CRCL/P/9/B

APPENDICES TO PROOF OF EVIDENCE OF MICHAEL FRASER

NOISE AND VIBRATION

THE CHILTERN RAILWAYS (BICESTER TO OXFORD IMPROVEMENTS) ORDER

TRANSPORT AND WORKS ACT 1992

TRANSPORT AND WORKS (APPLICATIONS AND OBJECTIONS PROCEDURE) (ENGLAND AND WALES) RULES 2006

ERM

Chiltern Railways

FINAL

27 SEPTEMBER 2010

BLANK FOR DIVIDER

Noise Monitoring Results

Additional Noise Monitoring Results

INTRODUCTION

1.1 An important consideration in assessing the noise impact of any proposal is the change in ambient noise levels that it produces at noise sensitive receptors. As part of the environmental statement, baseline noise monitoring was undertaken in the form of long term unattended surveys and short term attended measurement surveys.

1.2 Since the publication of the ES, further long term unattended monitoring has been carried out at several locations. These surveys have been used to increase the baseline coverage in some areas, notably in Islip and in the Wolvercote area of north Oxford where it is possible that the topography and road locations may result in significant differences in existing noise levels, particularly at locations that are further from the railway. Whilst the baseline used in the ES was chosen to ensure that noise impacts were not underestimated at the representative receptors shown in Figure 1.1 A to 1.1Q in Environmental Statement Volume 3 (Figures and Plans) (**CD/1.17**). The further noise monitoring that is reported in this section will be used in some cases to further inform residents of the effects of the Order Scheme. In other areas monitoring has been carried out in order to increase the level of detail in areas where significant numbers of residents have raised concerns regarding noise.

1.3 Additional noise monitoring has been carried out in June and August 2010, at the following locations:

- Whimbrel Close, Bicester;
- Mill Street, Islip;
- Lakeside, Oxford;
- Blenheim Drive, Oxford; and
- Stone Meadow, Oxford.

1.4 Noise monitoring was carried out at some of these locations in the ES (eg Lakeside), and the effect of any changes on the noise assessment has been considered in this Appendix. Monitoring at each location was carried out over a period of several days so that unusual events and bad weather could be excluded. A typical weekday baseline noise level was derived from these measurements.

METHODOLOGY

1.5 Measurements were made of the existing noise environment during the day-time and night-time in accordance with BS 7445 (1). Measurements were made at 4 m above the ground with the microphone mounted on a tripod to realistically represent the noise levels at upper floor heights. A Norsonic 116

(1) British Standard (BS) 7445: Description and measurement of environmental noise, Part 1, Guide to quantities and procedures (2003)

(Class 1) sound level meter was used. The meter was calibrated before use, and the calibration levels were checked after the survey. Deviations in levels were less than 1 dB was noted, which is satisfactory for this type of survey.

1.6 Weather data has been used from the nearby Met Office weather stations to identify periods where the measurements may have been adversely affected.

1.7 Data recorded at Blenheim Drive and Islip during periods of rain or when wind speeds exceeded 5 m/s have been compared with adjacent data recorded in good weather conditions. No significant difference was found and all noise data have been used.

1.8 Where rain or wind speed in excess of 5 m/s has been noted during measurements at Lakeside and Whimbrel Close, the noise data has been discarded because, in this case, the wind appeared to affect the noise measurements.

RESULTS

1.9 This section reports the results of the noise measurements. Table 1.1 to Table 1.10 below present the initial results from the additional noise measurement surveys.

1.10 Note that the measured baseline noise levels south of North Oxford Junction are used directly in the noise assessment in the ES. The results in Tables 1.1 and 1.2, relate to the houses at Stone Meadow, and the results are therefore quoted directly. For other locations, north of North Oxford Junction, the L_{Aeq} parameter has been presented for the situation with the existing trains included, and excluded. I have presented the data in this way to reflect the way in which baseline noise was used in the ES, and to allow direct comparison with the ES measurements. In the ES the train noise is predicted for the existing situation and added to the noise from background traffic and other sources.

1.11 In Table 1.1 the results at Stone Meadow gave a minimum of 60 dB L_{Aeq} during the day, and 53 dB L_{Aeq} at night. This was higher than that used in the ES (based on measurements at Cox's Ground) which were 55 dB L_{Aeq} during the day and 47 dB L_{Aeq} at night. This suggests that noise impacts will be lower than reported in the ES at this location.

1.12 In Table 1.3 the results at Blenheim Drive have been shown for all days as there was limited data that could be used from weekday measurements. This gave a minimum of 49 dB L_{Aeq} during the day on a weekend (no weekday daytime data was gathered here), and 45 dB L_{Aeq} at night. This was higher than that used in the ES (based on measurements at the nearest receptor at St Peter's Road) which were 48 dB L_{Aeq} during the day and 36 dB L_{Aeq} at night. However, this location is more exposed to distant noise sources which results in these higher levels, and so for the closest receptors to the track in Blenheim Drive, the measurements at St Peter's Road are expected to be the most reliable baseline data. This suggests that there will be no change to the assessment at the closest receptors to the railway, but that noise impacts will be substantially lower than reported in the ES at most properties in Blenheim

Drive which are further from the railway and which experience higher baseline noise levels.

1.13 In Table 1.5 at Lakeside all measurements were made on weekdays and gave a minimum of 52 dB L_{Aeq} during the day, and 48 dB L_{Aeq} at night. This was higher at night, but lower during the day, than that used in the ES (based on measurements at Lakeside) which were 56 dB L_{Aeq} during the day and 47 dB L_{Aeq} at night. This suggests that noise impacts will be lower than reported in the ES at this location as night-time impacts are larger than those during the day, and determine the overall impact.

1.14 In Table 1.7 at Islip all measurements were made on weekdays except for one night-time measurement 20-21st of August 2010 which has been excluded. The measurements that were included gave a minimum of 45 dB L_{Aeq} during the day, and 38 dB L_{Aeq} at night. This was higher at night, but lower during the day, than that used in the ES (based on measurements at the station house) which were 56 dB L_{Aeq} during the day and 47 dB L_{Aeq} at night. This suggests that noise impacts will be lower than reported in the ES at this location as night-time impacts are larger than those during the day, and determine the overall impact.

1.15 In Table 1.9 the results at Whimbrel Close all measurements were made on weekdays except for measurements on the 7th and 8th of August 2010 which has been excluded. The measurements that were included gave a minimum of 47 dB L_{Aeq} during the day, and 42 dB L_{Aeq} at night. This was slightly higher at night, and the same during the day, than that used in the ES which were 47 dB L_{Aeq} during the day and 41 dB L_{Aeq} at night. This suggests that noise impacts will be slightly lower than reported in the ES at this location as night-time impacts are larger than those during the day, and determine the overall impact.

Stone Meadow

Table 1.1 Day and Night-Time Period Measurements at Stone Meadow

Date	Time Period	Noise Level (free-field), $L_{Aeq,period}$ dB
12.08.2010- 13.08.2010	Night-time (2)	59
13.08.10	Day time (1)	60
15.08.10- 16.08.2010	Night-time (2)	53

(1) Daytime hours from 07.00 to 23.00
(2) Night-time hours from 23.00 to 07.00

Table 1.2 Unattended Measurement Survey Results at Stone Meadow

Date Start	Time	Duration (hours)	Noise Level (free-field), dB			
			$L_{Aeq,1h}$	$L_{max,1h\ (Slow)}$	$L_{A90,1h}$	$L_{A10,1h}$
2010/08/11	10:00:00.00	1	57.6	79.2	44.3	55.1
2010/08/11	11:00:00.00	1	59.6	83.9	44.1	51.7
2010/08/11	12:00:00.00	1	58.5	77.3	44.5	60.3
2010/08/11	13:00:00.00	1	59.6	81.3	43.7	55.5
2010/08/11	14:00:00.00	1	58.5	80.2	43.3	56.5
2010/08/11	15:00:00.00	1	57.3	79.2	42.6	51.4
2010/08/11	16:00:00.00	1	57.9	81.1	43.2	55
2010/08/11	17:00:00.00	1	57.2	79.3	43.6	50.7
2010/08/11	18:00:00.00	1	65.5	96.7	43.5	53.2
2010/08/11	19:00:00.00	1	59.2	80	42.5	62.5
2010/08/11	20:00:00.00	1	57.8	78.2	41	52.9
2010/08/11	21:00:00.00	1	58.5	77.6	40.1	44.8
2010/08/11	22:00:00.00	1	57.1	78.4	39.2	53.6
2010/08/12	23:00:00.00	1	53.2	78.2	41.5	45.4
2010/08/13	00:00:00.00	1	58.5	84.7	41.9	45.7
2010/08/13	01:00:00.00	1	58.8	84.5	41.3	45.3
2010/08/13	02:00:00.00	1	48.3	71.2	40.3	44
2010/08/13	03:00:00.00	1	57	81.2	39.6	44.7
2010/08/13	04:00:00.00	1	59.2	81.8	42.9	46.5
2010/08/13	05:00:00.00	1	57.7	82.9	45	49
2010/08/13	06:00:00.00	1	63.5	84.5	47.7	51.7
2010/08/13	07:00:00.00	1	59.7	79.7	50	53.6
2010/08/13	08:00:00.00	1	58.8	82.2	46.8	51.2
2010/08/13	09:00:00.00	1	60.2	77.8	46.2	63.2

