	22.6	26.4
8:00 - 9:00	22.2	21.7	22.7	21.9	20.7	21.5	26.0
9:00 - 10:00	22.1	22.6	19.9	21.3	20.4	22.2	27.9
10:00 - 11:00	23.3	21.3	22.4	21.5	20.1	23.2	25.4
11:00 - 12:00	22.0	20.4	21.7	21.1	19.9	23.0	26.9
12:00 - 13:00	22.5	23.2	21.6	21.4	20.9	22.1	24.6
13:00 - 14:00	22.8	21.3	20.3	21.2	21.8	22.0	25.4
14:00 - 15:00	22.1	21.3	21.6	21.4	21.7	21.4	22.6
15:00 - 16:00	23.7	22.6	21.2	21.7	20.9	22.6	25.4
16:00 - 17:00	22.5	23.0	21.3	20.2	20.9	21.6	21.8
17:00 - 18:00	21.8	21.5	22.1	22.6	20.9	22.1	24.3
18:00 - 19:00	22.5	22.9	20.5	21.8	20.8	23.0	20.3
19:00 - 20:00	23.3	22.6	22.4	23.8	23.1	21.6	23.9
20:00 - 21:00	24.6	26.5	22.3	22.2	25.7	22.9	21.6
21:00 - 22:00	23.1	23.7	21.3	24.8	24.1	21.0	23.3
22:00 - 23:00	24.1	21.3	23.3	21.3	21.9	24.5	24.5
23:00 - 0:00	26.7	22.5	22.3	25.8	20.1	-	24.3
10-12	22.6	20.8	22.0	21.2	20.0	23.1	26.2
14-16	23.2	22.4	20.9	21.5	21.3	22.1	24.5
0-24	22.8	22.5	21.7	22.0	21.5	22.4	26.2
7 DAY AVERAGE SPEED			19.1				
7 DAY AVERAGE 85th PERCENTILE			23.1				

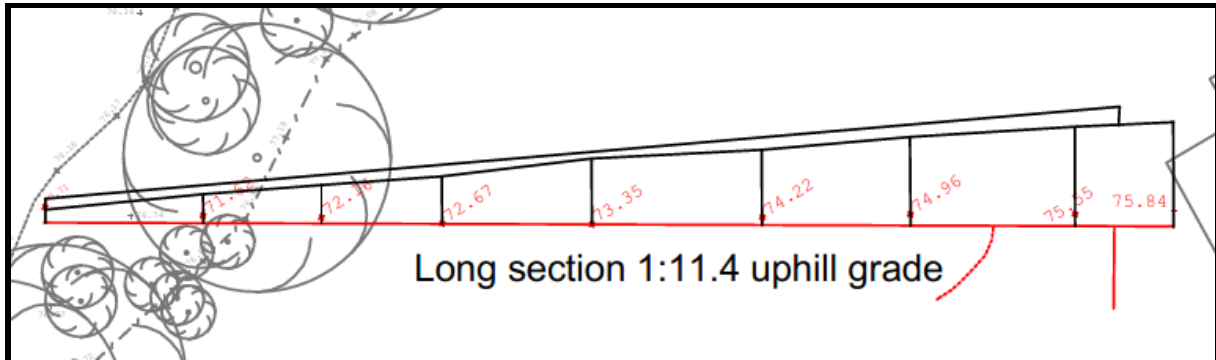
Direction : WESTBOUND							
TIME PERIOD	85TH PERCENTILE						
	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday
	07/10/2021	08/10/2021	09/10/2021	10/10/2021	11/10/2021	12/10/2021	13/10/2021
0:00 - 1:00	23.6	24.2	27.4	24.1	33.4	24.4	23.5
1:00 - 2:00	35.9	-	21.0	28.2	23.9	20.0	-
2:00 - 3:00	19.0	28.7	-	28.5	-	25.0	20.0
3:00 - 4:00	-	33.0	15.0	21.0	23.0	-	-
4:00 - 5:00	27.4	27.8	21.2	30.0	25.5	26.7	27.7
5:00 - 6:00	28.1	29.2	24.5	27.3	26.2	28.6	28.4
6:00 - 7:00	25.4	27.3	24.6	25.3	26.3	27.2	26.4
7:00 - 8:00	24.3	25.3	25.0	26.7	24.1	23.8	24.2
8:00 - 9:00	24.8	24.7	24.4	25.3	24.3	24.0	24.0
9:00 - 10:00	23.9	25.4	23.9	23.6	23.8	23.1	23.5
10:00 - 11:00	23.7	23.2	22.1	24.1	24.1	24.0	23.6
11:00 - 12:00	22.7	23.6	23.4	24.9	23.2	23.4	22.7
12:00 - 13:00	23.2	23.3	23.7	23.2	23.7	24.7	23.6
13:00 - 14:00	23.4	23.8	23.1	24.0	24.2	23.5	23.4
14:00 - 15:00	24.3	25.2	22.3	23.7	24.4	24.3	24.1
15:00 - 16:00	23.0	25.5	22.7	23.1	22.9	24.6	23.0
16:00 - 17:00	24.8	24.5	22.9	24.2	24.1	24.6	24.5
17:00 - 18:00	23.5	25.3	23.8	26.7	24.7	23.6	23.6
18:00 - 19:00	23.3	26.9	23.6	23.4	24.7	23.9	25.4
19:00 - 20:00	23.0	25.1	23.6	24.1	24.3	23.2	23.6
20:00 - 21:00	23.7	23.2	23.5	22.2	23.9	24.3	25.2
21:00 - 22:00	22.3	25.9	23.6	22.4	23.8	23.9	23.2
22:00 - 23:00	25.9	26.4	25.6	25.0	23.5	26.1	28.2
23:00 - 0:00	26.2	24.7	23.9	26.9	27.2	27.0	25.5
10-12	23.2	23.5	22.7	24.5	23.7	23.7	23.2
14-16	24.0	26.1	22.8	23.2	24.2	25.0	24.2
0-24	24.1	25.1	23.5	24.3	24.3	24.2	24.2
7 DAY AVERAGE SPEED		20.3					
7 DAY AVERAGE 85th PERCENTILE		24.3					



