TECHNOLOGY, SOCIETY AND THE FUNCTIONS OF TRAFFIC NOISE LAWS

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The primary purpose of this article is to examine from a functional perspective both the statutory regulations and the common law relating to traffic noise. Mr. Arup reveals something of the capacity of the law to address modern tensions between technological developments and the "quality of life". In tracing the responses of the legal process to the problem of traffic noise he identifies not only the predominant values and interests which influence the content and enforcement of the law, but also the institutional limitations of the applicable law, which are demonstrated by the problem of traffic noise. In so doing the article examines both the content and practical problems of enforcement of the relevant legislation, drawing on the Victorian experience.

I THE PHENOMENON OF URBAN TRAFFIC NOISE

The impact of the sounds of motor vehicles provides a worthwhile study of the interactions of technological developments, social forces and legal processes.[1] The sounds of motor vehicles are a modern but established, and even common place, characteristic of cities. Experience permits a less tentative assessment of the connections between law and technology[2] in such a field that it can in the more spectacular and exotic areas of nuclear power and genetic engineering.

Traffic noise has spread at the very time in which the legal process itself has become most sophisticated and pervasive. The developments are not entirely coincidental. The use of motorized vehicles has given rise to demands that have had a profound inpact on the legal system.[3] This impact has taken form first, in the increase of business in the courts brought about by claims for compensation of accident victims, and secondly in the institution of various statutory offences for the promotion of public safety. These new rules have been accompanied by the growth of insurance and social security schemes and by the extension of police activities and those of other government authorities.

The legal system has moderated some of the impacts of traffic and sanctioned its spread. Much of the new law is a response to the evident risks of substantial injury by collision, with a guarded extension of liability for the infliction of nervous shock. Concern for the prevention of injury has led the law from the requirement of due care to strict and specific standards of roadworthiness and management of vehicles. However, despite these developments, it seems that the noise level of traffic has not been reduced. Although it is known that, in the absence of compensating equipment, the sound of a

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1 General Works in this area include T. Kuhn, *The Structure of Scientific Revolutions* (1970) and L. Mumford, *Technics and Civilization* (1934).

2 Some interesting work on these connections is appearing, such as, L. Tribe, *Channeling Technology Through Law* (1973) and D. Weisstrub (ed.), *Law, Growth and Technology* (1972).

3 See P. S. Atiyah, *Accidents, Compensation and the Law* (1970).

vehicle rises with the size and speed of its engine, the power of standard models has increased.

Non-standard and ostentatious models (such as "recreational vehicles") have appeared on city roads, and an industry has developed around the modification of in-service vehicles. Furthermore, both the number and the use of vehicles have risen dramatically, also contributing to an increase in the overall level of urban traffic sound. It can be said that the sound of traffic has spread in volume, duration and location.[4] This increase has not, however, been reflected in the development of adequate common law rules or, until very recently, in specific legislative directives. The low level of legal response may be attributed, somewhat speculatively, to a number of factors. Three in particular should be analyzed, but first some observations should be made about the subtleties and imperfections of individual and social reactions to such development.

The spread of traffic has been steady, insidious and, as a consequence, insuffiently pronounced to stimulate assessment. Urban traffic sounds of some kind are not a recent phenomenon (the noise of carts in narrow cobblestoned streets was loud enough) and many people have adapted to the development of vehicular sounds. The whole relationship of technological changes to sensory expectations (and to value formation) is a fluid and interactive one.[5] In overcoming the tension between attitudes and environmental constraints people may accommodate, and even positively assert, those constraints. In the case of the motor vehicle the listeners overlap with the users. Some of the users clearly exalt the technology as a means of escape, speed and exhibition. Although the sounds of traffic are not actually enjoyed, they are accepted as one of the inevitable and irredressible incidents of many private actions by individual members of society.