Date Start	Time	Duration (hours)			Noise Level (free-field), dB	
2010/08/13	10:00:00.00	1	61.6	86.1	46	52
2010/08/13	11:00:00.00	1	58.6	87.5	45.6	50.3
2010/08/13	12:00:00.00	1	59.1	79	44.7	61.8
2010/08/13	13:00:00.00	1	61.5	90.4	45	61.2
2010/08/13	14:00:00.00	1	59.6	78.1	45.2	60.4
2010/08/13	15:00:00.00	1	59.8	81	42.2	55.4
2010/08/13	16:00:00.00	1	58.9	80.8	42.6	50.2
2010/08/13	17:00:00.00	1	61.8	87.6	43	51.5
2010/08/13	18:00:00.00	1	61.4	83.6	43.2	63.3
2010/08/13	19:00:00.00	1	60.8	82.9	42.7	52.8
2010/08/13	20:00:00.00	1	59.8	80.3	43.5	49.3
2010/08/13	21:00:00.00	1	59.5	85.1	43.6	48.2
2010/08/13	22:00:00.00	1	56.1	78.6	40.2	54.3
2010/08/13	23:00:00.00	1	56.8	81.9	38.8	42.4
2010/08/14	23:00:00.00	1	45.8	74.1	34.3	38.8
2010/08/15	00:00:01.00	1	33.9	42.6	30.9	36
2010/08/15	01:00:01.00	1	37.9	65.9	29.6	40.7
2010/08/15	02:00:01.00	1	34.4	55.2	27.6	37.8
2010/08/15	03:00:01.00	1	31.1	42.4	27.1	33.9
2010/08/15	04:00:01.00	1	32.7	46.5	28.7	34.7
2010/08/15	05:00:01.00	1	37.5	52.4	31.2	40.6
2010/08/15	06:00:01.00	1	39.5	51.6	35.2	42.2
2010/08/15	07:00:01.00	1	41	54.4	37.6	43.2
2010/08/15	08:00:01.00	1	43.8	55.5	37.5	47.1
2010/08/15	09:00:00.00	1	55.8	79.4	39.4	51.4
2010/08/15	10:00:00.00	1	56.3	79.2	38.9	49
2010/08/15	11:00:00.00	1	55.8	80.7	38.6	50.6
2010/08/15	12:00:00.00	1	58.6	80.5	39.4	54
2010/08/15	13:00:00.00	1	54.2	79.6	39.2	51
2010/08/15	14:00:00.00	1	66.1	98.6	39.6	49.8
2010/08/15	15:00:00.00	1	56	78.8	38.3	49.5
2010/08/15	16:00:00.00	1	53.6	76.7	37.8	45.6
2010/08/15	17:00:00.00	1	57.5	80.3	38.3	48.1
2010/08/15	18:00:00.00	1	58.2	80.7	39.3	52.2
2010/08/15	19:00:00.00	1	54.5	77.3	39.9	46.2
2010/08/15	20:00:00.00	1	58	80	40.7	44.5
2010/08/15	21:00:00.00	1	57.3	83.4	40.4	43.4
2010/08/15	22:00:00.00	1	52.4	78.3	37.2	43.3
2010/08/15	23:00:00.00	1	33	54.6	30.2	33.6
2010/08/16	00:00:01.00	1	34.7	51.7	28.9	36.1

Date Start	Time	Duration (hours)			Noise Level (free-field), dB	
2010/08/16	01:00:01.00	1	33.5	48.5	29.7	36.2
2010/08/16	02:00:01.00	1	37.4	52.3	34.8	39.3
2010/08/16	03:00:01.00	1	37.5	43	34.5	39.4
2010/08/16	04:00:01.00	1	55.3	81	38.3	42.6
2010/08/16	05:00:00.00	1	58.5	82.6	41	47.2
2010/08/16	06:00:00.00	1	57.3	78.3	46.1	49.9
2010/08/16	07:00:00.00	1	57.3	80.9	44.9	49.7
2010/08/16	08:00:00.00	1	58	82.1	43.1	49.3
2010/08/16	09:00:00.00	1	60	80.9	42.1	62.8
2010/08/16	10:00:00.00	1	59	81.2	41.7	61
2010/08/16	11:00:00.00	1	59.3	81.4	41.8	48.4
2010/08/16	12:00:00.00	1	57.7	80.3	42.5	61.1
2010/08/16	13:00:00.00	1	57.8	80.8	43.1	58.6
2010/08/16	14:00:00.00	1	57.6	78.9	43.8	53.4

Blenheim Drive

Table 1.3 Day and Night-Time Period Measurements at Blenheim Drive

Date	Time Period	Noise Level (free-field), $L_{Aeq,period}$ dB
27.08.2010- 28.07.10	Night-time (2)	47
28.08.2010	Day time (1)	49
28.07.10- 29.07.08	Night-time (2)	46
29.07.2010	Day time (1)	49
29.07.2010-30.07.2010	Night-time (2)	45

(1) Daytime hours from 07.00 to 23.00
(2) Night-time hours from 23.00 to 07.00

Table 1.4 Unattended Measurement Survey Results at Blenheim Drive

Date Start	Time	Duration (hours)	Noise Level (free-field), dB					
			$L_{Aeq,1h}$ (train noise subtracted)	$L_{Aeq,1h}$ (train noise contribution)	$L_{Aeq,1h}$ (total noise)	$L_{max,1h\ (fast)}$	$L_{A90,1h}$	$L_{A10,1h}$
2010/07/27	23:00:00.00	1	43.7	41.7	45.5	64.4	38.1	42.1
2010/07/28	00:00:00.00	1	41.7	0	41.7	62.8	37	41.8
2010/07/28	01:00:00.00	1	46.3	0	46.3	67	36.2	41.9
2010/07/28	02:00:00.00	1	42.4	0	42.4	64	36	40.8
2010/07/28	03:00:00.00	1	44	0	44	65.5	35.4	41.1
2010/07/28	04:00:00.00	1	51.5	0	51.5	70.5	39.1	45
2010/07/28	05:00:00.00	1	45.6	42.2	47.2	60.8	44.1	48.9
2010/07/28	06:00:00.00	1	48.8	39.1	49.2	61.3	46.6	50.7
2010/07/28	07:00:00.00	1	49.8	38.1	50.1	72.2	45.3	50.4
2010/07/28	08:00:00.00	1	47.5	43.2	48.9	64.7	44.3	50.9
2010/07/28	09:00:00.00	1	48.3	43.3	49.5	67.6	43.6	52.8
2010/07/28	10:00:00.00	1	44.8	47.4	49.3	68.5	43	50.3
2010/07/28	11:00:00.00	1	46.7	42.2	48	74.1	43.3	48.6
2010/07/28	12:00:00.00	1	48.6	48.4	51.5	73.5	43.5	49.6
2010/07/28	13:00:00.00	1	48.9	40.4	49.6	67.5	43.6	50
2010/07/28	14:00:00.00	1	48.7	46.9	51.2	73.9	44.8	51.8
2010/07/28	15:00:00.00	1	51.4	42.3	51.9	65.4	44.6	56
2010/07/28	16:00:00.00	1	51.7	0	51.7 [(a)]	70.6	44.3	53
2010/07/28	17:00:00.00	1	47.4	47.2	50.3 [(a)]	66.1	44.9	52.3
2010/07/28	18:00:00.00	1	48.2	41.2	49	63.3	45	49.9
2010/07/28	19:00:00.00	1	47.1	38.9	47.7	68	41.9	48.1
2010/07/28	20:00:00.00	1	42.6	37.1	43.7	59.6	35.9	43.4
2010/07/28	21:00:00.00	1	44.4	38.5	45.4	60.8	40.4	46.9
2010/07/28	22:00:00.00	1	43.7	0	43.7	61.2	40.1	43.3
2010/07/28	23:00:00.00	1	43.1	35.4	43.8	63.9	38.9	43.2
2010/07/29	00:00:00.00	1	46.3	0	46.3	66	37.8	43.2
2010/07/29	01:00:00.00	1	42	0	42	63.3	36	41.7
2010/07/29	02:00:00.00	1	40.4	0	40.4	57.4	36.9	41.2
2010/07/29	03:00:00.00	1	46.3	0	46.3	65	35.5	41.2
2010/07/29	04:00:00.00	1	45.8	0	45.8	66.2	38	42.2
2010/07/29	05:00:00.00	1	44.3	42.5	46.5	66.1	40	45.9
2010/07/29	06:00:00.00	1	48.9	40	49.4	73.9	43	48.7
2010/07/29	07:00:00.00	1	47.1	37.5	47.5	60.7	44.3	48.8
2010/07/29	08:00:00.00	1	46.4	42.4	47.9	63.5	43.8	49.7

Date Start	Time	Duration (hours)	Noise Level (free-field), dB					
2010/07/29	09:00:00.00	1	47	36.8	47.4	67	41.8	51
2010/07/29	10:00:00.00	1	46.7	41.2	47.8	66.9	42.1	49.3
2010/07/29	11:00:00.00	1	47.4	41.9	48.5	61.9	44	51.4
2010/07/29	12:00:00.00	1	48.6	36.7	48.9	66.4	42.7	50.8
2010/07/29	13:00:00.00	1	48.2	42.9	49.3	68	43.1	49.9
2010/07/29	14:00:00.00	1	49.8	45.6	51.2	64.8	43.4	55.7
2010/07/29	15:00:00.00	1	48.6	0	49.6	66	43.2	52.8
2010/07/29	16:00:00.00	1	48.6	0	48.6	61.7	43.1	51.8
2010/07/29	17:00:00.00	1	48	41	48.8	65	43.5	51
2010/07/29	18:00:00.00	1	47.7	42	48.7 [(a)]	65.9	44.2	50.1
2010/07/29	19:00:00.00	1	47.3	40.4	48.1	66.5	43.1	48.9
2010/07/29	20:00:00.00	1	49.9	39.2	50.3	81.9	42.6	49.1
2010/07/29	21:00:00.00	1	44.3	40	45.7	62.5	41.2	46.2
2010/07/29	22:00:00.00	1	48.3	0	48.3	73.1	41.1	45.2
2010/07/29	23:00:00.00	1	41.8	40	44	60.3	39.6	44.2
2010/07/30	00:00:01.00	1	42.4	0	42.4	61.3	38	42.7
2010/07/30	01:00:00.00	1	41.9	0	41.9	62.2	36.7	41.1
2010/07/30	02:00:00.00	1	39.2	0	39.2	54.1	35.9	40.7
2010/07/30	03:00:00.00	1	46.7	0	46.7	68.3	36.1	44.1
2010/07/30	04:00:00.00	1	45.6	0	45.6	67.6	39.9	44
2010/07/30	05:00:00.00	1	47.2	47	50.1	65.7	42.3	50.8
2010/07/30	06:00:00.00	1	51	42.8	51.6	62.9	47.4	53.5

(a) Data recorded during periods of rain or when wind speeds exceeded 5 m/s have been compared with adjacent data recorded in good weather conditions. No significant difference was found and all noise data have been used.