Profile shows NW bound slowing across the site access and down the hill to the bend. The SE bound up the hill shows an increase beyond where a vehicle would be inter visible and then reducing as they crest the hill to the junction location.

MFS sets out that the safe stopping distances that forms the basis of the sight line review can be affected by gradients i.e., uphill grades will have the effect of decreasing breaking distances and downhill grades increases braking distances.

7.5.9 Gradients affect stopping distances. The deceleration rate of 0.45g used to calculate the figures in Table 7.1 is for a level road. A 10% gradient will increase (or decrease) the rate by around 0.1g.



The levels provided show a 1:11 uphill grade.

The formula for the distances is set out below taking gradients into account.

The DMRB and MFS use the nationally accepted formulae but with different reaction times and deceleration factors.

7.5.3 The basic formula for calculating SSD (in metres) is:

$$SSD = vt + v^2/2d$$

where:

v = speed (m/s)

t = driver perception–reaction time (seconds)

d = deceleration (m/s²)

7.5.4 The desirable minimum SSDs used in the *Design Manual for Roads and Bridges* are based on a driver perception–reaction time of 2 seconds and a deceleration rate of 2.45 m/s² (equivalent to 0.25g where g is acceleration due to gravity (9.81 m/s²)). *Design Bulletin 32*¹⁷ adopted these values.

7.5.5 Drivers are normally able to stop much more quickly than this in response to an emergency. The stopping distances given in the Highway Code assume a driver reaction time of 0.67 seconds, and a deceleration rate of 6.57 m/s².

Using the above with the speeds and gradients the following stopping distances are derived, these are then used for the sight lines.

$V = 23.1 \times 1.609$ to kph = 37.17 kph = 37170/3600 to give 10.32 m/s.

