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Regulatory Impact Assessment of New Vehicle Noise Test

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Introduction

- **TRL Project for UK Department for Transport (DfT), to research the effects of the proposed new vehicle noise test**

- **DfT assumed the new test in force in 2007, with limits equivalent to those of the present test, with a 2dB reduction in 2010**

Introduction

- **Benefits and costs in are assessed to find rough value of the ratio of**

  benefit : cost

  e.g. 2:1 or 50:1?

- **December 2004 - March 2005, TRL assessed costs and benefits in the UK of the proposed new test**

1.Overview

- 1. Overview
- 2. The Big Picture
- 3. Birmingham study + Assumption 1
- 4. Noise exposure of housing
- 5. Value of benefits + Assumption 2
- 6. Achievable reductions?
- 7. Real roads and test surfaces + Assumption 3
- 8. Costs to industry + Assumption 4
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2. The big picture

UK road traffic in 2004

Source: DfT Road Traffic Statistics Bulletin July 2005

Vehicle Type	Billion vehicle km in 2004	% of all motor vehicle traffic
Cars + Taxis	398	80%
Light vans (N1)	61	12%
Goods vehicles (N2 and N3)	29	6%
Buses + coaches	5	1%

3. The Birmingham study + Assumption 1

The DfT 'Birmingham noise study':

- **'Hedonic Pricing' study of six districts in Birmingham, UK's second city**

- **Gives estimates of value to residents of 1dB(A) reductions in road noise, per year, per household**

3. The Birmingham study + Assumption 1

Results of Birmingham study:

Interval within which noise change occurs. dB(A)	Value per 1dB(A) reduction per household per year. Euros, 2002 prices
55-60	75
60-65	99
65-70	123
70-75	148
75-80	172

3. The Birmingham study + Assumption 1

Are these numbers reasonable? Other studies, from Prof Abigail Bristow, April 2005:

Author and place	Value per 1dB(A) reduction per household per year. Euros, 2001 prices
Pommerehne, 1988, Basel	99
Saelinsminde, 1999, Oslo and Akerhus	48-96
Wardman & Bristow, 2004, Edinburgh	37-55
Arsenio et al, forthcoming, Lisbon	55
Bjorner, 2004, Copenhagen	2 (55dB(A)) to 10 (75dB(A))

3. The Birmingham study + Assumption 1

Assumption 1:

We can use the valuations of the Birmingham study as a proxy for all road noise valuations.

Birmingham study has not captured the valuations from households with noise below 55db(A). However, these people are pedestrians, workers, e.g. in shops that front onto roads.

4. Noise exposure of housing

- **Department for Environment, Food and Rural Affairs study in 2001**
- **54 +/-3 % of UK population live in dwellings exposed to more than 55dB LAeq, day**
- **9% exposed to more than 65dB LAeq, day**

5. Value of benefits + Assumption 2

Basic equation for the minimum value of benefit to all population:

(Total number of houses exposed to 55-64 dB x value of a 1 dB reduction from 55dB)

+

(Total number of houses exposed to 65 dB or more x value of 1 dB reduction from 65dB)

5. Value of benefits + Assumption 2

Assumption 2:

‘Benefit transfer’ is acceptable.