It is therefore important to identify the process by which the phenomenon has become a "fact of life". Through the market, the environment acquires its character in the culmination of a number of individual decisions to consume made without a conscious and holistic evaluation of the outcome, in Kahn's words, "the tyranny of small decisions".[6] If Hirsch is correct, these separate decisions to maximize personal satisfaction are self-defeating in a populous and inter-connected city, for an activity satisfactory for a few is radically altered and undermined when others seek to join in.[7] Nevertheless, in the event of congestion, and without a system by which collective and holistic strategies can be formulated and enforced, individualistic and competitive reactions are most likely. The listener will attempt to position himself advantageously, by screening out the sound, by retreating to a quieter area or by positively exploiting the sound. Developments in the scale of vehicular traffic, however, are difficult to escape entirely. Cars reach every part of the city. As the city becomes dependent on cars for the conduct of economic and social life,[8] they create pressures for the redirection of scarce resources. As the pattern of urban growth in a twentieth century like Melbourne indicates, the trend is difficult to reverse. Moreover, as the car's use increases, alternative modes of travel are overshadowed: walking, for example, becomes an impractical method of transacting business and maintaining contacts, and uncomfortable and seemingly superfluous pastime.[9]

If this development seems impersonal and unrelenting, it is instructive to ascertain

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4 A. Aird, *The Automotive Nightmare* (1972) 96-117.

5 E. Mesthene, *Technological Change* (1970). *Cf.* J. Habermas, *Towards a Rational Society: Student Protest, Science and Politics* (1968); English Translation (1971) by J. Shapiro.

6 A. Kahn, "The Tyranny of Small Decisions: Market Failures, Imperfections and the Limits of Economics" (1966) 19 *Kyklos* 23.

7 F. Hirsch, *Social Limits to Growth* (1977) 71-84.

8 J. Rae, *The Road and the Car in American Life* (1971).

9 I. Illich, *Energy and Equity* (1973).

whether sections of the community are variously affected by it. If certain groups are advantaged by the ascendancy of this mode of transportation, they may be tempted to influence its course. The distribution of the costs and benefits of the mode is not necessarily even. In contrast to walking, the motor vehicle contributes to the "commodification" of travel; in contrast to the train and trams, it contributes to commercialization.[10] The mode allows for a greater differentiation and individuation in capacities and styles which leads, perhaps, to greater consumption and wealth. At the same time, however, it is less accessible than public transport to such groups as the handicapped, the poor, and the uneducated (at least as owners and drivers), mainly because it is not suited to the pooling and subsidization of costs to enable the extension or redistribution of its services.

At 31st December, 1978, 1,724,399 cars were registered in Victoria and at 30th June, 1979, 1,999,645 drivers' licences were in force. The population of Victoria was estimated to be 3,853,300 at 30th June, 1979.[11] A survey by the Melbourne Board of Works in 1976 provides more information on the distribution of access to vehicles.[12] The Board estimated that over one in six households in the metropolitan area did not possess a car. Also at that time, only 44% of the population held a drivers' licence and a majority of adult women still did not have a licence. Among households with cars there were people who did not enjoy direct access to a vehicle, either because they did not drive, or because the vehicle was routinely used by another householder. A breakdown of these figures by municipality revealed further disparities. Even though people without regular access to a car may occasionally be served by the availability of vehicles in the form of taxis, ambulances, delivery vans and so on, it can be said that the overall benefit to them is less. They are likely to engage more in activities such as walking which must now compete with motor traffic.[13] As traffic volume and type varies with locality, concentrating in the inner and industrial suburbs, the disparity is often aggravated. As private solutions to the noise problem require superior knowledge or capacity to pay, the difficulties of the poor in particular are compounded.

With these points for further investigation, insight may be gained into the responses of the law to traffic noise, particularly with regard to the translation of an awareness of the issue into public action by the creation of a statutory maximum sound level for vehicles in 1976.

Complexities have retarded the formulation and standardization of a maximum sound level. On occasions, these difficulties have been very real, on others, they have served more as means to cloud the issue and to inhibit action. Unsurprisingly, some of these difficulties are caused by limitations in legal forms and processes, but others stem from the character of vehicle noise itself. The first of these complexities is the variety of ways in which traffic noise is both emitted and received. The second is the technology required to reduce the noise. The third is the diversity and incommensurability of the benefits of peace and quiet. Even assuming that a disinterested decision could be made, each of these factors complicates the choice of an appropriate legal form and content.

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10 Hirsch, Note 7 *supra*, 84. See further W. Leiss, *The Limits to Satisfaction: An Essay on the Problem of Needs and Commodities* (1975).