$T = 2$ sec

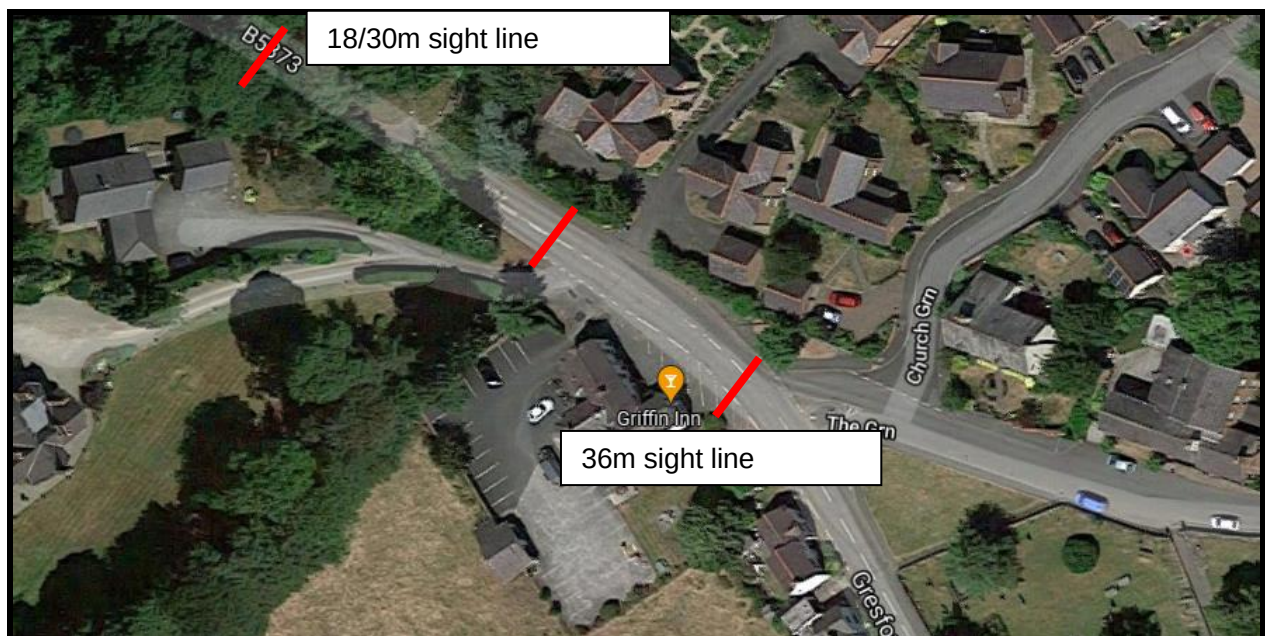
$D = 2.45$

Grade A = 11.4

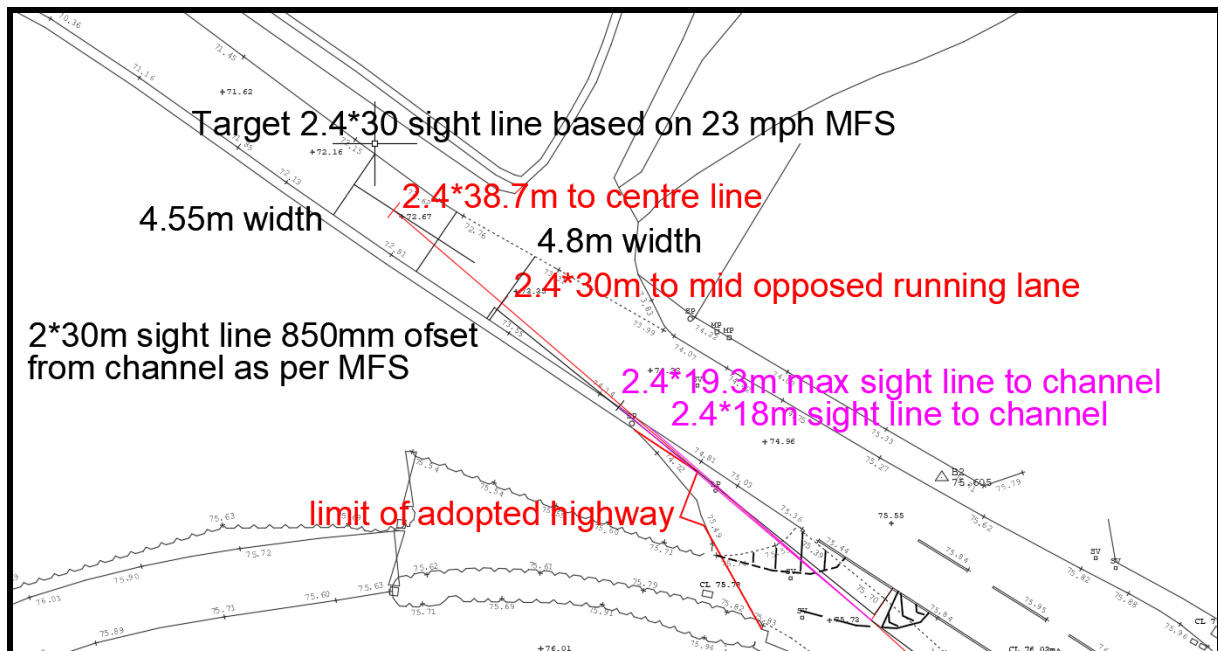
$10.32 \times 2 + (10.32 \times 10.32) / 2(2.45 + (0.1 \times 11.4)) = 20.65 + 106.5 / 7.18 = 18\text{m}$ for the left sight line.

