Directive 2002/49/EC

Informing the development of a new noise action plan for Wales:

Estimated population exposure to environmental noise

February 2018

Informing the development of a new noise action plan for Wales

ESTIMATED POPULATION EXPOSURE TO ENVIRONMENTAL NOISE

In 2012 Extrium Ltd, under contract from the Welsh Government, produced noise maps for major roads across Wales, for major railways across Wales, and for all roads, all railways and major industry in Wales' three largest urban agglomerations[1]. A residential population model was also constructed in 2012 to estimate the numbers of people whose homes were exposed to noise above certain levels.

The population exposure statistics derived from the 2012 noise maps and the 2012 population model were published in the 2013 noise action plan for Wales[2].

New noise maps were produced in 2017 for major roads across Wales, and for major industry in Wales' three largest urban agglomerations[3]. An updated residential population model was also constructed in 2017.

The 2017 population model has been used in conjunction with the 2012 noise maps to estimate the increase in population exposure to environmental noise in Wales resulting from an increasing residential population, i.e. holding noise levels constant.

The 2017 population model has also been used in conjunction with the 2017 noise maps (calculated for major roads and agglomeration industry only) to estimate the overall change in population exposure resulting from both an increasing residential population and a changing soundscape (e.g. following changes to road layouts, traffic flows and industrial activity).

The data sources and methods applied to generate the noise maps and population exposure statistics are described in technical documents available to download from the Welsh Government's website[4]. The definitions of the noise sources mapped are contained in the noise action plan and may be viewed alongside the noise maps.

It should be noted that changes made to the calculation environment between 2012 and 2017 have resulted in higher noise levels being calculated at receivers that are located less than 7.5 metres from a road traffic noise source. This unfortunately means that very close to the road the 2012 and 2017 noise maps are not directly comparable, and so part of the increase in the overall population exposure statistics from 2012 to 2017 (where 2017 noise levels are used) may be attributable to these software differences rather than to real world changes in noise exposure. This is particularly relevant for the higher noise bands, e.g. L_{den} 70-74 dB or > 75 dB.

In the tables, "all mapped roads" and "all mapped railways" mean major roads and railways outside the urban agglomerations plus all roads and railways within the agglomerations. The agglomeration boundaries are shown in the noise action plan.

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[1] http://lle.gov.wales/catalogue/item/EnvironmentalNoiseMapping
[2] http://gov.wales/topics/environmentcountryside/epq/noiseandnuisance/environmentalnoise/noisemonitoringmapping/noise-action-plan
[3] http://lle.gov.wales/catalogue/item/EnvironmentalNoiseMapping2017
[4] http://gov.wales/topics/environmentcountryside/epq/noiseandnuisance/environmentalnoise/noisemonitoringmapping/second-round-results and http://gov.wales/topics/environmentcountryside/epq/noiseandnuisance/environmentalnoise/noisemonitoringmapping/third-round-noise-mapping

Table 1 Population exposure to noise from major roads in Wales using the day-evening-night noise indicator L_{den}

Method of calculation	Number of people exposed to these noise levels				
	55-59 dB	60-64 dB	65-69 dB	70-74 dB	> 75 dB
2012 noise levels and population model	232,500	113,900	76,300	44,600	4,000
2012 noise levels, 2017 population model	239,900	116,900	78,500	48,200	4,400
2017 noise levels and population model	254,100	112,500	74,500	54,800	6,600

Table 2 Population exposure to noise from all mapped roads in Wales using the day-evening-night noise indicator L_{den}

Method of calculation	Number of people exposed to these noise levels				
	55-59 dB	60-64 dB	65-69 dB	70-74 dB	> 75 dB
2012 noise levels and population model	275,400	164,200	129,000	50,300	4,000
2012 noise levels, 2017 population model	282,000	168,800	132,500	54,500	4,400

Table 3 Population exposure to noise from major roads in Wales using the night-time noise indicator L_{night}

Method of calculation	Number of people exposed to these noise levels				
	50-54 dB	55-59 dB	60-64 dB	65-69 dB	> 70 dB
2012 noise levels and population model	160,600	86,900	54,800	5,100	1,400
2012 noise levels, 2017 population model	166,100	88,900	58,800	5,700	1,500
2017 noise levels and population model	159,700	90,000	62,000	8,200	1,600

Table 4 Population exposure to noise from all mapped roads in Wales using the night-time noise indicator L_{night}

Method of calculation	Number of people exposed to these noise levels				
	50-54 dB	55-59 dB	60-64 dB	65-69 dB	> 70 dB
2012 noise levels and population model	204,600	147,700	63,100	5,200	1,400
2012 noise levels, 2017 population model	211,300	151,100	67,700	5,700	1,500

Table 5 Population exposure to noise from major railways in Wales using the day-evening-night noise indicator L_{den}

Method of calculation	Number of people exposed to these noise levels				
	55-59 dB	60-64 dB	65-69 dB	70-74 dB	> 75 dB
2012 noise levels and population model	23,000	14,600	10,200	5,700	2,100
2012 noise levels, 2017 population model	23,700	15,600	11,900	5,800	3,500