11 State of Victoria, *Victorian Year Book* (1980) 544, 178.

12 State of Victoria, Melbourne and Metropolitan Board of Works, *Research Report on Metropolitan Objective No. 13* (1978).

13 Y. Ng, "Non-Economic Activities, Indirect Externalities and Third-Best Policies" (1975) 28 *Kyklos* 507.

(a) The Character of Noise

Studies[14] of the composition and effects of sound indicate that the extent to which it intrudes and annoys depends not only on the volume but also on such other characteristics as pitch, frequency and duration. Moreover, the threshhold of annoyance is also affected by such individually varying circumstances as the meaningfulness of the sound to the listener, the attitude of the listener to the source of the sound, the activity of the listener, the previous exposure of the listener to noise, and the general health and state of mind of the listener. Again, the incidence of intrusion varies with the proximity of the sound and, in particular, with the directness and distance of its path. Furthermore, the effect of traffic noise is not so much any physical injury but rather the disruption of conversation, work and sleep and, even less tangibly, the disturbance of the enjoyment and comfort that people derive from tranquility, harmony, the beauty of their surroundings, and the like. In all, the impact of traffic and noise is hard to objectify and generalize as common experience and average reaction.

Nevertheless, the variability in spread and response has perhaps been exaggerated. Experiments in laboratories have made connections between noise and psychological well-being[15] and surveys have indicated that traffic noise is the most common single source of annoyance among urban sounds. For instance, in a recent survey[16] in Brisbane, interviewees nominated general traffic noise as the worst intrusion, with motor cycle noise fourth and heavy transport fifth. In terms of general levels, these surveys have led experts to postulate a median threshhold annoyance level around 68dB(A).[17]

(b) The Available Technology

It would seem reasonable to keep noise level requirements within the bounds of the technology available to reduce it. In this way, reduction beyond a certain point may be presented as beyond the reach of present technology. To reduce the noise any further, vehicles must be removed from the road. While traffic management may influence the purpose and number of trips made, society cannot exercise sufficient control to limit the dissemination of vehicles. To that extent, the technology of the car has become inevitable:[18] once the capacities of the car are known, individuals go to great lengths to partake of it. As popularity grows, the economic conditions of whole industries and regions become dependent upon the future of the car.[19]

It is important, however, not to characterize the assertions of the inevitability of the car or of the impracticality of modifications, as disinterested and objective truths. The spread, and the character, of the car are the outcome of choices in society. With respect to the noise of motor vehicles, there are many points of development, distribution

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14 See C. Bragdon, *Noise Pollution* (1971); M. Dumunesil (ed.) *Organization for Economic Co-operation and Development, Urban Traffic Noise: A Strategy for an Improved Environment* (1971).

15 F. Langdon, "Noise and Man" in A. Alexandre, J.-Ph. Barde, C. Lamure and F. Langdon, *Road Traffic Noise* (1975) 1.

16 Conducted by J. Damm and ors, Department of Psychology, University of Queensland (as yet unpublished).

17 F. Langdon, "The Problem of Measuring the Effects of Traffic Noise" in A. Alexandre, J.-Ph. Barde, C. Lamure and F. Langdon, Note 15 *supra*, 27, 59.

18 On the general question of technological determinism see R. Heilbroner, "Do Machines Make History?" in M. Kranzberg and W. Davenport (eds.), *Technology and Culture* (1971). See also H. Marcuse, *One-Dimensional Man* (1964).

19 G. Bloomfield, *The World Automotive Industry* (1978); P. Stubbs, *The Australian Motor Car Industry: A Study in Protection and Growth* (1972).

and use at which more moderate restrictions can be applied with effect, if society values the reduction in noise above the necessary inhibition in the producing activity. After all, the course of technologies are shaped by the forms of economic organization and the value systems of different eras.[20] If the necessary technique to silence vehicles has not yet been developed, a choice has been made not to allocate sufficient resources to do so, especially now that most research and development is planned and institutionalized with significant government support.[21]

