

TECHNICAL NOTE

on behalf of

BARTON WILMORE

for the site at

LAND SOUTH OF HOLT ROAD, WREXHAM

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NOTE**

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Summary

Following a request from the local planning authority, this technical note discusses the change in road traffic noise levels along existing roads close to the entrance of the proposed residential development at Land south of Holt Road, Wrexham.

Traffic associated with the Holt Road site (KSS2) and another key area for development (KSS3) have been modelled cumulatively for A534 Holt Road to the east and west of the site and also the A5156 to the north of the site access.

Using modelled traffic flow numbers, traffic speed and % of heavy vehicles a comparison of basic noise level has been calculated for each road link following CRTN methodology.

This technical note serves to determine the impact and potential for significant effect due to cumulative changes in road traffic noise from the developments identified in the Local Plan.

The impact of road traffic noise increase in the area, due to the proposed developments is considered to be negligible and therefore the effect is not significant.

Record of changes

Prepared By Matt Wilson MIOA

Reviewed By Michael Rickard MIOA

Signed



Signed



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1 Introduction

1.1 Following a request from the local planning authority, this technical note discusses the change in road traffic noise levels along existing roads close to the entrance of the proposed residential development at Land south of Holt Road, Wrexham.

1.2 The Local Authority have identified the following sites as strategic development areas in the Wrexham Local Development Plan 2013 - 2028. Each phase of development in the area will generate new traffic which will use the existing road infrastructure.

1.3 Policy SP5: KSS2: Land east of Cefn Road, Wrexham, which includes the Holt Road site, states the following:

Land is allocated east of Cefn Road, Wrexham as shown on the proposals map to deliver a residential led mixed use scheme with a minimum of 1680 new homes, 1580 of which will be delivered within the plan period. Development will include an element of affordable housing and associated community uses, along with necessary infrastructure which will be delivered in a phased manner...

1.4 Policy SP11: KSS3: Land to the north of Bryn Lane, Wrexham Industrial Estate, states the following:

Land is allocated to the north of Bryn Lane, Wrexham Industrial Estate as shown on the proposals map to deliver 28ha of employment land for B use class purposes including an ecological network and residential buffer zone along with enabling and necessary infrastructure which will be delivered in a phased manner...

1.5 The traffic flows for 2023, partial completion and 2028, the end of the plan period, have been predicted using data from VISSIM and TEMPRO traffic modelling for the following links on the existing road network:

1. A534 Holt Road – East of Site Access,
2. A5156 – North of Site Access; and
3. Holt Road – West of Site Access.

2 Acoustic Guidance

2.1 The following assessment criteria and prediction methodology have been utilised in this technical note.

Calculation of Road Traffic Noise

2.2 The Calculation of Road Traffic Noise (CRTN) uses Average Annual Weekday Traffic flows over the period 0600 – 2400 (AAWT_18h) on a normal working day to calculate road traffic noise. Charts 3 and 4 allow a prediction of the basic noise level ($L_{A10,18h}$) of a road, with appropriate corrections for traffic speed and percentage of heavy vehicles.

2.3 Equation 1 and Equation 2 below show the calculation methodology:

$$\text{Eq1} \quad L_{A10,18h} = 29.1 + 10 \times \log_{10}(Q) + \text{Correction}$$

$$\text{Eq2} \quad \text{Correction} = 33 \log_{10}(V + 40 + (500/V)) + 10 \log_{10}(1 + (5p/V)) - 68.8$$

Where:

Q AAWT_18h Vehicle Flow
V Mean Velocity
p Percentage of Heavy Vehicles

Design Manual for Roads and Bridges

2.4 The Design Manual for Roads and Bridges (DMRB) provides a framework for defining the magnitude of change in noise levels due to changes in road traffic flows and for determining the significance of effect of those changes. Document LA111 which replaces the previous document HD 213/11, requires comparison of the following traffic scenarios:

- Short term: Do Minimum Opening Year (DMOY) compared against the Do Something Opening Year (DSOY);
- Long-term: DMOY compared against the Do Something Future Year (DSFY); and
- Non-project noise change: Do-Minimum Future Year (DMFY) compared against the DMOY.

2.5 The following tables describe the magnitude of change in noise levels and resultant significance due to changes in road traffic.

Table 2.1: Magnitude of Change

Short Term Magnitude	Short term noise change (dB $L_{A10,18h}$)
Major	Greater than or equal to 5.0
Moderate	3.0 – 4.9
Minor	1.0 – 2.9
Negligible	Less than 1.0
Long Term Magnitude	Long term noise change (dB $L_{A10,18}$)
Major	Greater than or equal to 10.0
Moderate	5.0 – 9.9
Minor	3.0 – 4.9
Negligible	Less than 3.0

Table 2.2: Initial assessment of operational noise significance

Significance	Short Term Magnitude of Change
Significant	Major
Significant	Moderate
Not Significant	Minor
Not Significant	Negligible

- 2.6 Typically, a long-term change will be assessed 15 years after the year of opening of any development. As the future year in this case is 2028, all assessments will be done using the impact criteria for a short-term change in noise levels.
- 2.7 Where the magnitude of change in the short term is negligible at noise sensitive buildings, it shall be concluded that the noise change will not cause changes to behaviour or response to noise and as such, will not give rise to a likely significant effect