Lakeside

Table 1.5 Day and Night-Time Period Measurements at Lakeside

Date	Time Period	Noise Level (free-field), $L_{Aeq,period}$ dB
12.07.2010-13.07.2010	Night-time (2)	48
13.07.10	Day time (1)	52
13.07.2010- 14.07.2010	Night-time (2)	51
14.07.2010	Day time (1)	54
14.07.2010- 15.07.2010	Night-time (2)	54

(1) Daytime hours from 07.00 to 23.00
(2) Night-time hours from 23.00 to 07.00

Table 1.6 Unattended Measurement Survey Results at Lakeside

Date Start	Time	Duration (hours)	Noise Level (free-field), dB					
			$L_{Aeq,1h}$ (train noise subtracted)	$L_{Aeq,1h}$ (train noise contribution)	$L_{Aeq,1h}$ (total noise)	$L_{max,1h\ (Slow)}$	$L_{A90,1h}$	$L_{A10,1h}$
2010/07/12	23:00:00.00	1	44.4	38.5	45.4	51.7	41.2	47.9
2010/07/13	00:00:01.00	1	43.9	0	43.9	52.4	38	46.8
2010/07/13	01:00:00.00	1	43.6	0	43.6	55.5	36.8	47
2010/07/13	02:00:00.00	1	42.2	0	42.2	51.6	34.9	45.5
2010/07/13	03:00:00.00	1	40.3	0	40.3	48.6	34.4	43.5
2010/07/13	04:00:01.00	1	53.8	0	53.8	76.7	37.4	55.4
2010/07/13	05:00:00.00	1	45.8	36.3	46.3	60.3	42.6	48.6
2010/07/13	06:00:00.00	1	49.3	44.4	50.5	74.5	46.2	50
2010/07/13	07:00:00.00	1	47.9	43.5	49.3	71.5	46.9	49.8
2010/07/13	08:00:00.00	1	47.2	46.8	50	73.5	46.3	49.6
2010/07/13	09:00:00.00	1	50.1	40.9	50.6	73.3	44.7	48.9
2010/07/13	10:00:00.00	1	46.5	44.9	48.8	71.8	44.2	47.9
2010/07/13	11:00:00.00	1	48.2	45.3	50	71.9	45.2	49
2010/07/13	12:00:00.00	1	46.5	50.0	51.6	72.3	43.5	47.7
2010/07/13	13:00:00.00	1	45.3	44.9	48.1	73.5	43.1	47.6
2010/07/13	14:00:00.00	1	47.5	47.7	50.6	74.6	44.4	49.2
2010/07/13	15:00:00.00	1	52.8	47.1	53.8	77.1	46.1	54.9
2010/07/13	16:00:00.00	1	49.6	45.3	51	74.1	47	52.1
2010/07/13	17:00:00.00	1	53.1	38	53.3	77.9	47	52.1
2010/07/13	18:00:00.00	1	53.7	47.8	54.7	73.2	50.2	56

Date Start	Time	Duration (hours)	Noise Level (free-field), dB					
2010/07/13	19:00:00.00	1	54.3	43	54.6	75.3	52	55.7
2010/07/13	20:00:00.00	1	52.7	45.5	53.5	70.5	50.1	55.3
2010/07/13	21:00:00.00	1	52.3	45.7	53.2	73	49.4	54.5
2010/07/13	22:00:00.00	1	51	0	51	59.2	48.1	53.1
2010/07/13	23:00:00.00	1	49.8	0	49.8	56.1	46.1	52.2
2010/07/14	00:00:00.00	1	47.6	0	47.6	54.9	43.7	50.2
2010/07/14	01:00:00.00	1	46	0	46	52.6	41.8	48.8
2010/07/14	02:00:00.00	1	44.2	0	44.2	52.8	38.9	47.1
2010/07/14	03:00:00.00	1	55.2	0	55.2	80.7	39.8	47.6
2010/07/14	04:00:00.00	1	54.2	0	54.2	73.3	41.8	58.2
2010/07/14	05:00:00.00	1	47.3	49.1	51.3	74.6	43.3	50.1
2010/07/14	06:00:00.00	1	51.3	40.7	51.7	69	47.6	53.2
2010/07/14	07:00:00.00	1	51.8	46.1	52.8	74.5	49.9	53.3
2010/07/14	08:00:00.00	1	50.8	46.8	53.3	75	50.4	53.7
2010/07/14	09:00:00.00	1	51.3	49.4	53.5	72	49.9	54.3
2010/07/14	10:00:00.00	1	52.2	48.1	53.6	74.3	50.2	54.4
2010/07/14	11:00:00.00	1	51.7	48.6	53.4	75.3	50.2	54.3
2010/07/14	12:00:00.00	1	46.4	48.6	54.3	73.6	50.8	54.3
2010/07/14	13:00:00.00	1	52	53.2	53.9	73.2	50.9	54.8
2010/07/14	14:00:00.00	1	53.5	46.7	54.8	72.1	50.8	56.1
2010/07/14	15:00:00.00	1	53	46	53.8 [(a)]	77.1	46.1	54.9
2010/07/14	16:00:00.00	1	53.9	46.5	51 [(a)]	74.1	47	52.1
2010/07/14	17:00:00.00	1	53	45.2	53.3 [(a)]	77.9	47	52.1
2010/07/14	18:00:00.00	1	55.5	50.2	54.7 [(a)]	73.2	50.2	56
2010/07/14	19:00:00.00	1	56.7	47.6	54.6 [(a)]	75.3	52	55.7
2010/07/14	20:00:00.00	1	55.2	52.6	57.1	76.8	53.6	57.8
2010/07/14	21:00:00.00	1	54.2	47.9	55.1	74.1	51.7	56.6
2010/07/14	22:00:00.00	1	51.9	0	51.9	60.5	48.9	53.9
2010/07/14	23:00:00.00	1	49.4	43.5	50.4	63.5	47.3	52.4
2010/07/15	00:00:00.00	1	48.7	0	48.7	61.1	44.3	51.3
2010/07/15	01:00:00.00	1	50.1	0	50.1	58.5	45.4	53
2010/07/15	02:00:00.00	1	49.9	0	49.9	57.1	44.8	52.9
2010/07/15	03:00:00.00	1	55.8	0	55.8	80.6	45.2	53.3
2010/07/15	04:00:00.00	1	52.9	0	52.9	59.2	49.1	55.3
2010/07/15	05:00:00.00	1	55.3	43.5	56.1	78.1	51.5	57.5
2010/07/15	11:00:00.00	1	58.2	53.5	59.5	78	57.1	60.5
2010/07/15	12:00:00.00	1	59.4	51.1	60	72.8	58.1	61.2

(a) For these hours, no valid data was recorded due to meteorological conditions.

Islip

Table 1.7 Day and Night-Time Period Measurements at Islip

Date	Time Period	Noise Level (free-field), $L_{Aeq,period}$ dB
18.08.2010- 19.08.2010	Night-time [2]	38
19.08.2010	Day time [1]	45
19.08.2010- 20.08.2010	Night-time [2]	40
20.08.2010	Day time [1]	47
20.08.2010- 21.08.2010	Night-time [2]	42

(1) Daytime hours from 07.00 to 23.00
(2) Night-time hours from 23.00 to 07.00

Table 1.8 Unattended Measurement Survey Results at Islip

Date Start	Time	Duration (hours)	Noise Level (free-field), dB				
			$L_{Aeq,1h}$ (train noise subtracted)	$L_{Aeq,1h}$ (train noise contribution)	$L_{Aeq,1h}$ (total noise)	$L_{A90,1h}$	$L_{A10,1h}$
2010/08/18	23:00:00.00	1	38.7	0	39.1	36.5	40.9
2010/08/19	00:00:01.00	1	37.3	0	37.2	34.6	39.1
2010/08/19	01:00:01.00	1	37.9	0	38	34.7	40.2
2010/08/19	02:00:01.00	1	38	0	38	34.3	40.2
2010/08/19	03:00:01.00	1	38.2	0	37.8	34.4	39.9
2010/08/19	04:00:01.00	1	39.3	0	39.6	37	41.4
2010/08/19	05:00:01.00	1	41.2	0	41	38.3	42.7
2010/08/19	06:00:01.00	1	44.4	0	44.2	42.1	45.6
2010/08/19	07:00:00.00	1	45.2	0	45.3	43.7	46.7
2010/08/19	08:00:00.00	1	42.4	0	42.5	39.9	44.2
2010/08/19	09:00:00.00	1	42.2	0	42.3	39.2	44.4
2010/08/19	10:00:00.00	1	44.3	0	43.9	39.4	45.9
2010/08/19	11:00:00.00	1	46.2	0	46.4	39.9	48.1
2010/08/19	12:00:00.00	1	46.4	40.3	47.1	41.1	48.6
2010/08/19	13:00:00.00	1	45.1	37.9	46	40	47.9
2010/08/19	14:00:00.00	1	46.1	0	46.2	41.2	48.2
2010/08/19	15:00:00.00	1	45.1	0	45	40.2	47.4
2010/08/19	16:00:00.00	1	44.5	0	44.7[a]	41.3	47.1
2010/08/19	17:00:00.00	1	49.1	0	49.1[a]	40	46.6
2010/08/19	18:00:00.00	1	45.1	0	44.8[a]	40.2	46.7