Using MFS the following sight line distances are derived for the recorded speeds.

Speed			SSD (m)	SSD (m) Bonnet length
kp/h	mp/h	m/s		
28	17.4	7.78	19	21
29	18.0	8.06	19	22
30	18.6	8.33	20	23
31	19.3	8.61	21	24
32	19.9	8.89	22	25
33	20.5	9.17	23	26
34	21.1	9.44	24	27
35	21.7	9.72	25	28
36	22.4	10.00	26	29
37	23.0	10.28	27	30
38	23.6	10.56	28	31
39	24.2	10.83	30	32
40	24.9	11.11	31	33
41	25.5	11.39	32	34
42	26.1	11.67	33	35
43	26.7	11.94	34	36



To the right the full 36m and as shown a 50m distance is delivered within the adopted highway.



To the left the 30m distance is fully delivered to the mid point of the opposing running lane, 38.7m to the centre line and for the 18m gradient derived distance to the channel. Full details on fig 1.



The carriageway is 4.55 to 4.8m in width, narrower than the adjacent network, and is on a uphill grade

MfS states:

7.7.5 Some circumstances make it unlikely that vehicles approaching from the left on the main arm will cross the centreline of the main arm – opposing flows may be physically segregated at that point, for example. If so, the visibility splay to the left can be measured to the centreline of the main arm.

Paragraph 10.4.2 of MfS2 states “it has often been assumed that a failure to provide visibility at priority junctions in accordance with the values recommended in MfS1 or DMRB (as appropriate) will result in an increased risk of injury collisions. Research carried out by TMS Consultancy for MfS2 has found no evidence of this. Research into cycle safety at T-junctions found that higher cycle collision rates are associated with greater visibility”.

The second bullet point suggests that highway safety can actually be improved or certainly made no worse, with reduced levels of visibility. This is logical as it engenders greater care and caution for all highway users and is evidenced in the first bullet point which confirms no recorded accidents at this location within the study period.



It is therefore concluded that the sight line requirement and inter visibility between vehicles is levered and a safe access can be provided.

Traffic flows

The surveys also recorded the traffic flows across the day and week, abstract over leaf.

Automatic Classified Counts, Gresford



DATE: 07/10/2021 TO 13/10/2021

LOCATION: GRESFORD ROAD (WESTERN SITE)