Table 6 Population exposure to noise from all mapped railways in Wales using the day-evening-night noise indicator L_{den}

Method of calculation	Number of people exposed to these noise levels				
	55-59 dB	60-64 dB	65-69 dB	70-74 dB	> 75 dB
2012 noise levels and population model	25,900	15,800	10,400	5,700	2,100
2012 noise levels, 2017 population model	26,700	16,900	12,200	5,800	3,500

Table 7 Population exposure to noise from major railways in Wales using the night-time noise indicator L_{night}

Method of calculation	Number of people exposed to these noise levels				
	50-54 dB	55-59 dB	60-64 dB	65-69 dB	> 70 dB
2012 noise levels and population model	20,300	11,800	6,700	4,600	400
2012 noise levels, 2017 population model	20,500	13,200	7,400	5,200	1,200

Table 8 Population exposure to noise from all mapped railways in Wales using the night-time noise indicator L_{night}

Method of calculation	Number of people exposed to these noise levels				
	50-54 dB	55-59 dB	60-64 dB	65-69 dB	> 70 dB
2012 noise levels and population model	22,000	12,300	6,800	4,600	400
2012 noise levels, 2017 population model	22,300	13,700	7,500	5,200	1,200

CARDIFF AND PENARTH AGGLOMERATION

Table 9a **Population exposure using the day-evening-night noise indicator L_{den} – 2012 noise levels and population model** (total population 359,400)

Noise source	Number of people exposed to these noise levels				
	55-59 dB	60-64 dB	65-69 dB	70-74 dB	> 75 dB
Major roads	27,800	11,500	9,200	12,200	600
All roads	47,100	36,400	35,600	14,400	600
Major railways	7,200	5,100	5,100	2,400	1,300
All railways	8,000	5,100	5,100	2,400	1,300
Industry	1,700	500	0	0	0

Table 9b **Population exposure using the day-evening-night noise indicator L_{den} – 2012 noise levels, 2017 population model** (total population 369,700)

Noise source	Number of people exposed to these noise levels				
	55-59 dB	60-64 dB	65-69 dB	70-74 dB	> 75 dB
Major roads	28,800	11,600	9,800	13,900	700
All roads	47,600	37,700	36,400	16,300	700
Major railways	8,000	5,700	6,600	2,400	2,700
All railways	8,800	5,700	6,700	2,400	2,700
Industry	2,100	300	0	0	0

Table 9c **Population exposure using the day-evening-night noise indicator L_{den} – 2017 noise levels and population model** (total population 369,700)

Noise source	Number of people exposed to these noise levels				
	55-59 dB	60-64 dB	65-69 dB	70-74 dB	> 75 dB
Major roads	35,700	12,900	10,900	13,000	1,500
Industry	2,400	300	0	0	0

CARDIFF AND PENARTH AGGLOMERATION continued

Table 10a Population exposure using the night-time noise indicator L_{night} – 2012 noise levels and population model (total population 359,400)

Noise source	Number of people exposed to these noise levels				
	50-54 dB	55-59 dB	60-64 dB	65-69 dB	> 70 dB
Major roads	16,200	9,700	13,400	800	100
All roads	38,800	40,600	16,300	800	100
Major railways	6,200	5,300	2,500	2,200	200
All railways	6,200	5,300	2,500	2,200	200
Industry	1,200	300	0	0	0

Table 10b Population exposure using the night-time noise indicator L_{night} – 2012 noise levels, 2017 population model (total population 369,700)

Noise source	Number of people exposed to these noise levels				
	50-54 dB	55-59 dB	60-64 dB	65-69 dB	> 70 dB
Major roads	16,400	10,100	15,200	900	100
All roads	39,800	41,500	18,300	900	100
Major railways	6,700	6,500	3,100	2,700	900
All railways	6,800	6,500	3,100	2,700	900
Industry	1,400	200	0	0	0

Table 10c Population exposure using the night-time noise indicator L_{night} – 2017 noise levels and population model (total population 369,700)

Noise source	Number of people exposed to these noise levels				
	50-54 dB	55-59 dB	60-64 dB	65-69 dB	> 70 dB
Major roads	18,800	12,000	13,900	1,800	200
Industry	1,600	200	0	0	0

NEWPORT AGGLOMERATION

Table 11a Population exposure using the day-evening-night noise indicator L_{den} – 2012 noise levels and population model (total population 148,500)

Noise source	Number of people exposed to these noise levels				
	55-59 dB	60-64 dB	65-69 dB	70-74 dB	> 75 dB
Major roads	28,600	13,800	5,700	2,500	1,000
All roads	39,100	20,600	13,600	3,600	1,100
Major railways	3,100	1,600	800	1,000	400
All railways	4,700	2,300	1,000	1,000	400
Industry	900	300	100	0	0

Table 11b Population exposure using the day-evening-night noise indicator L_{den} – 2012 noise levels, 2017 population model (total population 150,100)