Date Start	Time	Duration (hours)	Noise Level (free-field), dB				
2010/08/19	19:00:00.00	1	43.2	0	43.5[(a)]	40.4	45.6
2010/08/19	20:00:00.00	1	40.7	0	40.9[(a)]	37.5	43.2
2010/08/19	21:00:01.00	1	40.7	0	40.8	36.9	43.9
2010/08/19	22:00:01.00	1	39.2	0	39	36.6	41
2010/08/19	23:00:01.00	1	39.2	0	39	36	41
2010/08/20	00:00:01.00	1	36.7	0	37.3	34.4	38.9
2010/08/20	01:00:01.00	1	43	0	43	34.8	46.8
2010/08/20	02:00:00.00	1	37.9	0	38	34.2	39.6
2010/08/20	03:00:01.00	1	36.5	0	36.6	33.7	38.6
2010/08/20	04:00:01.00	1	38.3	0	38.3	35.1	39.9
2010/08/20	05:00:01.00	1	39.3	0	39	36.4	40.8
2010/08/20	06:00:01.00	1	42.3	0	42.2	39.4	44
2010/08/20	07:00:00.00	1	43.5	0	43.5	41.2	45
2010/08/20	08:00:00.00	1	43.2	0	43.2	41.1	44.5
2010/08/20	09:00:00.00	1	43.3	0	43.2	41	45.1
2010/08/20	10:00:00.00	1	46.3	0	46	41.4	47.4
2010/08/20	11:00:00.00	1	46.2	0	46.2	42.5	48.9
2010/08/20	12:00:00.00	1	49.3	0	49.2	44	52.1
2010/08/20	13:00:00.00	1	49.3	0	49.9	44.6	52.9
2010/08/20	14:00:00.00	1	50.6	0	50.3	44.9	53.3
2010/08/20	15:00:00.00	1	48.8	0	49.3	42.5	52.7
2010/08/20	16:00:00.00	1	49.5	0	49.4	44.1	52.4
2010/08/20	17:00:00.00	1	49.2	0	49.2	44	51.5
2010/08/20	18:00:00.00	1	49.9	0	50.1	43	51.8
2010/08/20	19:00:00.00	1	44.3	0	44.3	41.1	46.7
2010/08/20	20:00:00.00	1	44.4	0	44.6	39.6	44.6
2010/08/20	21:00:00.00	1	39	0	39.2	36.9	40.8
2010/08/20	22:00:01.00	1	39	0	39.1	36.1	41.5
2010/08/20	23:00:01.00	1	40.1	0	39.9	36.1	42.2
2010/08/21	00:00:01.00	1	38.9	0	39.1	35.7	41.5
2010/08/21	01:00:01.00	1	37.2	0	37.1	33.7	39.5
2010/08/21	02:00:01.00	1	39	0	39.2	34.8	42.5
2010/08/21	03:00:01.00	1	38.9	0	38.7	34.6	41.4
2010/08/21	04:00:01.00	1	49.1	0	49.1	34.6	40.9
2010/08/21	05:00:00.00	1	40.8	0	40.6	36.9	43
2010/08/21	06:00:01.00	1	42.1	0	42.1	39.2	44.5
2010/08/21	23:00:01.00	1	37.5	0	37.5	34.3	39.8
2010/08/22	00:00:01.00	1	36.5	0	36.2	33.2	38.4
2010/08/22	01:00:01.00	1	33.8	0	34.2	31.1	36.5

Date Start	Time	Duration (hours)	Noise Level (free-field), dB				
2010/08/22	02:00:01.00	1	34.1	0	34.1	30.1	36.8
2010/08/22	03:00:01.00	1	49.7	0	49.7	32.3	53.7
2010/08/22	04:00:00.00	1	34.4	0	34.3	30.6	36.6
2010/08/22	05:00:01.00	1	38.2	0	38	32.7	41.2
2010/08/22	06:00:01.00	1	40.6	0	40.1	37.1	42.1

(a) Data recorded during periods of rain or when wind speeds exceeded 5 m/s have been compared with adjacent data recorded in good weather conditions. No significant difference was found and all noise data have been used.

Whimbrel Close

Table 1.9 Day and Night-Time Period Measurements at Whimbrel Close

Date	Time Period	Noise Level (free-field), $L_{Aeq,period}$ dB
04.08.2010- 05.08.2010	Night-time (2)	42
05.08.2010	Day time (1)	48
05.08.2010- 06.08.2010	Night-time (2)	42
06.08.2010	Day time (1)	40
06.08.2010- 07.08.2010	Night-time (2)	46
07.08.2010	Day time (1)	40
07.08.2010- 08.08.2010	Night-time (2)	45
08.08.2010	Day time (1)	43

(1) Daytime hours from 07.00 to 23.00
(2) Night-time hours from 23.00 to 07.00

Table 1.10 Unattended Measurement Survey Results at Whimbrel Close

Date Start	Time	Duration (hours)	Noise Level (free-field), dB					
			$L_{Aeq,1h}$ (train noise subtracted)	$L_{Aeq,1h}$ (train noise contribution)	$L_{Aeq,1h}$ (total noise)	$L_{max,1h\ (Slow)}$	$L_{A90,1h}$	$L_{A10,1h}$
2010/08/04	22:00:00.00	1	43.5	0	43.5	62.1	35.9	45.7
2010/08/04	23:00:00.00	1	39.1	0	39.1	51.8	34	42.4
2010/08/05	00:00:01.00	1	37.8	0	37.8	51.3	33	40.9
2010/08/05	01:00:01.00	1	36.4	0	36.4	52.1	30.1	38.7
2010/08/05	02:00:01.00	1	35.4	0	35.4	54.6	30.2	36
2010/08/05	03:00:01.00	1	37.1	0	37.1	54.7	31.8	39
2010/08/05	04:00:01.00	1	38.4	0	38.4	53	32.6	40.9
2010/08/05	05:00:01.00	1	43.9	0	43.9	56.9	36.5	47.5
2010/08/05	06:00:00.00	1	47.5	0	47.5	60.1	43.5	49.9
2010/08/05	07:00:00.00	1	49.2	0	49.2	64.6	45.2	51.5
2010/08/05	08:00:00.00	1	49.3	0	49.3	62.4	44.6	52.1
2010/08/05	09:00:00.00	1	52.4	0	52.4	61.7	44.6	56.8
2010/08/05	10:00:00.00	1	47.5	0	47.5	56.9	44.2	49.5
2010/08/05	11:00:00.00	1	47.7	0	47.7	62.7	43.7	49.5
2010/08/05	12:00:00.00	1	47.7	0	47.7	57.2	44.5	49.8
2010/08/05	13:00:00.00	1	47.7	0	47.7 [(a)]	56	44.5	50
2010/08/05	14:00:00.00	1	48	0	48 [(a)]	59	44.4	50.3
2010/08/05	15:00:00.00	1	46.8	0	46.8 [(a)]	56.7	43.7	48.8
2010/08/05	16:00:00.00	1	47.7	0	47.7 [(a)]	57.5	44.3	50.1
2010/08/05	17:00:00.00	1	47.5	0	47.5	59.7	44.3	49.4
2010/08/05	18:00:00.00	1	46.8	0	46.8	56.6	43.2	49.1
2010/08/05	19:00:00.00	1	47.8	0	47.8	66.8	42.2	49.2
2010/08/05	20:00:00.00	1	45.3	0	45.3	62.3	39.5	47.9
2010/08/05	21:00:00.00	1	43.3	0	43.3	64.1	36.7	45.2
2010/08/05	22:00:00.00	1	40.3	0	40.3	51.9	33.8	44.2
2010/08/05	23:00:01.00	1	39.1	0	39.1	54.5	32	42.9
2010/08/06	00:00:01.00	1	37.6	0	37.6	56.1	30.8	40.8
2010/08/06	01:00:01.00	1	37.4	0	37.4	52.4	30.5	40
2010/08/06	02:00:01.00	1	36.8	0	36.8	52.3	29.8	39.7
2010/08/06	03:00:01.00	1	34.8	0	34.8	48.4	30.4	36.4
2010/08/06	04:00:01.00	1	38.7	0	38.7	56	33.2	41.1
2010/08/06	05:00:01.00	1	43.6	42.7	46.2	68.7	38.6	47.2

