

ENVIRONMENTAL SERVICES

FINAL REPORT

Client

Title

NATIONAL ROADS AUTHORITY
St. Martin's House
Waterloo Road
Dublin 4.

Nenagh ByPass
Noise Aspects

Attention: Head of Corporate Affairs

Report Ref: 121716

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1.0 INTRODUCTION

- 1.1 This report was undertaken at the request of Mr. Michael Egan, Head of Corporate Affairs, National Roads Authority. The object of this report is to present the results of noise surveys carried out in Nenagh before and after the opening of the N7 By-Pass.
- 1.2 Sound levels are measured with a meter in units called decibels (dB), and noise has often been defined as unwanted sound. Environmental noise levels are usually assessed in terms of A-weighted decibels, the dB(A). The A-weighting approximates to the response of the human ear.
- 1.3 Road traffic noise may cause annoyance and the most commonly used parameter in Ireland and the UK used for the assessment of traffic noise is the L_{10} dB(A) level, i.e. the noise level exceeded for 10% of the relevant time. The criterion used in the UK and by local authorities in Ireland is the L_{10} (18-hour) dB(A). This is the mean of the hourly L_{10} levels in the period 06.00 to 24.00 hours. Social surveys in the UK have shown that there is a good correlation of dissatisfaction towards traffic noise with the L_{10} levels. UK legislation has a limit of 68 dB(A) L_{10} (18-hour) for new road schemes before noise abatement at the point of reception is required. This level is exceeded near most National Primary Routes and in towns on these roads. A doubling or halving in road traffic equates to a change in noise levels of 3 dB(A).
- 1.4 Road traffic may also be assessed using the L_{Aeq} parameter and traffic noise with an L_{10} (18-hour) of 68 dB(A) is approximately equal to an L_{Aeq} of 65 dB. Industrial noise (and occupational noise) is also expressed in L_{Aeq} terms. The criterion for industrial noise outside residential premises during day-time is usually an L_{Aeq} of 50 or 55 dB. Level for level, traffic noise is less objectionable (and railway noise less again) than industrial noise.

2.0 SUMMARY

2.1 Noise measurements made on the N7 route through Nenagh indicate a significant reduction in levels after the opening of the Bypass. The most significant reduction appears to be due to the early morning heavy commercial vehicles on the Dublin Limerick route.

3.0 NOISE MEASUREMENTS

3.1 Noise measurements were made at five locations in the town as shown in Figure 1, in June and October 2000 before and after the Bypass opening. Measurements were made at locations designated 1, 2 and 3 using the shortened measurement method of the HMSO publication "Calculation of Road Traffic Noise", 1988. Measurements had also been made at these three locations in 1987 for the route selection process and the results are included below. Measurements were made over longer periods from Thursday to Monday at locations designated A and B. The instrumentation consisted of Larson-Davis and CEL Environmental Noise Analysers with associated microphones and calibrator and the measurement location was c 1 metre from the first floor facade of the building.

3.2 The locations are:

1. Thomas MacDonagh Street (old N7) near junction with:
2. Pearse Street (old N7)
3. Mitchel Street
- A Thomas MacDonagh Street (old N7)
- B. Ashe Road (old N7)

3.3 The noise level was sampled continuously and the following data were obtained for each hourly measurement period:

L_{A01} - the noise level equalled or exceeded for 1 % of the measurement period, the maximum levels.

L_{A10} - the noise level equalled or exceeded for 10 % of the measurement period, the road traffic noise parameter.

L_{A95} - the noise level equalled or exceeded for 95 % of the measurement period. This level is taken to represent the background noise level.

L_{Aeq} - the equivalent continuous noise level for the measurement period.

The L₁₀ (18-hour) value can be calculated from the relationship:

$$L_{10} (18-h) = L_{10} (3-hour) - 1 \text{ dB(A)}.$$

3.3 The measured 3-hour levels are shown in the table 1 and the results are:

Location	L ₁₀ (18-h) dB(A)			
	1987	2000	2000	Difference
	Pre Bypass		Bypass	
1 MacDonagh St. (N7)	77	79	77	2
2 Pearse St. (N7)	74	76	72	4
3 Mitchel St.	72	70	71	-1

3.4 The measured hourly parameters for June and October 2000 at locations A and B are shown in tables 2 and 3 respectively. The difference in L₁₀ (1-h) values are shown in Table 4 and plotted in figure 2.

3.5 The measured L₁₀ (18-h) for Friday, Saturday and Sunday, and the L₁₀ (12-h) for Monday together with the differences between June and October at locations A and B are:

Location	L ₁₀ (18-h) dB(A)			
	Friday	Saturday	Sunday	Monday(12h)
Pre A1 MacDonaghSt.	74	73	73	75
A2 Bypass in place	72	71	69	72
Difference	2	2	4	3
Pre B1 Ashe Road	77	76	73	78
B2 Bypass in place	73	71	69	72
Difference	4	5	4	6

4.0 ASSESSMENT

- 4.1 A comparison between the pre and post Bypass measurement results at locations 1 and 2 shows a reduction of 2 and 4 dB(A) respectively. There was an increase of 1 dB(A) at location 3 which is not on the main N7 route and probably carries mostly town traffic. The 2000 measured levels at this location are less than the 1987 levels.
- 4.2 A comparison between the pre and post Bypass measurements at locations A and B shows L_{10} (18-h) reductions between 2 and 4 dB(A) and L_{10} (16-h) (Monday measurement) reductions of 3 and 6 dB(A).
- 4.3 The reductions at Location B were at all times greater than those at Location A. It may be that most of the through N7 traffic passed along Ashe Road (B) but the traffic passing along MacDonagh Street (A) also contained N52 traffic.
- 4.4 The greatest differences in the pre and post Bypass measurements are shown in Table 4. These are the L_{10} (1h) levels between the hours 04:00 and 07:00 on weekdays. This may be due to heavy commercial vehicles on early morning distribution runs on the Dublin to Limerick route.