In fact, many of the pertinent techniques are already realized, but the most effective in reducing noise are not necessarily the most practicable given that the car has been in use for some time. In particular, the design of individual buildings and the layout of urban areas can reduce noise further than the modification of vehicles, but in many cases it is too late to act or too costly to redress past errors.[22] At the same time, research reveals that measures easier to institute such as the erection of screens and barriers, while effective, are unsightly and clumsy.[23] Nonetheless, research presents a larger range of measures for consideration: for example, an appreciation that sound intrudes not only when it is voluminous, but also when it stands out against the background, directs attention to traffic routing measures such as synchronized lights for improved flows and restrictions on vehicles in residential areas especially at night.[24] Also, as the noise from the tyres and the aerodynamics of the vehicle increase with velocity, speed limits are pertinent.[25]

In a city such as Melbourne, it still seems unlikely that most can be segregated or shielded fully from motor vehicle noise either in the buildings or in public places. Within such constraints, control might be most effective at the source of the noise. Research has identified those parts of the vehicle which contribute most to the noise level and those which can be most easily improved. On the one hand, sealing or shielding of the engine reduces noise considerably, but it seems that it creates new problems such as overheating.[26] On the other hand, equipment bolted on to the basic driving parts is less effective in reducing noise and also detracts from power.[27] Therefore, depending on the extent of reduction desired, technical efforts need to be directed to the re-design of the vehicle, for example, in the geometry of the cylinders engaged in combustion.[28] Re-design might also produce parts that last longer and are harder to tamper with. Manufacturers have already demonstrated that quieter cars can be produced, at least in the luxury range; to ensure that cheaper cars are quieter, a trade-off with power or some other option *might* be necessary. Some manufacturer and industry resistance to a strict standard is to be expected, for clearly there has been a steady market for powerful (and noisy) cars. From their perspective, however, the point of the trade-off is not static: higher petrol prices are leading to a demand for less powerful vehicles and even for alternatives to the internal

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20 D. Landes, *The Unbound Prometheus: Technological Change and Economic Growth from 1750 to the Present* (1969); H. Braverman, *Labor and Monopoly Capital* (1974).

21 Commonwealth of Australia, *Australian Science and Technology Council, Industrial Research and Development: Proposals for Additional Incentives* (1980) 15.

22 G. Vulkan and A. Gometsall, *Traffic Noise: A Review and Bibliography on Surface Transportation Noise* (1978) A–1.

23 C. Lamure, "Methods of Traffic Noise Reduction", in A. Alexandre, J.-Ph. Barde, C. Lamure and F. Langdon, Note 15 *supra*, 130.

24 G. Vulkan and A. Gomersall, Note 22 *supra*, A–3.

25 C. Lamure, "Noise Emitted by Road Transport" in A. Alexandre, J.-Ph. Barde, C. Lamure and F. Langdon, Note 15 *supra*, 85.

26 D. Anthrop, *Noise Pollution* (1973) 76.

27 A. Aird, *The Automotive Nightmare* (1972) 118.

28 D. Anthrop, Note 26 *supra*, 76.

combustion engine. Still, with car manufacture in the hands of a few companies, and with economies of scale required for mass production, the manufacturers demand a large market for their models or the components that reduce noise. Consequently, legislators in Australia are under pressure not to exceed the standard struck in the manufacturers' other markets interstate and overseas.[29] Even the bolt-on components, which are easier to vary than the engines, are made overseas.

(c) Valuations

It would be misleading to characterize the dispute over vehicle noise simply as a technical, fact-finding exercise. Decision-making in this area ultimately requires, a methodical and dispassionate determination of whether trade-offs between driving and quiet are to be made and, if so, in what proportions. Those individuals, organizations and authorities which may make the decisions must determine which claims have worth, and then rate them to the extent that compromises and choices have to be made between them.