Direction : EASTBOUND

Direction: EASTBOUND

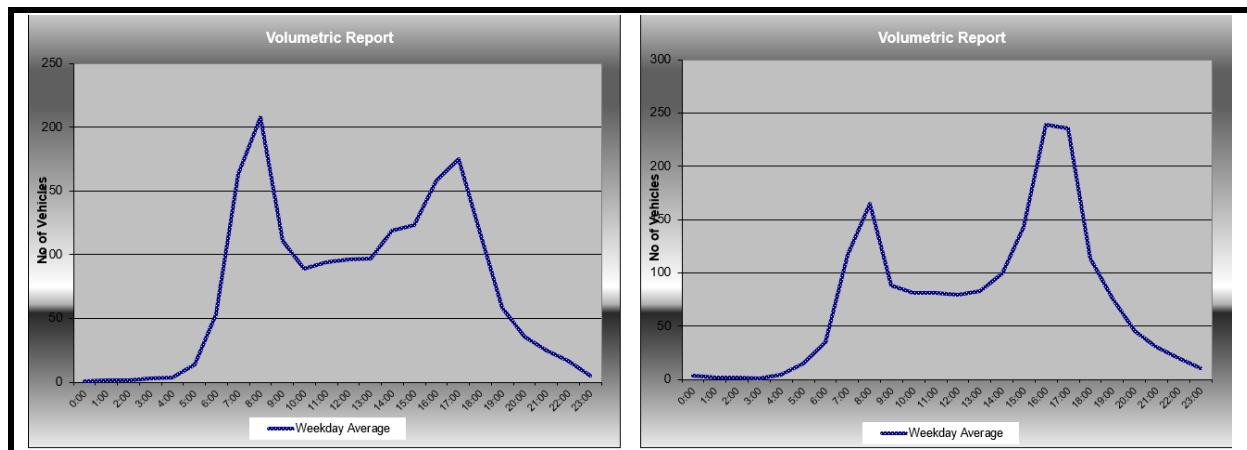
TIME PERIOD	VEHICLE VOLUMES								
	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Weekday	Week
	07/10/2021	08/10/2021	09/10/2021	10/10/2021	11/10/2021	12/10/2021	13/10/2021	Average	Average
0:00 - 1:00	1	0	4	15	1	3	1	1	4
1:00 - 2:00	2	3	3	8	2	2	1	2	3
2:00 - 3:00	2	2	2	7	0	0	3	1	2
3:00 - 4:00	0	5	3	3	4	3	1	3	3
4:00 - 5:00	3	6	3	1	2	3	3	3	3
5:00 - 6:00	13	12	7	13	18	19	22	14	15
6:00 - 7:00	46	47	20	13	60	55	57	53	43
7:00 - 8:00	146	153	34	20	162	182	166	163	123
8:00 - 9:00	232	177	57	38	199	210	222	208	162
9:00 - 10:00	115	97	95	54	116	120	105	111	100
10:00 - 11:00	63	80	96	69	104	89	100	89	86
11:00 - 12:00	81	111	112	94	85	91	97	94	96
12:00 - 13:00	99	77	118	113	95	93	104	96	100
13:00 - 14:00	88	101	113	94	97	104	87	97	98
14:00 - 15:00	117	153	88	80	106	106	108	119	108
15:00 - 16:00	119	163	61	78	100	116	115	123	107
16:00 - 17:00	154	158	84	100	161	158	150	158	138
17:00 - 18:00	179	185	73	81	164	190	156	175	147
18:00 - 19:00	114	113	90	57	130	118	109	118	104
19:00 - 20:00	48	70	58	31	48	52	67	58	53
20:00 - 21:00	34	39	30	23	26	48	25	36	32
21:00 - 22:00	27	22	30	20	28	19	23	25	24
22:00 - 23:00	13	27	23	5	15	17	9	17	16
23:00 - 0:00	5	13	17	6	2	0	5	5	7
7-19	1507	1568	1021	878	1519	1577	1519	1550	1370
6-22	1662	1746	1159	965	1681	1751	1691	1721	1522
6-24	1680	1786	1199	976	1698	1768	1705	1744	1545
0-24	1701	1814	1221	1023	1725	1798	1736	1768	1574