Date Start	Time Dura	tion (hours)	Noise Level (free-field), dB					
2010/08/06	06:00:00.00	1	47.1	0	47.1	59.3	43.5	49.3
2010/08/06	07:00:00.00	1	47.9	0	47.9	62	44.7	49.9
2010/08/06	08:00:00.00	1	46.6	0	46.6	56.1	43.4	48.7
2010/08/06	09:00:00.00	1	47	0	47	59.4	43.4	49.2
2010/08/06	10:00:00.00	1	46.9	0	46.9	55.7	43.7	49
2010/08/06	11:00:00.00	1	49.5	0	49.5	69.8	44	49.7
2010/08/06	12:00:00.00	1	47.4	0	47.4	58.8	44.3	49.6
2010/08/06	13:00:00.00	1	48.4	0	48.4	69	44.1	49
2010/08/06	14:00:00.00	1	46.7	0	46.7	58.2	43.9	48.6
2010/08/06	15:00:00.00	1	47.1	0	47.1	60.4	44.5	48.9
2010/08/06	16:00:00.00	1	47.5	0	47.5	55.6	44.8	49.5
2010/08/06	17:00:00.00	1	46.5	0	46.5	59.8	43.9	48.3
2010/08/06	18:00:00.00	1	46.1	0	46.1	57.3	42.4	48.5
2010/08/06	19:00:00.00	1	44.6	0	44.6	55.8	40.7	47
2010/08/06	20:00:00.00	1	42.5	47.9	49	73.7	37.8	46.2
2010/08/06	21:00:00.00	1	41.5	0	41.5	53.6	36.6	44.6
2010/08/06	22:00:01.00	1	40.1	0	40.1	50.6	35.2	43.4
2010/08/06	23:00:01.00	1	42.7	0	42.7	66.6	35.2	45.4
2010/08/07	00:00:01.00	1	39	0	39	53.8	33.7	42.2
2010/08/07	01:00:01.00	1	37.5	0	37.5	55.6	30.6	41.5
2010/08/07	02:00:01.00	1	38.5	0	38.5	54.9	30.7	41.9
2010/08/07	03:00:01.00	1	36.3	0	36.3	50.6	30.6	39.2
2010/08/07	04:00:01.00	1	37.7	0	37.7	55.6	31.1	39.2
2010/08/07	05:00:01.00	1	40.1	0	40.1	57.2	34.7	43
2010/08/07	06:00:00.00	1	43.6	0	43.6	63.3	37.7	46.1
2010/08/07	07:00:00.00	1	44	0	44	55.2	39.2	47.1
2010/08/07	08:00:00.00	1	44.7	0	44.7	56.1	40.3	47.3
2010/08/07	09:00:00.00	1	45.5	0	45.5	55.4	41.5	47.9
2010/08/07	10:00:00.00	1	46.2	0	46.2	58.2	42.9	48.2
2010/08/07	11:00:00.00	1	47.7	0	47.7	64.3	43.4	50.3
2010/08/07	12:00:00.00	1	47.2	0	47.2	63.4	43.1	48.7
2010/08/07	13:00:00.00	1	47.4	0	47.4	67.1	41.7	47.5
2010/08/07	14:00:00.00	1	45.4	0	45.4	57.2	41	47.8
2010/08/07	15:00:00.00	1	46.8	0	46.8	61.9	42.4	49.4
2010/08/07	16:00:00.00	1	46.2	0	46.2	57.8	41.7	48.5
2010/08/07	17:00:00.00	1	47.7	0	47.7	56.9	43.4	50.1
2010/08/07	18:00:00.00	1	46.3	0	46.3	63.9	41.4	48.4

Date Start	Time Dura	tion (hours)	Noise Level (free-field), dB					
2010/08/07	19:00:00.00	1	45.9	0	45.9	61.7	40	48.5
2010/08/07	20:00:00.00	1	43.7	0	43.7	63.9	38.1	46.5
2010/08/07	21:00:00.00	1	43	0	43	59.1	37.5	45.9
2010/08/07	22:00:01.00	1	42.8	0	42.8	57	35.3	46.3
2010/08/07	23:00:01.00	1	40.5	0	40.5	54.4	33.7	44
2010/08/08	00:00:01.00	1	40.3	0	40.3	53.2	33.2	44.1
2010/08/08	01:00:00.00	1	39.2	0	39.2	55.2	31.8	43
2010/08/08	02:00:01.00	1	40.2	0	40.2	59.2	31.5	44.3
2010/08/08	03:00:01.00	1	38.6	0	38.6	52.8	30.7	42.5
2010/08/08	04:00:01.00	1	36	0	36	54.4	29.8	38.5
2010/08/08	05:00:01.00	1	38.1	0	38.1	54.3	31	41.5
2010/08/08	06:00:01.00	1	42.4	0	42.4	61.2	32.9	45.5
2010/08/08	07:00:00.00	1	40.6	0	40.6	58.2	32.4	44.1
2010/08/08	08:00:01.00	1	43.9	0	43.9	66.4	35	46.3
2010/08/08	09:00:00.00	1	45.2	0	45.2	64.8	38.6	48.6
2010/08/08	10:00:00.00	1	49.1	0	49.1	69.9	42.4	49.3
2010/08/08	11:00:00.00	1	46.9	0	46.9	62.2	41.1	50
2010/08/08	12:00:00.00	1	45.1	0	45.1	59.2	40.5	47.5
2010/08/08	13:00:00.00	1	50.4	0	50.4	63.1	41.1	55.8
2010/08/08	14:00:00.00	1	43.9	0	43.9	58.6	39.4	46.5
2010/08/08	15:00:00.00	1	43.1	0	43.1	63.6	36.8	45.2
2010/08/08	16:00:00.00	1	43.3	0	43.3	56.4	36.6	46.1
2010/08/08	17:00:00.00	1	43.7	0	43.7	59.1	36.5	46.8
2010/08/08	18:00:00.00	1	42.4	0	42.4	62.2	36.2	45
2010/08/08	19:00:01.00	1	41.6	0	41.6	55.9	33.8	44.6
2010/08/08	20:00:01.00	1	43.9	0	43.9	61.9	34.1	46.1
2010/08/08	21:00:01.00	1	41.6	0	41.6	65.1	34.6	44.2
2010/08/08	22:00:01.00	1	40.8	0	40.8	64.2	33.7	43.2
2010/08/08	23:00:01.00	1	49.4	0	49.4	65.4	31.5	53.7
2010/08/09	00:00:01.00	1	33.8	0	33.8	48	28.3	36.7
2010/08/09	01:00:01.00	1	34	0	34	50.6	28.8	35.8
2010/08/09	02:00:01.00	1	33.3	0	33.3	52.2	27.4	34.6
2010/08/09	03:00:01.00	1	34.2	0	34.2	49.9	28.2	36.1
2010/08/09	04:00:01.00	1	35.6	0	35.6	54.2	31.1	37.4
2010/08/09	05:00:01.00	1	38.1	44	45	62.1	34.5	49.1
2010/08/09	06:00:00.00	1	46.7	0	46.7	62.7	41.6	49.7

Date Start	Time Duration (hours)	Noise Level (free-field), dB

(a) For these hours, no valid data was recorded due to meteorological conditions.

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Noise Modelling Results

Noise Modelling Results

INTRODUCTION

2.1 Whilst the ES presents a robust assessment of the impacts of the Order Scheme on the affected receptors, the complexity of geometry and ground form is better modelled at receptors further from the track using a 3 dimensional noise model. This work is being carried out, and some provisional results in a key are (North Oxford) have been reported below.

2.2 The same train service and example barrier locations have been adopted for this work, although it is expected that this model will be used to further assist in informing objectors of specific noise levels at their properties. This information will be available to the Inquiry.

2.3 Modelling has shown good agreement with the results reported in the ES at North Oxford in the mitigated and unmitigated case. The results also show that the impacts predicted in the ES at Quadrangle House slightly overestimated the impact at the upper floors. Since this is an unusual building, the heights of buildings have been checked as part of this exercise. The updated results are shown in Table 2.1 and 2.1 for unmitigated and mitigated situations.

2.4 An additional receptor at “Blenheim Drive / wider Wolvercote” has also been added. This is to represent the location at which noise monitoring has been undertaken in Blenheim Drive (south of the closest properties to the railway, and further back from the railway). The results for this receptor show that a noise barrier may not be required except to shield the closest properties to the railway in Blenheim Drive. This will be taken into account when determining the end point of the barrier, or equivalent mitigation in this area.

Table 2.1 Predicted Noise Levels and Increases in Ambient Noise with no Mitigation (dBA) As a Result of Phase 2

Receptor	Baseline noise levels		Predicted train noise levels as a result of the Scheme		Resulting total level (Predicted Train noise and Ambient Noise)		Exceedence of Day / Night Thresholds		Change in noise level as a Result of the Scheme		Predicted Impact	ES Predicted Impact
	Daytime ($L_{Aeq,16h}$)	Night-time ($L_{Aeq,8h}$)	Daytime ($L_{Aeq,16h}$)	Night-time ($L_{Aeq,8h}$)	Daytime ($L_{Aeq,16h}$)	Night-time ($L_{Aeq,8h}$)	Daytime ($L_{Aeq,16h}$)	Night-time ($L_{Aeq,8h}$)	Daytime ($L_{Aeq,16h}$)	Night-time ($L_{Aeq,8h}$)		
14 Lakeside	55	50	63	62	63	62	8	17	9	12	12	12
15 Wolvercote Primary School	45	n/a	51	n/a	52	n/a	0	n/a	7	n/a	0	4
15a Blenheim Drive / wider Wolvercote	49	45	48	46	52	49	0	4	3	4	4	n/a
16 Quadrangle House, St. Peters Road	55	49	62	61	62	61	7	16	7	12	12	12

Table 2.2 Predicted Noise Levels and Increases in Ambient Noise with Noise Mitigation (dBA) As a Result of Phase 2

Receptor	Baseline noise levels		Predicted train noise levels as a result of the Scheme		Resulting total level (Predicted Train noise and Ambient Noise)		Exceedence of Day / Night Thresholds		Change in noise level as a Result of the Scheme		Predicted Impact	ES Predicted Impact
	Daytime ($L_{Aeq,16h}$)	Night-time ($L_{Aeq,8h}$)	Daytime ($L_{Aeq,16h}$)	Night-time ($L_{Aeq,8h}$)	Daytime ($L_{Aeq,16h}$)	Night-time ($L_{Aeq,8h}$)	Daytime ($L_{Aeq,16h}$)	Daytime ($L_{Aeq,16h}$)	Night-time ($L_{Aeq,8h}$)	Daytime ($L_{Aeq,16h}$)		
14 Lakeside	55	50	50	50	54	52	0	7	0	2	2	2
15 Wolvercote Primary School	45	n/a	45	n/a	48	n/a	0	n/a	3	n/a	0	<1
15a Blenheim Drive / wider Wolvercote	49	45	42	40	50	46	0	1	1	1	1	n/a
16 Quadrangle House, St. Peters Road	55	49	58	54	58	54	3	9	3	5	5	8

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Vibration Monitoring Results

Vibration Monitoring Surveys

INTRODUCTION

3.1 Vibration measurements were carried out between the 13th July and the 11th August, 2010, at four residential properties. These are listed below, along with their NSR (noise sensitive receptor) number, which may be used to identify them on the figures 6.1A to 6.1 Q in Volume 3 of the Environmental Statement (**CD/1.17**).