In the case of noise, the benefits and savings from a quieter environment must be set against the costs of reducing the noise level of vehicles by engineering and other devices and these include the impact on industry and commerce if vehicles are to be more expensive. A fair comparison is difficult because many of the benefits of peace and quiet are non-marketables and intangibles, which are not amenable to reduction to a unit as commensurable and aggregable (or appealing) as the dollar figure that can be placed on the costs of reduction.[30] It is not surprising that more attention is given to the material and tangible costs of noise such as its impact on productivity and the level of health care.[31] Nevetheless, the account would be incomplete without an indication of the aesthetic and amenity values of peace and quiet and the psychological satisfaction of feelings of safety and harmony. However, these benefits, to the individual and to society, are difficult to portray and to compute,[32] so, to bring them squarely into accounts with the economic factors, proxy market indicators have recently been pursued. With regard to peace and quiet, the relevant indicators include wage rates for travel time accorded to quiet places, and the differences in property values in quiet zones.[33] Despite the merits of the attempt to bring them into account, these indicators revive the shortcomings of real market prices as a measure of the valuation of such benefits. Many factors other than noise levels contribute to these prices and they cannot always be controlled. Furthermore, as the concept of the consumer surplus suggests, the property value of a house, to take an example, may not represent such dimensions of satisfaction as are moulded by sentimental attachments, community ties and so on.[34] In attempting to penetrate these subleties, surveys have been employed to discover what individuals are willing to pay for peace and quiet. While they provide an additional guide, attitude surveys as indicators

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29 Commonwealth of Australia, Department of Transport, *The Australian Design Rules for Motor Vehicle Safety and Emission Control: A Review of the Development and Administration of the System* (1976) 17.

30 M. Baram, "Cost-Benefit Analysis: An Inadequate Basis for Health, Safety and Environmental Decision-Making" (1980) 8 *Ecology Law Quarterly* 473.

31 D. Starkie and D. Johnson, *The Economic Value of Peace and Quiet* (1975); L. J. Seidler and L. L. Seidler (eds.), *Social Accounting: Theory, Issues and Cases* (1975).

32 L. Tribe, "Policy Science: Analysis or Ideology?" (1972) 2 *Philosophy and Public Affairs* 66, 96.

33 J. Sinden and A. Worrell, *Unpriced Values: Decisions Without Market Prices* (1979).

34 J. P. Lewis, *Urban Economics* (1979); A. Alexandre and J.-Ph. Barde "The Social Costs of Noise", in A. Alexandre, J.-Ph. Barde, C. Lamure and F. Langdon, Note 15 *supra*, 70.

of valuations also encounter many practical difficulties which undermine their reliability and sufficiency.[35]

Nevertheless, so long as the contribution of noise can be isolated, the dollar measure of the costs and benefits is a guide to decision-making when the goal is allocative efficiency or the maxmization of wealth. They indicate when it is cheaper for the listeners to withstand the noise or to take their own steps to avoid or ameliorate it than it is for the noise-maker to reduce the noise, even if the maker has to compensate the listeners for their efforts. Once willingness and capacity to pay are considered inadequate gauges of welfare, then other sources of valuations are also required in order to make policy choices. In this view it is notable that subjective and intangible satisfactions are also bound up in the valuation of the benefits of noise and of the freedom to make it. Many vehicles are not used simply for transport and, indeed, all sorts of social significance attach to them. Certain groups devote a large amount of time and feeling to the production of a noisy car in order to obtain the satisfaction that flows from a domination of the environment, from the attention paid to the driver, and from the relief of uncomfortable silence. Furthermore, the freedom to choose, amongst other things a noisy car, is valued as an end state, even if the choice is shown to be inefficient. A high cost is consequently attributed to the policing of a restriction. It is not uncommon to regard the car as an extension of the self, translating the traditional liberties of the individual into those of the individual in his car.[36] The intensity of feeling of some for the car makes them less sensitive either to monetary incentives[37] or moral strictures.[38]

The valuation of non-marketables and intangibles is expressed from time to time in the political process. Elite groups and sectional interests operate to define problems and obtain action. A changing valuation of the "quality of life" reflects a growing sophistication in the understanding of the connections between congestion and the well-being of the community and a rising affluence in which a higher margin value is attached to amenity because the material necessities are secured. These conditions appear among some sections of Australian society in the late 1960's and early 1970's. However, such a shift threatens the interests of those whose earnings stem from the activity in question, in this case, the car manufacturers and those engaged in transportation. If the advocates of regulation have any force, the industry can be expected to take some defensive action.

In an enquiry into the justification for a policy on traffic noise, the analyst would thus consider the distributional effects of the various alternatives and, in particular, employ procedures sensitive to the detection and display of the character of the groups affected by decisions, the importance of the alternative outcomes to their well-being, and the intensity of their feelings about the options.[39] Certain groups are better placed than others to promote their values and interests.