Direction : WESTBOUND

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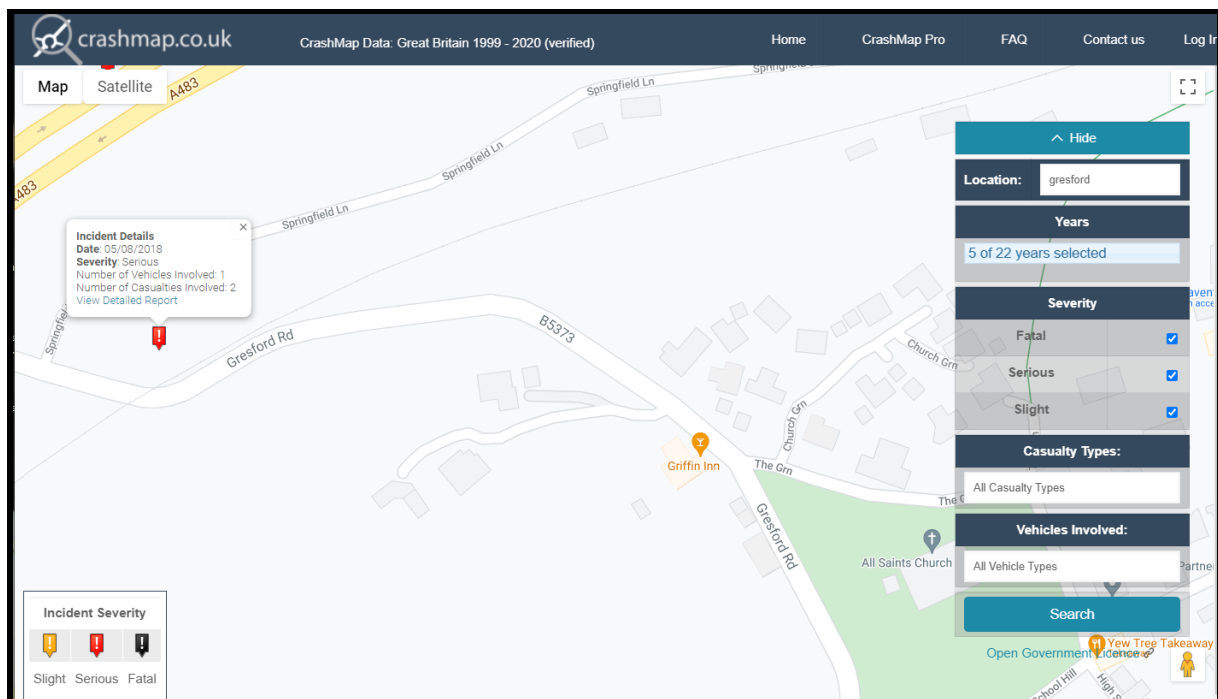
TIME PERIOD	VEHICLE VOLUMES								
	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Weekday	Week
	07/10/2021	08/10/2021	09/10/2021	10/10/2021	11/10/2021	12/10/2021	13/10/2021	Average	Average
0:00 - 1:00	4	4	6	14	3	2	3	3	5
1:00 - 2:00	3	0	2	4	3	1	0	2	2
2:00 - 3:00	1	5	0	6	0	1	1	2	2
3:00 - 4:00	1	3	1	2	1	1	0	1	1
4:00 - 5:00	5	4	2	3	4	2	4	4	3
5:00 - 6:00	9	11	7	5	23	15	16	15	12
6:00 - 7:00	24	25	10	9	44	34	38	35	26
7:00 - 8:00	98	128	26	19	131	122	105	117	90
8:00 - 9:00	128	143	44	26	204	168	180	165	128
9:00 - 10:00	95	68	71	56	81	92	97	88	80
10:00 - 11:00	60	73	82	63	90	75	98	81	77
11:00 - 12:00	65	82	80	75	84	80	90	81	79
12:00 - 13:00	70	78	92	112	95	75	74	80	85
13:00 - 14:00	77	96	64	83	75	75	80	83	79
14:00 - 15:00	74	102	62	69	99	118	103	99	90
15:00 - 16:00	121	169	79	66	139	135	147	143	122
16:00 - 17:00	201	251	85	104	256	246	234	239	197
17:00 - 18:00	216	233	92	69	255	218	255	236	191
18:00 - 19:00	93	116	67	88	116	103	129	113	102
19:00 - 20:00	69	76	62	46	73	86	70	76	69
20:00 - 21:00	34	42	16	14	32	38	73	45	36
21:00 - 22:00	13	43	16	18	29	33	29	30	26
22:00 - 23:00	18	21	16	11	14	25	22	20	18
23:00 - 0:00	4	18	14	6	6	9	6	11	9
7-19	1298	1539	844	830	1625	1507	1592	1524	1319
6-22	1438	1725	948	917	1803	1698	1802	1710	1476
6-24	1460	1764	978	934	1823	1732	1830	1741	1503
0-24	1483	1791	996	968	1857	1754	1854	1767	1529

Clearly from the profile the road is tidal in nature.