- NSR 16.St. Peter's Road (Quadrangle House);
- NSR 11.Kareol;
- NSR 3. Whimbrel Close; and
- NSR 8. Oddington Crossing.

3.2 The surveys were carried out in order to:

- establish baseline levels of vibration; and
- establish whether these were of a level that may cause building damage;

3.3 At NSR 16 (Quadrangle House), a series of measurement surveys were carried out, and the purpose of these is described below.

3.4 The results are described in terms of two parameters used in the ES. These are VDV, which is used to establish the potential for disturbance, and PPV which is used to assess the potential for building damage.

NSR 16 - QUADRANGLE HOUSE

3.5 Vibration measurements were carried out at Quadrangle House, St. Peters road, in Wolvercote (Oxford), between the 26th July and the 3rd August, 2010.

3.6 Measurements were made in three locations; in the basement, close to the wall facing the railway, and in a residential property on the second floor at the same end of the building, again close to the wall facing the railway.

3.7 The survey was carried out in order to;

- establish baseline levels of vibration in the building;
- establish whether these were of a level that may cause building damage; and
- investigate if the design of the building caused vibrations to be unusually amplified at the upper floors.

METHODOLOGY

3.8 One minute PPV (Peak Particle Velocity) measurements were continuously logged using a Profound Vibra or a Vibrock v901 vibration meter. At the same time, one minute VDV (Vibration Dose Value) samples were recorded using a Rion VM-54 vibration meter.

3.9 Measurements were made inside residential properties at the closest point to the railway. The measurements were made for vibration in three perpendicular axes (x, y and z). The VDV results are reported for the z axis, which is in the vertical direction, and represents the highest value recorded for the VDV samples. The PPV values are the highest of all three axes.

3.10 At Quadrangle House, measurements were taken in a residential room on the second floor over four days from the 26th to the 29th July 2010. In the basement, measurements were made over three days from the 29th to the 31st July, and over two further days from the 2nd to the 3rd August, 2010. The measurements include a measurement of a train carrying stone at the basement level.

RESULTS

QUADRANGLE HOUSE

3.11 The results of the VDV measurements at Quadrangle House are summarised below in Table 3.1, along with an assessment of human response according to BS6472 (2) (**CD/5.26**). The survey shows the levels of vibration are below the level at which adverse comment is likely.

3.12 The results of the PPV measurements at Quadrangle House are summarised in Table 3.2. The results indicate that vibration levels are amplified at the tope of the top floor (2nd storey) by the building response. PPV measurements made at the second storey level are in the region of twice the magnitude of those made at the basement level. This is not unusual however, and whilst the measurements indicate that individual train movements are likely to be perceptible within the building, the vibration they produce is well below the level at which building damage is likely to occur (15 mm/s).

Table 3.1 Summary of VDV Measurements at Quadrangle House

Date / Time of Measurement Period	Period	VDV, (Z) m/s $^{1.75}$	Assessment of Human Response
2nd Storey Measurement Location			
26.07.10 2300 - 27.07.10 0700	Night	0.02	No impact
27.07.10 0700 - 27.07.10 2300	Day	0.03	No impact
27.07.10 2300 - 28.07.10 0700	Night	0.02	No impact
28.07.10 0700 - 28.07.10 2300	Day	0.04	No impact
28.07.10 2300 - 29.07.10 0700	Night	0.04	No impact
Basement Measurement Location			
29.07.10 2300 - 30.07.10 0700	Night	0.03	No impact
30.07.10 0700 - 30.07.10 2300	Day	0.04	No impact
30.07.10 2300 - 31.07.10 0700	Night	0.04	No impact
02.08.10 2300 - 03.08.10 0700	Night	0.03	No impact

(2) British Standard BS6472-1:2008 Guide to the evaluation of human exposure to vibration in buildings

Table 3.2 Summary of PPV Measurements at Quadrangle House

Date	Time Period	Maximum PPV (mm/s)
2nd Storey Measurement Location		
26/07/2010	16.00 - midnight	1.6
27/07/2010	24h period	0.9
28/07/2010	24h period	1.9
29/07/2010	midnight - 14.30	1.0
Basement Measurement Location		
29/07/2010	15.30 - midnight	0.2
30/07/2010	24h period	1.0
31/07/2010	24h period	0.1
01/08/2010	24h period	0.2
02/08/2010	24h period	0.7
03/08/2010	midnight - 15.00	0.4

NSR 11 – KAREOL

3.13 The results of the VDV measurements at Kareol are summarised below in Table 3.3, along with an assessment of human response according to BS6472 (3). The survey shows the levels of vibration are below the level at which adverse comment is likely.

3.14 The results of the PPV measurements at Kareol are summarised in Table 3.4. The results indicate that individual train movements are likely to be perceptible within the building, however the vibration they produce is well below the level at which building damage is likely to occur (15 mm/s).

Table 3.3 Summary of VDV Measurements at Kareol

Date / Time of Measurement Period	Period	VDV, (Z) m/s $^{1.75}$	Assessment of Human Response
13.07.10 2300 - 14.07.10 0700	Night	0.06	No impact
14.07.10 0700 - 14.07.10 2300	Day	0.05	No impact
14.07.10 2300 - 15.07.10 0700	Night	0.05	No impact

Table 3.4 Summary of PPV Measurements at Kareol

Date	Time Period	Maximum PPV (mm/s)
13/07/2010	12.30 - midnight	0.8
14/07/2010	24h period	1.2
15/07/2010	midnight – 17.00	2.5

NSR 3 – WHIMBREL CLOSE

3.15 The results of the VDV measurements at Whimbrel Close are summarised below in Table 3.5, along with an assessment of human response according to BS6472. The survey shows the levels of vibration are below the level at which adverse comment is likely.

(3) British Standard BS6472-1:2008 Guide to the evaluation of human exposure to vibration in buildings

3.16 The results of the PPV measurements at Whimbrel Close are summarised in Table 3.6. The results indicate that individual train movements are likely to be perceptible within the building, however the vibration they produce is well below the level at which building damage is likely to occur (15 mm/s).

Table 3.5 Summary of VDV Measurements at Whimbrel Close

Date / Time of Measurement Period	Period	VDV, (Z) m/s $^{1.75}$	Assessment of Human Response
04.08.10 2300 - 05.08.10 0700	**Night**	**0.00**	No impact
05.08.10 0700 - 05.08.10 2300	**Day**	**0.01**	No impact
05.08.10 2300 - 06.08.10 0700	**Night**	**0.01**	No impact
06.08.10 0700 - 06.08.10 2300	**Day**	**0.01**	No impact
06.08.10 2300 - 07.08.10 0700	**Night**	**0.00**	No impact
07.08.10 0700 - 07.08.10 2300	**Day**	**0.00**	No impact
07.08.10 2300 - 08.08.10 0700	**Night**	**0.00**	No impact
08.08.10 0700 - 08.08.10 2300	**Day**	**0.01**	No impact
08.08.10 2300 - 09.08.10 0700	**Night**	**0.00**	No impact

Table 3.6 Summary of PPV Measurements at Whimbrel Close

Date	Time Period	Maximum PPV (mm/s)
04/08/2010	18.45 - midnight	2.7
05/08/2010	24h period	1.3
06/08/2010	24h period	1.9
07/08/2010	24h period	0.6
08/08/2010	24h period	1.1
09/08/2010	midnight - 17.20	2.1

NSR 8 – ODDINGTON CROSSING

3.17 The results of the VDV measurements at Oddington Crossing are summarised below in Table 3.7, along with an assessment of human response according to BS6472 (4). The survey shows that current levels of vibration are at a level where adverse comment is possible.

3.18 The results of the PPV measurements at Oddington Crossing are summarised in Table 3.8. The results indicate that individual train movements are likely to be perceptible within the building, however the vibration they produce is well below the level at which building damage is likely to occur (15 mm/s).

(4) British Standard BS6472-1:2008 Guide to the evaluation of human exposure to vibration in buildings

Table 3.7 Summary of VDV Measurements at Oddington Crossing

Date / Time of Measurement Period	Period	VDV, (Z) m/s $^{1.75}$	Assessment of Human Response
04.08.10 2300 - 05.08.10 0700	Night	0.11	Low probability
05.08.10 0700 - 05.08.10 2300	Day	0.21	Low probability
05.08.10 2300 - 06.08.10 0700	Night	0.12	Low probability
06.08.10 0700 - 06.08.10 2300	Day	0.24	Adverse comment possible
06.08.10 2300 - 07.08.10 0700	Night	0.10	Low probability
07.08.10 0700 - 07.08.10 2300	Day	0.18	Low probability
07.08.10 2300 - 08.08.10 0700	Night	0.00	No impact
08.08.10 0700 - 08.08.10 2300	Day	0.16	Low probability
08.08.10 2300 - 09.08.10 0700	Night	0.10	Low probability
09.08.10 0700 - 09.08.10 2300	Day	0.20	Adverse comment possible
09.08.10 2300 - 10.08.10 0700	Night	0.13	Low probability
10.08.10 0700 - 10.08.10 2300	Day	0.22	Adverse comment possible
10.08.10 2300 - 11.08.10 0700	Night	0.12	Low probability

Table 3.8 Summary of PPV Measurements at Oddington Crossing

Date	Time Period	Maximum PPV (mm/s)
04/08/2010	11.00 - midnight	3.5
05/08/2010	24h period	2.3
06/08/2010	24h period	3.0
07/08/2010	24h period	2.1
08/08/2010	24h period	1.8
09/08/2010	24h period	3.4
10/08/2010	24h period	2.8
11/08/2010	midnight - 12.00	2.1

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Standard Responses to Objectors

Standard Responses to Objectors

INTRODUCTION

4.1 The majority of the objections received from local residents were received in the form of a standard tick sheet, based on a proforma, provided by Engage. The following paragraphs respond to the standard tick sheet form. The bold italic typeface headings are statements that appear on the tick sheet; the responses below the headings are standard answers to the statements. I believe these to be correct responses to the issues that have been raised by these objectors.