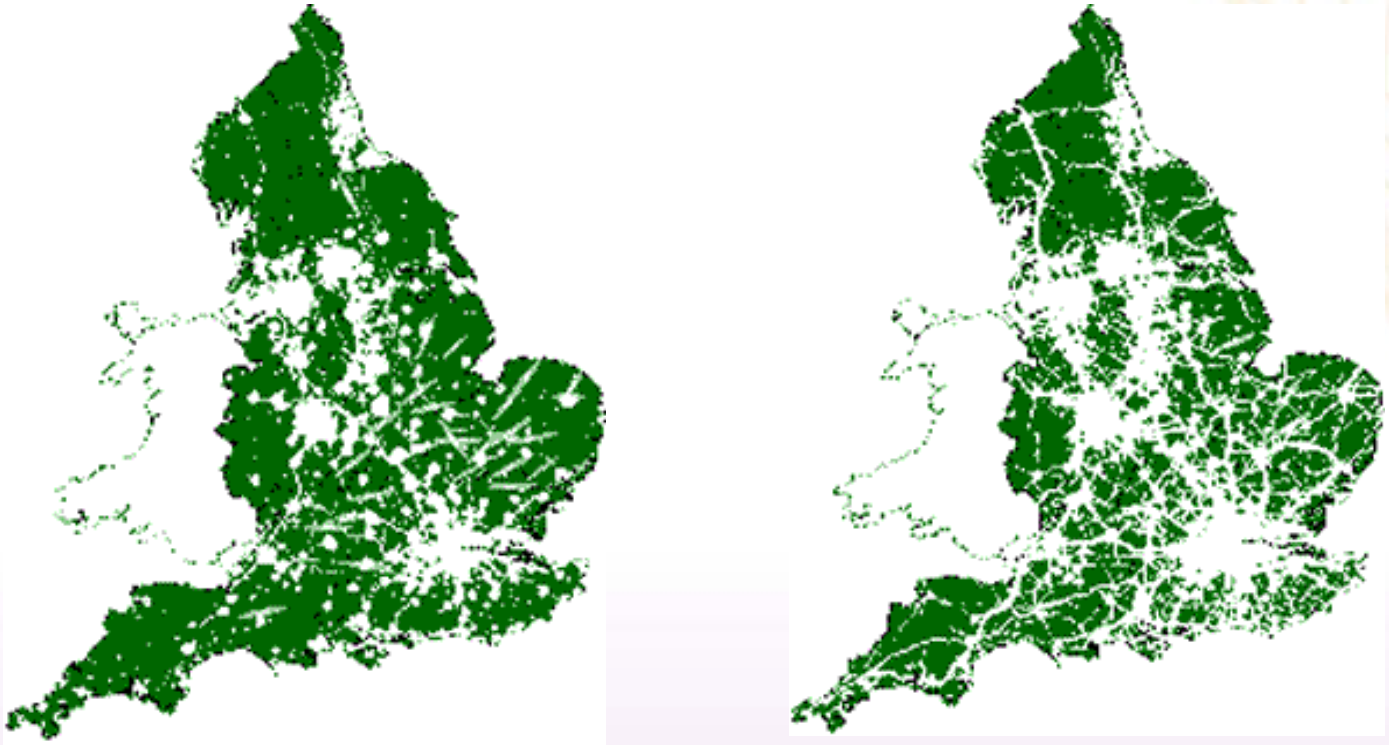
This means we assume that a household elsewhere in UK assigns the same value to a 1dB noise reduction as does a house in Birmingham. DfT believes this assumption underestimates value to UK by 20%.

5. Value of benefits

Based on the Birmingham study and household noise exposure statistics, the minimum benefit to the UK of a 2dB reduction in noise from road traffic would be:

1870 million Euros/annum

6. Achievable reductions?

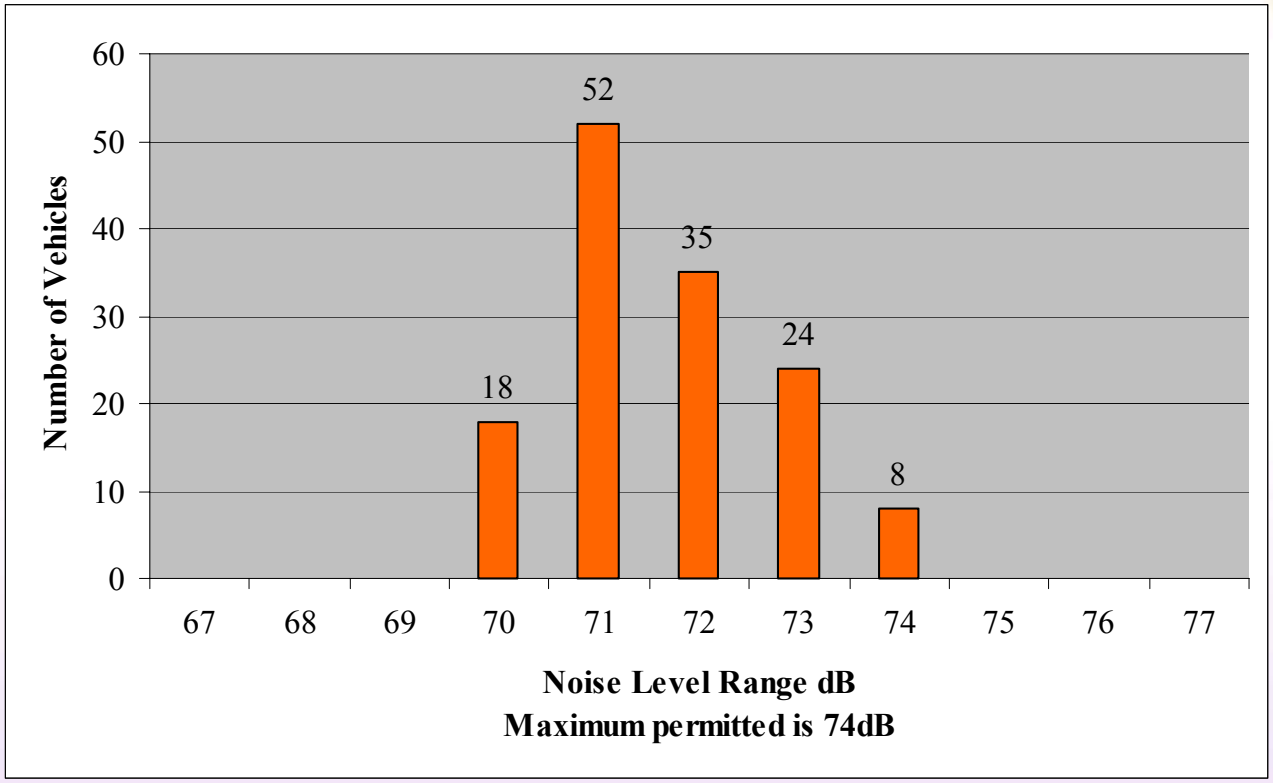


1960s Tranquillity in England 1990s

Source: CPRE and Countryside Agency 1995, www.swenvo.org

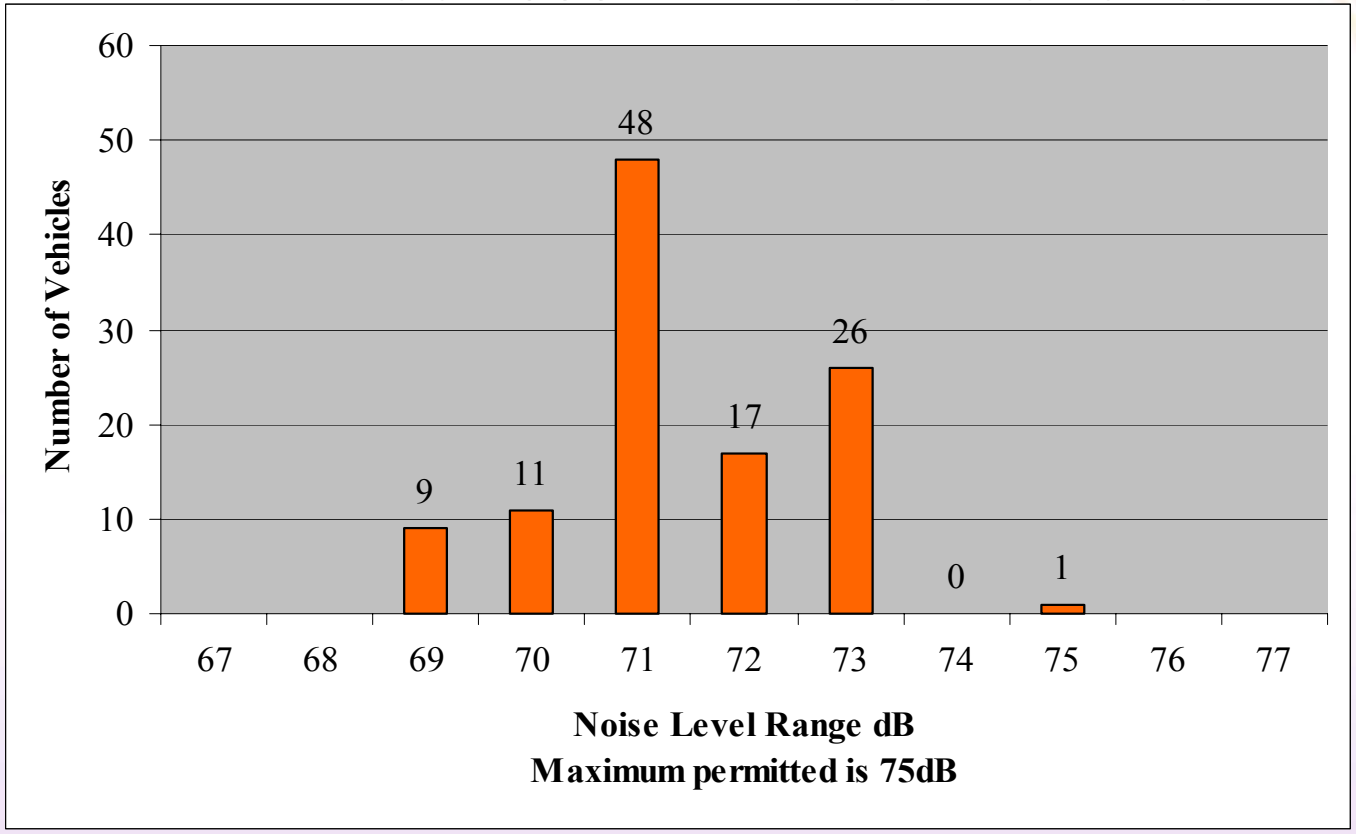
6. Achievable reductions?