Noise source	Number of people exposed to these noise levels				
	55-59 dB	60-64 dB	65-69 dB	70-74 dB	> 75 dB
Major roads	29,700	14,000	5,200	2,600	1,100
All roads	40,000	21,000	13,600	3,900	1,100
Major railways	3,200	1,800	800	1,000	500
All railways	4,900	2,500	1,000	1,100	500
Industry	1,100	400	100	0	0

Table 11c Population exposure using the day-evening-night noise indicator L_{den} – 2017 noise levels and population model (total population 150,100)

Noise source	Number of people exposed to these noise levels				
	55-59 dB	60-64 dB	65-69 dB	70-74 dB	> 75 dB
Major roads	32,100	13,900	5,100	2,700	1,100
Industry	800	200	100	0	0

NEWPORT AGGLOMERATION continued

Table 12a Population exposure using the night-time noise indicator L_{night} – 2012 noise levels and population model (total population 148,500)

Noise source	Number of people exposed to these noise levels				
	50-54 dB	55-59 dB	60-64 dB	65-69 dB	> 70 dB
Major roads	22,300	8,600	3,400	1,200	500
All roads	28,600	17,200	5,300	1,200	500
Major railways	2,800	1,100	900	1,000	100
All railways	3,900	1,300	1,000	1,000	100
Industry	700	200	100	0	0

Table 12b Population exposure using the night-time noise indicator L_{night} – 2012 noise levels, 2017 population model (total population 150,100)

Noise source	Number of people exposed to these noise levels				
	50-54 dB	55-59 dB	60-64 dB	65-69 dB	> 70 dB
Major roads	22,700	8,200	3,600	1,200	600
All roads	29,200	17,100	5,800	1,200	600
Major railways	2,900	1,300	800	1,100	200
All railways	4,000	1,500	1,000	1,100	200
Industry	800	200	100	0	0

Table 12c Population exposure using the night-time noise indicator L_{night} – 2017 noise levels and population model (total population 150,100)

Noise source	Number of people exposed to these noise levels				
	50-54 dB	55-59 dB	60-64 dB	65-69 dB	> 70 dB
Major roads	22,700	8,600	3,400	1,300	600
Industry	500	200	0	0	0

SWANSEA AND NEATH PORT TALBOT AGGLOMERATION

Table 13a Population exposure using the day-evening-night noise indicator L_{den} – 2012 noise levels and population model (total population 285,400)

Noise source	Number of people exposed to these noise levels				
	55-59 dB	60-64 dB	65-69 dB	70-74 dB	> 75 dB
Major roads	39,000	21,600	10,700	7,100	1,000
All roads	52,100	40,100	29,100	9,600	1,100
Major railways	3,400	2,400	1,500	400	0
All railways	4,000	3,000	1,500	400	0
Industry	4,100	500	100	0	0

Table 13b Population exposure using the day-evening-night noise indicator L_{den} – 2012 noise levels, 2017 population model (total population 288,400)

Noise source	Number of people exposed to these noise levels				
	55-59 dB	60-64 dB	65-69 dB	70-74 dB	> 75 dB
Major roads	39,800	21,700	11,400	7,400	1,000
All roads	52,900	40,300	30,300	9,900	1,100
Major railways	3,500	2,600	1,600	400	0
All railways	4,100	3,100	1,700	400	0
Industry	4,300	500	100	0	0

Table 13c Population exposure using the day-evening-night noise indicator L_{den} – 2017 noise levels and population model (total population 288,400)

Noise source	Number of people exposed to these noise levels				
	55-59 dB	60-64 dB	65-69 dB	70-74 dB	> 75 dB
Major roads	39,500	18,100	10,700	7,400	1,000
Industry	3,800	400	100	0	0

SWANSEA AND NEATH PORT TALBOT AGGLOMERATION continued

Table 14a Population exposure using the night-time noise indicator L_{night} – 2012 noise levels and population model (total population 285,400)

Noise source	Number of people exposed to these noise levels				
	50-54 dB	55-59 dB	60-64 dB	65-69 dB	> 70 dB
Major roads	31,900	14,200	9,400	1,500	500
All roads	47,000	35,600	12,900	1,500	500
Major railways	3,000	2,000	1,100	100	0
All railways	3,600	2,300	1,100	100	0
Industry	2,400	300	100	0	0

Table 14b Population exposure using the night-time noise indicator L_{night} – 2012 noise levels, 2017 population model (total population 288,400)

Noise source	Number of people exposed to these noise levels				
	50-54 dB	55-59 dB	60-64 dB	65-69 dB	> 70 dB
Major roads	32,000	14,800	9,900	1,600	500
All roads	47,200	36,700	13,500	1,600	500
Major railways	3,200	2,100	1,100	100	0
All railways	3,700	2,400	1,100	100	0
Industry	2,400	300	100	0	0

Table 14c Population exposure using the night-time noise indicator L_{night} – 2017 noise levels and population model (total population 288,400)

Noise source	Number of people exposed to these noise levels				
	50-54 dB	55-59 dB	60-64 dB	65-69 dB	> 70 dB
Major roads	28,700	14,400	9,100	1,400	400
Industry	2,100	300	0	0	0