Flow profile tidal in nature

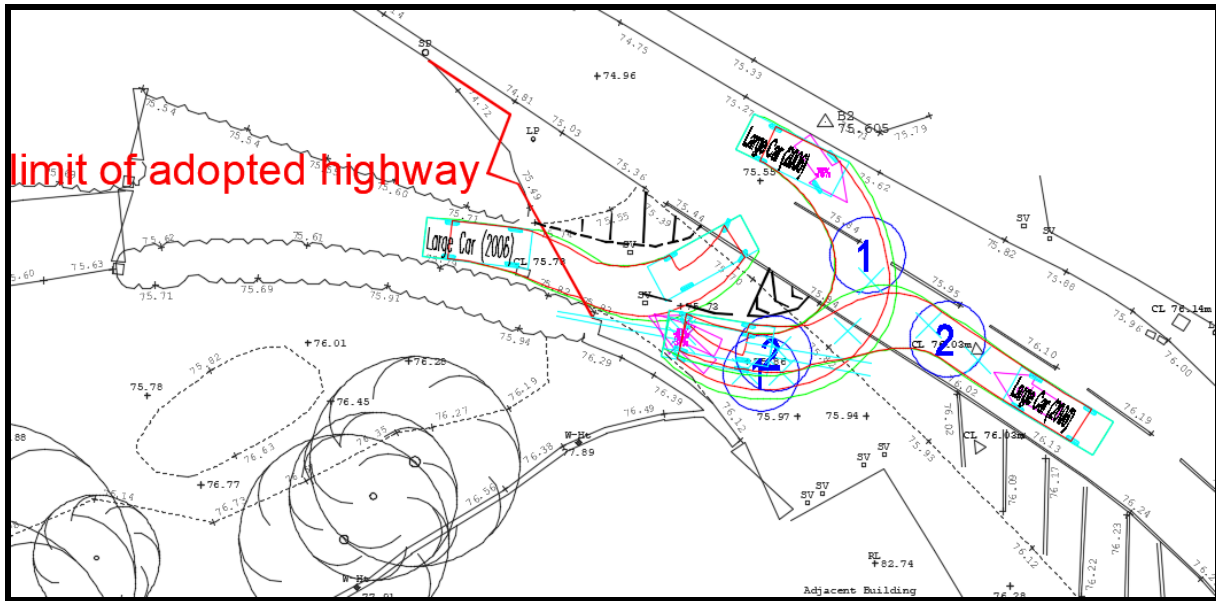
Safety records



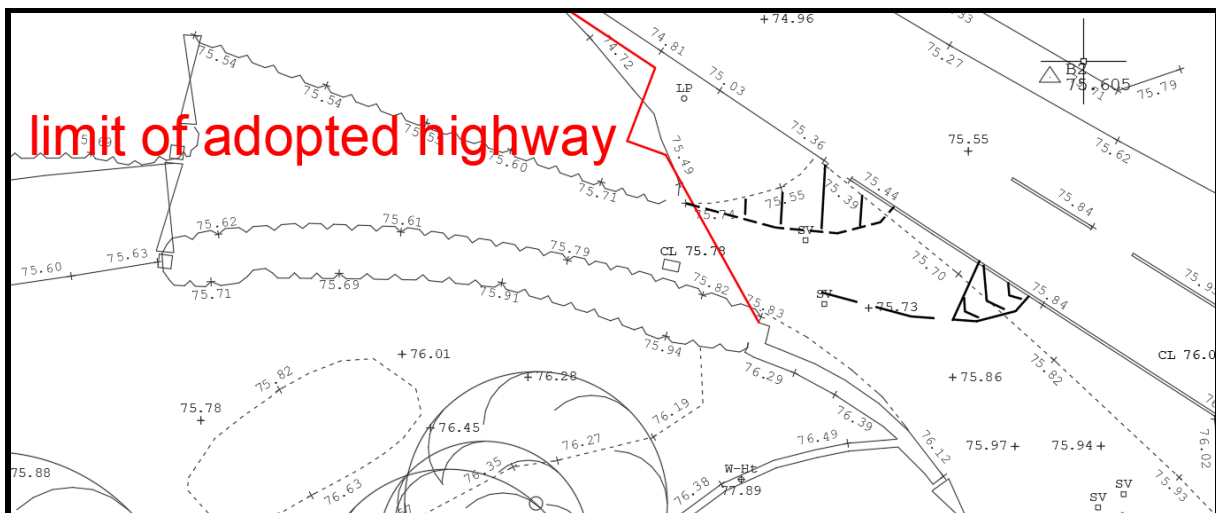
The national data base for the past 5 years shows no records adjacent to the site. This would suggest that the site already operates safety in though constrained and the local network can be said to operate in a safe manner.

Swept paths

Overleaf the in/out are shown with space for an in to wait until an out clears in the unlikely case it occurs on site.



The markings at the junction provide additional definition for the movements:



Trip generation

The proposed use for 1 unit would worst case generate 1 trip in the peak and say 7 across the day.

This combined with the approved 3 units would be 4 trips or 1 per 15 minutes with conflicts unlikely to occur.

As shown even if in/out conflicted there is space to allow a vehicle to wait on either side with no backing back onto the highway.

Summary

The reason for refusal based on lack of detail has been answered in full, conflict levels are very low and unlikely to occur with no blocking of the main line.

Whilst any change would give rise to increased potential impacts it is not considered that these would be severe or at a level where deemed unacceptable in nature, as such the application can be supported.

Alan Davies
DTPC

2021