"Individual concerns have not been properly addressed"

4.2 Chiltern Railways has been committed to engaging local residents throughout the process of preparing the application for the Order Scheme. An extensive public consultation exercise has taken place including exhibitions, newsletters, infomails and a website. A hotline has been made available so that residents can contact a dedicated consultation team. The consultation team had detailed discussions on specific points with many residents who live close to the Order Scheme, before the application was submitted.

4.3 Since submission of the application to the Department for Transport in January 2010, there has been continued consultation with local residents. This included a meeting held for north Oxford residents on 25th March 2010. Chiltern Railways has and will continue to address specific concerns that residents raise.

"Since the start of the consultation process, there has been an incremental and significant increase in numbers of trains, new passenger timetable (May 2009), trains on Sundays, more freight trains"

4.4 Passenger timetables are reviewed twice yearly, so as to match train services with emerging market needs. The enhanced service introduced in May 2009, including Sunday trains, resulted from an agreement between First Great Western and Oxfordshire County Council. This is part of the County Council's wider policy of improving public transport services into Oxford. Chiltern Railways is not currently the operators of the Bicester to Oxford line, and was not involved in that agreement.

4.5 The number of freight trains on any railway line depends on contracts between the freight train companies and their customers, and on the demand for the goods being moved. There have been no new freight contracts affecting the Bicester to Oxford line agreed recently, but, there will be day-to-day variation in the number of trains, due, for example, to the changing demand for construction aggregates or military supplies. Chiltern Railways does not operate freight trains and will not be involved in the operation of freight trains on this line in future.

4.6 The current passenger and freight timetable including the most recent changes has been taken into account when describing the environmental impacts of the Order Scheme.

"The new track will bring trains closer to my property which will increase noise and vibration"

4.7 As part of the Order Scheme, the line from Oxford North Junction towards Bicester will be re-laid as double track. Although this effectively replaces a track which was taken up some years ago, the location of the nearest track will change compared to its current location. This is referred to as the "new" line in the paragraphs below, which describes the changes at the closest properties.

4.8 At the southern end of Ulfgar Road, the existing track is on east side of the trackbed, so the "new" line will be on the west side (i.e. the Ulfgar Road side). In this location the "new" track will be approximately 4 m nearer the boundary of the railway corridor, but this is only for a short distance affecting a few houses.

4.9 From Blenheim Drive/St Peters Road through Wolvercote tunnel to Carey Close, the existing single track is in the centre of the trackbed, so that when this is replaced with double track, the "new" line will be no more than 2 m nearer the boundary of the railway corridor on either side.

4.10 From Linkside northwards, past Lakeside, the existing track is on the east side of the trackbed, i.e. the side nearest the houses. The "new" line will thus be on the west side, away from the houses, so the proximity of the nearest track to the Lakeside houses will not be changed.

4.11 Changes at other locations along the route are discussed in Volume 1 of the Environmental Statement (ES) where the Order Scheme is described.

4.12 Although the track is being re-laid closer to existing residential property in some cases, the noise from individual trains passing will only be slightly greater. The repositioning of the tracks is a smaller component of the change in train noise at most locations than the increase in the frequency of passenger and freight trains and changes in speed. All of the factors including the type of train that will be used have been taken into account in the noise assessment and mitigation strategy.

4.13 The noise assessments reported in the Environmental Statement have been carried out at the three locations, called receptors, which are closest to the tracks and are representative of those properties that are likely to be most affected by noise increases. The receptors used in North Oxford were numbers 14 (Lakeside), 15 (Wolvercote Primary School) and 16 (St Peters Road).

4.14 The predicted noise levels at these receptors, with and without the Order Scheme, are presented in the ES (Volume 2, Table 6.13 on page 6-35). These houses are already exposed to railway and road traffic noise, and this has been taken into account in the ES.

4.15 Since noise from the Order Scheme will affect people both in terms of how noticeable the noise changes are and how loud the noise is, noise has been assessed taking both of these factors into account. The factor that best describes the effect of the noise from the trains in the area being considered is used to determine the noise impact. In urban areas the change from existing

ambient noise level tends to be the determinant of the effects of noise. In more rural areas, with very low ambient noise levels, how loud the noise is in isolation tends to be the determinant of the effect of noise on people. In these areas, the noise from the trains is compared to an absolute threshold level and the impact is assessed based on the amount by which the train noise is likely to exceed that level. All of these assessments are of noise levels measured outside rather than inside houses.

4.16 The ES describes noise levels both during Phase 1 of the Order Scheme when Chiltern Railways will operate a passenger service of up to 2 trains per hour in each direction, and during Phase 2 which will only occur if and when the East West Rail proposal is built. The noise levels shown below relate to the worst case ie after Phase 2 of the Order Scheme.

4.17 The results of the noise predictions for receptors in North Oxford, reported in the ES, are reproduced below. For residential areas in this mainly urban area, the assessment has been based on the change in noise levels between the existing, or ambient, noise level and those noise levels that will occur after the Order Scheme is built.

4.18 For residential properties the largest noise impact, before mitigation such as noise barriers is provided, is expected to be at night. At receptor 14 (Lakeside), and receptor 16 (St Peters Road) an increase of 12 dB over current ambient noise levels has been predicted as the impact before mitigation. Mitigation has been considered in the ES, and a mitigation scheme based on the use of noise barriers is presented. The final choice of mitigation measures will be determined during detailed design, but it will ensure that noise levels are no higher than the noise levels with noise mitigation in place, as is set out in the ES.

4.19 The predictions suggest that barriers are likely to be required over a total length of over 1.5 km in this area to protect residential properties. The barrier has been designed to be 2 m high relative to the railway tracks. The resulting noise impacts are described in Volume 2, Table 6.2.3, on page 6-57 of the ES, and is summarised below for the receptors in this area:.

RECEPTOR 14 LAKESIDE

4.20 With the proposed barrier in place, a 2 dB residual noise increase is predicted, compared to 12 dB before mitigation at first floor level of the nearest houses in Lakeside where the barrier screening would be least effective. The residual noise change is expected to be less than 2 dB at ground floor level.

4.21 To explain what this means, the smallest change in noise level that is noticeable under normal listening conditions (ie not in a laboratory) is 3 dB. Therefore, the noise change at this property has been classed as a “slight” noise impact in the ES because it is not expected to have a noticeable effect even at first floor level outside these properties. The barrier will be more effective at ground floor level and no noticeable noise increase will occur.

RECEPTOR 16 ST PETERS ROAD

4.22 With a barrier in place, an 8 dB noise increase is predicted at the upper floors of properties closest to the railway (which are likely to be Quadrangle House

and the closest properties on Bladon Close). These changes are likely to be noticeable, but are less than 10 dB which is generally taken to be the point at which a noise source is perceived to be twice as loud. Outside the ground floor, the noise increase is likely to be 2 dB which is not expected to be noticeable. Since these receptors are very close to the tracks, Chiltern Railways is also going to implement other noise mitigation solutions, such as noise insulation to windows, to reduce noise at the upper floor levels during the detailed design.

RECEPTOR 15 WOLVERCOTE PRIMARY SCHOOL

4.23 The daytime/evening noise level, measured outside, is predicted to be 59 dB without mitigation, which is 4 dB higher (ie just noticeably higher) than the 55 dB threshold value, below which significant "community disturbance" is not expected. Noise barriers that are designed to reduce noise to residential properties in the area will also run past the school, and will reduce noise effects to levels that are likely to be below the 55 dB threshold level and noise from the trains will not affect the continued operation of the school.

4.24 Noise barriers and other mitigation will be installed during construction of the Order Scheme, wherever it is needed to mitigate the effects of Phase 1. Additional noise mitigation measures may be needed if Phase 2 of the Order Scheme, for the East West Rail project, is built. The effects predicted above are for Phase 2, and the effects in Phase 1 will be less than these predictions.

4.25 The levels of vibration that will arise from the new train service and track have been carefully assessed. These will be way below the levels which could cause any sort of damage to property. Even if, at present, you can feel or hear vibration or groundborne noise from trains, new track and ballast will be provided which will reduce vibration levels, even though it is accepted that there will be a greater frequency of trains passing.

4.26 Where it is predicted that vibration levels will increase, there are engineering methods, which may have to be used to "damp" vibration from the track. These will be used to ensure that, wherever practicable, everywhere along the railway, vibration felt inside residential properties is kept to below a very strict limit, which is defined in British Standard 6472 as a "low probability of adverse comment". In one or two locations, if full vibration mitigation is not practicable, the vibration levels will, at worst, be limited to "adverse comments possible" according to BS 6472, which is still a strict limit. Even at this level, no structural or cosmetic damage to property will occur.

"Faster trains will increase noise and vibration"

4.27 Although most of the Order Scheme consists of an existing operational railway, the Order Scheme will result in an increase in train speeds along the route resulting in increased noise as trains pass. While higher train speeds will increase the noise from individual trains, the noise mitigation, including over 1.5 km of noise barriers in North Oxford, will offset noise increases which result from increased train speeds.

4.28 Vibration from trains will be kept below a very strict limit. In some places, engineering measures will be needed, but there will be no risk of either cosmetic or structural damage to buildings.

"Freight trains will be longer and carry larger loads which will increase noise and vibration"

4.29 The maximum axleload for freight trains will, in future, be 25.5 tonnes, the same as it is now. This is normally only fully used by trains carrying bulk materials, such as gravel or crushed rock. Most other freight trains are much lighter; the typical axleload on a container train is around 17 to 18 tonnes. This is partly because consumer goods weigh much less and also because containers are transported by both road and rail, and their weight is constrained by the maximum overall weight allowed for lorries.

4.30 The Department for Transport is funding work to enable trains to carry the international standard 9'6" high containers through Wolvercot tunnel without the need for special low-floor wagons (as against 9'0" high containers at present). This does not mean there will be any significant increase in axleloads, since, as noted above this is constrained by the maximum weight of containers that can be carried on lorries.