Noise emissions of the top ten best selling models in Feb 2005: 137 petrol variants



6. Achievable reductions?

Noise emissions of the top ten best selling models in Feb 2005: 112 diesel variants



6. Achievable reductions?

- **Mean noise values of Feb 2005 models already well within current limits of existing test:**

- **Petrol variants: 71.42dB**
- **Diesel variants: 71.39dB**

- **Would the new test lead to real reductions, beyond ‘business as usual’ developments?**

7. Real roads and test surfaces + Assumption 3

Real roads in the UK do not correspond well with the test surface.

- **From Harmonoise model, TRL ran a simulation as part of the research project:**
- ***'reducing both rolling noise and propulsion noise of light vehicles on the ISO surface by 3 dB will be a reduction on HRA of close to 0.2 dB(A). Near junctions the effects will be closer to 0.5 dB(A)'***

7. Real roads and test surfaces + Assumption 3

Assumption 3:

We assume a 0.2dB reduction on real roads, for a 2dB reduction in noise on the test surface.

This would correspond to a benefit to the UK of a minimum of:

187million Euros/annum

8. Costs to industry + Assumption 4

- 12 companies or industry groups responded to our request for information.
- Several companies preferred the new test and 2dB reduction in 2010 to the existing test with a reduction of 2dB in 2009.
- No overwhelming objection to the 2 dB reduction with the new test.

8. Costs to industry + Assumption 4

- **2 companies provided us with costings for the proposed 2 dB reduction, using the proposed new test method.**

- **Several respondents expected to fit different tyres to their vehicles as a first response.**

8. Costs to industry + Assumption 4

Including a 2dB tightening in 2010, cost per annum to manufacturers of the new test, for all class M1 vehicles sold in UK, would be:

14 million Euros

8. Costs to industry + Assumption 4

Assumption 4:

Costs to industry can be based on cost figures supplied by two manufacturers, with supporting comments from several others.

9. Conclusion

If the new test with a 2dB reduction in the limit were to lead to a reduction of 2dB on real roads, the minimum benefit to cost ratio would be:

134

If the new test with a 2dB reduction in the limit were to lead to a reduction of 0.2dB on real roads, the minimum benefit to cost ratio would be:

13

9. Conclusion

The benefit:cost ratio would be in the range of

13- 134

These are much higher ratios than available with most potential investment projects.

10. Comments

Assumptions 1-4 are important. Particularly:

1. **Birmingham study captures all values (Most)**
2. **Benefit transfer principles can be used (Yes)**
3. **0.2dB(A) reduction in traffic noise from a 2dB(A) reduction on test surface**
4. **We can generalise costs to all manufacturers (Probably)**

10. Comments

1. **Only if the regulation alters the vehicles that are sold, will there be any costs or benefits to calculate.**

2. **We need to know what proportion of vehicles on sale in 2010 would meet the 2dB(A) reduced limit under business as usual.**

3. **What value do households exposed to less than 55dB(A) assign to noise?**

10. Comments

4. **A similar benefit: costs analysis is possible for additional and competing policy options:**

   quiet road surfaces; tyres; voluntary scrapping; speed limits set by traffic level

5. Noise cost per kilometer, e.g. for urban N3:

1.6 - 3.9 Euro cent/vehicle km

So can calculate the noise damage for each vehicle that is registered, over its working life.

11. References

- **The Valuation of Transport Related Noise in Birmingham**

  http://www.dft.gov.uk/stellent/groups/dft_econappr/documents/divisionhomepage/032865.hcsp

- **The State of the Art on the Economic Valuation of Noise, April 2002:**

  http://europa.eu.int/comm/environment/noise/pdf/020414noisereport.pdf

- **The Environmental Noise Directive**

  http://www.defra.gov.uk/corporate/consult/end-two/consultation.pdf

- **'Noise & health: making the link', The London Health Commission, August 2003,** http://www.londonshealth.gov.uk/pdf/noise_links.pdf

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