3 Predicted Traffic Flow

3.1 Table 3.1 below shows the predicted traffic flows for 2023 and 2028 along the three identified existing roads.

Table 3.1: AAWT_18h Traffic Flows

Road Link	2023		2028		HGV %
	Do Nothing	Do Something	Do Nothing	Do Something	
1	27017	30261	27092	33436	7%
2	27286	29765	27652	33111	8%
3	13658	15152	13721	12238	3%
NOTES 2023 Do Nothing - Existing road network; background traffic growth only from Unadjusted TEMPRO 2023 Do Something - Junction improvements at A5156 and Ind Estate Roundabout; Development Traffic from 50% KSS3, 250 units on KSS2 (north) and 460 on KSS2 (South); Adjusted TEMPRO 2028 Do Nothing - Existing road network; background traffic growth only from Unadjusted TEMPRO 2028 Do Something - Link Road from A5156 Roundabout to Cefn Road; Junction improvements at A5156 and Ind Estate Roundabout; Development Traffic from 100% KSS3, 100% (600 Units) on KSS2 (north) and 100% (1080 units) on KSS2 (South); Adjusted TEMPRO					

4 Predicted Noise Levels

4.1 Table 4.1 below shows the predicted basic noise levels from each road. The levels presented are not predictions at any receptor but at 10.0 m from the carriageway. To assess the worst case, LA111 requires that with development levels for each road are assessed against the baseline, without development for the initial year, therefore in this situation, all levels are assessed against 2023 Baseline.

4.2 The comparison between the predicted noise levels is presented in Table 4.2.

Table 4.1: Predicted noise levels

Link Ref.	2023 Baseline				2023 Baseline + Development			
	Speed kph	Flow 18hr	%HGV	Basic noise level at 10m	Speed kph	Flow 18hr	%HGV	Basic noise level at 10m
1	113	27017	7	78.3	113	30261	7	78.8
2	113	27286	8	78.5	113	29765	8	78.9
3	48	13658	3	67.6	48	15152	3	68.1
Link Ref.	2023 Baseline				2028 Baseline + Development			
	Speed kph	Flow 18hr	%HGV	Basic noise level at 10m	Speed kph	Flow 18hr	%HGV	Basic noise level at 10m
1	113	27017	7	78.3	113	33436	7	79.2
2	113	27286	8	78.5	113	33111	8	79.3
3	48	13658	3	67.6	48	12238	3	67.1

Table 4.2: Noise Level Difference

Link Ref.	Difference 2023 dB L_{A1018h}	Impact	Adverse or Beneficial	Effect
1	0.5	Negligible	Adverse	Not Significant
2	0.4	Negligible	Adverse	Not Significant
3	0.5	Negligible	Adverse	Not Significant
Link Ref.	Difference 2028 dB L_{A1018h}	Impact	Adverse or Beneficial	Effect
1	0.9	Negligible	Adverse	Not Significant
2	0.8	Negligible	Adverse	Not Significant
3	-0.5	Negligible	Beneficial	Not Significant

4.3 It can be seen in the results above in Table 4.2 that the magnitude of change in all instances is **Negligible** and therefore the effect of change in road traffic noise is **Not Significant**.

5 Conclusions

- 5.1 An assessment of road traffic noise changes due to the cumulative effects of development at KSS2 and KSS3 from the Wrexham Local Development Plan 2013 – 2028 has been undertaken as part of a planning application for part of the KSS2 site at Land South of Holt Road.
- 5.2 The road traffic noise levels have been calculated using methodology from CRTN and assessed for magnitude of impact and significance of effect, with reference to DMRB document LA111.
- 5.3 Road traffic flow rates for the years 2023 and 2028 have been predicted using traffic modelling by the wider project team and as part of the development of the Wrexham Local Development Plan.
- 5.4 The assessment shows that the impact of changes in traffic noise levels will be Negligible and therefore the effect will not be significant.

Glossary of Terms

- Decibel (dB)** The unit used to quantify sound pressure levels; it is derived from the logarithm of the ratio between the value of a quantity and a reference value. It is used to describe the level of many different quantities. For sound pressure level the reference quantity is 20 μPa , the threshold of normal hearing is in the region of 0 dB, and 140 dB is the threshold of pain. A change of 1 dB is usually only perceptible under controlled conditions.
- dB L_A** Decibels measured on a sound level meter incorporating a frequency weighting (A weighting) which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB L_A broadly agree with an individual's assessment of loudness. A change of 3 dB L_A is the minimum perceptible under normal conditions, and a change of 10 dB L_A corresponds roughly to halving or doubling the loudness of a sound. The background noise level in a living room may be about 30 dB L_A ; normal conversation about 60 dB L_A at 1 meter; heavy road traffic about 80 dB L_A at 10 meters; the level near a pneumatic drill about 100 dB L_A .
- $L_{A90,T}$** The A weighted noise level exceeded for 90% of the specified measurement period (T). In BS 4142: 1997 it is used to define background noise level.
- $L_{Aeq,T}$** The equivalent continuous sound level. The sound level of a notionally steady sound having the same energy as a fluctuating sound over a specified measurement period (T). $L_{Aeq,T}$ is used to describe many types of noise and can be measured directly with an integrating sound level meter.
- $L_{A10(18 \text{ hour})}$** Often referred to as the UK road traffic noise index, this is the arithmetic average of the values of L_{A10} hourly for each of the 18 one hour periods between 06:00 and 00:00.
- NOEL** No observed effect level: the level of noise exposure below which no effect at all on health or quality of life can be detected.
- LOAEL** Lowest observed adverse effect level: the level of noise exposure above which adverse effects on health or quality of life can be detected.
- SOAEL** Significant observed adverse effect level: the level of noise exposure above which significant adverse effects on health or quality of life can be detected.