4.31 The length of freight trains varies according to market needs, e.g. the length of the trains carrying crushed rock is a result of the demand for building materials in the Oxford area, so upgrading the line will not in itself result in increased train lengths. Train lengths could increase for these reasons if the Order Scheme was not implemented. Trains of up to 650 metres length already use the line on occasions.

4.32 In Phase 1, it is very unlikely there will be any change in the number of freight trains on the line, as there will be no new freight terminals. However, if and when the East-West Rail (EWR) project is built, there may be more freight trains. These are most likely to be carrying shipping containers from Southampton. We have therefore included more freight trains in the evaluations for our Environmental Statement, so that this reflects the "worst case".

4.33 Freight trains are much more environmentally sustainable than road haulage as they use far less fuel per tonne of freight moved, and moving freight off the roads greatly reduces road damage and congestion. Modern freight trains on modern track are also very much quieter than those of even a few years ago.

4.34 Trains can be heard above the background noise in my house, such as the television, boiler, fridge, etc., even when the windows are closed. The noise and vibration from passing trains is overwhelming in the garden and in my house if the windows are open. With many more trains, living in adjacent properties to the railway line will become intolerable, our neighbourhood will be destroyed by both the exodus of those people that can afford to move and by a fall in quality of the area. This will inevitably impact on the value of my house making moving to a similarly pleasant location (as now) within Oxford much more difficult.

4.35 Whilst train speed will increase the noise from individual trains, the noise mitigation, including over 1.5 km of noise barriers in North Oxford, is likely to offset increases in speed. However, the number of trains will increase.

4.36 Chiltern Railways is proposing noise mitigation which will apply to noise levels much lower than the statutory limits set out in the Noise insulation Regulations.

4.37 The ES sets out, in a form which will be legally binding on Chiltern Railways, the noise levels above which mitigation will be applied. The preferred option for noise mitigation is one that contains noise at source, such as maintaining the rails and wheels and considering infrastructure solutions to the track bed which reduce noise. Where these are not possible, measures such as noise barriers will be considered. These interrupt the path of the noise between the rails and the windows of the nearest properties. All of these measures will provide benefits in terms of reducing noise both inside and outside the properties.

4.38 Chiltern Railways is proposing noise mitigation in the form of barriers for all locations where there are noise impacts, without mitigation, of at least 5 to 7 dB. In areas such as North Oxford noise changes determine the size of the noise impact. In more rural areas away from major road noise sources, the amount by which the train noise exceeds a daytime threshold of 55 dB or the night-time threshold of 45 dB is the best way of assessing the noise impact. If impacts of more than 10 dB are likely to be experienced at residential properties, Chiltern Railways will consider installing noise insulation. Wherever possible, other forms of mitigation, such as barriers, will be preferred.

4.39 The actual location of properties which will be offered noise insulation will be determined during the detailed design stage and work is ongoing to refine mitigation, but the ES makes clear the standards that are to be achieved in Volume 2, section 6.5.2 on page 6-47.

"As transport by rail increases, the numbers of passengers and freight trains will continue to increase incrementally once the Order Scheme is complete leading to further increases in noise and vibration"

4.40 Different frequencies of service have been assessed under Phases 1 and 2 of the Order Scheme. These frequencies take account of any likely future increase in service frequencies that may occur.

4.41 The frequency of trains using the line will be limited by the capacity of the track layout and signalling system, and the need to offer a robust and reliable service. The assessments of noise and vibration have been based on forecast numbers of all passenger and freight trains in the future, not just those on Chiltern Railways' services. These forecast numbers of services are almost at the maximum capacity of the double track line with the signalling arrangements that are proposed.

"Pollution levels in the immediate vicinity already exceed EU statutory guidelines, and these will be further exacerbated"

4.42 Modelling of the dispersion of emissions from rail and road traffic movements associated with Phase 2 of the Order Scheme (ie with more frequent train movements than in Phase 1) has indicated that pollutant concentrations at residential properties closest to the railway line will not cause significant air quality impacts. The total pollutant concentrations, including those from trains

using the Order Sheme are likely to be within EU statutory guidelines, as implemented in UK law.

4.43 The Order Scheme is generally a positive development for improving air quality, as it provides a sustainable alternative to the car, particularly for commuting journeys into Oxford from surrounding areas.

In addition the standard objection included a section that urges Chiltern Railways and/or Network Rail to:

Ensure that everything possible is done to reduce the impact of the increased train service, such as:

- ***installation of fully-effective noise and vibration barriers next to the track as a matter of urgency concurrent with the work;***

4.44 Chiltern Railways, in association with Network Rail, is doing everything that can reasonably be done to reduce the environmental impacts of the increased services after the Order Scheme is built. This includes the installation of effective noise and vibration mitigation, including noise barriers and insulation, where necessary. Those required to deal with noise from Phase 1 will be installed before any additional train services start running. If Phase 2, for the East West Rail project, is built, additional mitigation measures will be installed, where required.

- ***install track infrastructure designed to reduce noise and vibration including welded track, rail dampers, etc; and***

4.45 Continuously welded track will be installed. A range of additional mitigation measures including rail dampers will be considered to mitigate impacts where these have been identified. The extent and type of mitigation at individual locations will be determined as part of the detailed design which will be developed following the approval of the Order. However, the ES identifies the noise and vibration limits for which mitigation will be provided.

- ***use only well maintained rolling stock fitted with noise and vibration mitigating devices including wheel dampers, etc.***

4.46 Chiltern Railways operates modern trains and undertakes regular inspection and maintenance including regular wheel maintenance at its own facility to correct any wheel flats or other defects that may increase operational noise. Wheel dampers are not normally fitted to trains and would only have a marginal effect under most conditions, and are not proposed for this Order Scheme.

- **use trains that retain sanitary waste for off-track disposal, and**

4.47 All trains built since about 1990 have toilet retention tanks and do not discharge onto the track. Any Chiltern Railways trains in regular service on the Bicester to Oxford line will have retention tanks.

- **review all noise and vibration mitigating measures every six months and repair or upgrade as necessary.**

4.48 Noise will be minimised by ensuring a high standard of maintenance during the operating life of the railway to avoid noise levels increasing unnecessarily due to wear and tear of the wheel and rail surfaces. The track and any noise barriers will be maintained by Network Rail. Furthermore, Chiltern Railways undertakes regular train inspection and wheel maintenance to correct any wheel flats or other defects that may increase operational noise. The frequency of these inspections will be commensurate with the upgraded railway.

"Baseline mitigation on the number of passenger and (longer, heavier) freight trains projected to operate after completion of EastWest Rail and then no subsequent incremental increases in train traffic allowed without full consultation with residents"

4.49 The ES has assessed the likely future numbers and types of train, including the expected increase as a result of the EastWest Rail proposed level of services and has suggested appropriate mitigation measures for this, which will be implemented if Phase 2 of the Order Scheme, which is needed for East West Rail, goes ahead. The forecast numbers and types of trains used for the assessment of Phase 2 are almost at the maximum that could use the railway with the double track and signalling arrangements which are proposed. Mitigation is designed in the first instance for Phase 1, with a requirement that the Phase 2 mitigation is done before the Phase 2 works are brought into use.

"Provide funding to equip my house with the highest quality glazing and to undertake any repairs to my house caused by vibration"

4.50 It is very unlikely that vibrations from the operation of the trains will cause any form of structural damage. In the unlikely event that it does, owners will be able to claim for compensation under the Compulsory Purchase Compensation Code. More detail on this can be found in the booklet on compensation produced by The Office of the Deputy Prime Minister, which can be found on line at:
http://www.communities.gov.uk/publications/planningandbuilding/compulsorypurchase4

4.51 Noise insulation, usually secondary or double glazing, will be provided at a small number of properties that qualify under the Noise Insulation Regulations. The properties at which this is likely to be the case are outlined in the ES in Volume 2, Table 6.14, Page 6-38. There are a few other properties, which do not qualify under the Regulations, where Chiltern Railways believes that noise insulation should be offered. These are discussed in Volume 2 of the ES at page 6-54 and 6-59.

"Maintain and enforce the present speed restriction (40mph) on all trains along the sections of the track adjoining residential areas"

4.52 The predicted increased noise levels resulting from all causes will be mitigated as set out in the ES. Speed restrictions will apply to various sections of the line for safety reasons, but restricting speeds to 40 mph, for example, from Oxford station to the edge of the built up area, would not be practicable. Timetable predictions show that reducing speed from those proposed for the Order Scheme would make reliable operation impractical and would not meet the aims of the project, which are to provide reliable and fast rail services

between Oxford, Bicester and London. At lower speeds it would be impossible to operate a viable timetable that avoids congestion on the single track section of the route from Oxford station to Oxford North Junction and fits with the required timetable train paths onwards to Bicester and London.

"No trains during the night from 00:00 until 05:00"

4.53 Chiltern Railways will not be running passenger trains through the night, and services in late evening and early morning will be at a reduced frequency. A very small number of trains (perhaps 1 or 2) may arrive in Oxford after midnight or depart from Oxford before 0600.

4.54 Any overall increase in freight train numbers above those currently operated is only likely if and when the East-West Rail project goes ahead. The number of freight movements will reflect national freight demand, and will be limited by the number of available freight paths (1 per hour in each direction) and the likely market demand. Based on analysis of the number of the existing situation on the main line through Oxford, only about half of the available freight paths are likely to be used limiting the number to perhaps five freight train movements between midnight and 0500 hours, and perhaps 8 train movements between 2300 to 0700 hours.

Electrify the line as soon as practically possible

4.55 Electrification is an issue for consideration by Network Rail and the Department for Transport as it must be considered on a network wide basis. There are no proposals at present to electrify the line. However, all new and rebuilt structures on the line (bridges, tunnels, etc) will be constructed with sufficient clearances to enable electrification in future.