It does seem that urban traffic noise now reaches all economic groups even if the wealthier are better able to soften its impact. An enquiry into its effects should ascertain whether those that benefit from the use of motor vehicles share equally in its costs. If any section suffers the noise disproportionately, that group may well be underprivileged

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35 N. Clark and L. Segal, *Techniques for Placing Monetary Values on Environmental Damage* (Paper for a workshop on measuring environmental damage costs sponsored by the Commonwealth Department of Science, 1979).

36 J. Flink, *The Car Culture* (1975); W. Plowden, *The Motor Car and Politics 1896-1970* (1971).

37 Note 3 *supra*, 578.

38 E. Braybrooke, "The Sociological Jurisprudence of Roscoe Pound" (1961) 5 *U. Western Aust. L. Rev.* 288, 304 and 320.

39 State of Victoria, Country Roads Board, Project Evaluation Study, *"Project Evaluation – The State of the Art"* (Technical Report No. 61, 1975).

in other ways and, in particular, less able to bargain, pressure or pay, in order to obtain an effective solution to their problem. Children, and elderly people, are likely groups. Similarly, the enquiry should consider how the burdens of a policy of restriction would be distributed. If a policy increased the cost of vehicles and that cost was passed on to the consumer, then the poor would be the first to cease motoring; if a tax was placed on the noisier models, the wealthy would be the last compelled to travel quietly. If the cost were not passed on, those involved in the vehicle industries would be affected. In identifying strategies, it might still prove sensible to proceed with a restriction and to redress the distributional effects by an indirect means such as subsidies.[40]

Theoretically, criteria other than allocative efficiency and distributional effects might be employed in the formulation of policy and, particularly, in the valuation of the costs and benefits of noisy vehicles and quiet surroundings. On moral grounds, for example, the claim to the satisfaction that stems from the imposition of noise on others irrespective of, and possibly against, their will might easily be ranked below the claim to a quiet neighbourhood.[41] In keeping with certain philosophies, respect might also be required for the well-being of natural objects such as birds and animals, quite apart from their value to man as, for example, edible or ornamental species.[42] The addition of these sorts of considerations further complicates the choice of appropriate legal form and content. It makes even more significant the source of authority and the capacity of the decision-makers. The article now turns to the nature of the decision-making in tracing the recent responses of the law to traffic noise.

2 LEGAL RESPONSE

(a) Contract

In a wholly market system, the measure of the level of quiet preferred is the willingness to pay for quiet vehicles as this is expressed in the market. In this state of affairs, the listener does not begin with an entitlement to a quiet state and the attendant protection from the intrusion of noise. Rather, the producer has the freedom to make the noise to the extent he is naturally endowed to do so, even with the aid of mechanical devices such as the motorized vehicle. The law defers to a distribution of benefits that favours the noise-maker.[43] The system does not operate, however, without the support of some law: if the listener sought to interfere with the noise-maker's entitlement by self-help, to impound, remove, obstruct or modify noisy vehicles, he would be subject to criminal and tort law.

Instead, the listener must seek to alter the balance and to contract with the noise-maker to buy off his entitlement. In a market system, the law supports freely alienable property entitlements and the contracts made to effect them.[44] It does not prescribe the terms of the exchange and, in particular, the value of the entitlement. In the driver's contract with the dealer or the garage, no account is taken of the effect on the listeners of the noise of the vehicle, unless the purchaser himself attaches a value to the non-

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40 G. Calabresi and A. Melamed, "Property Rules, Liability Rules and Inalienability: One View of the Cathedral" (1972) 85 *Harv. L. Rev.* 1089, 1116.

41 G. Schwartz, "Economics, Wealth Distribution and Justice" (1979) 3 *Wis. L. Rev.* 799, 807.

42 C. Stone, "Should Trees Have Standing – Towards Legal Rights for Natural Objects" (1972) 45 *So. Calif. L. Rev.* 450.

43 G. Calabresi and A. Melamed, Note 40 *supra,* 1108.

44 R. Posner, *Economic Analysis of Law* (1972).

infliction of noise upon others. The noise is then an externality: as the O.E.C.D. puts it, "noise is the side effect of the private action that imposes an unwanted cost on third persons who are not partners to the action".[45] As listeners and drivers overlap, the drivers might be expected to relate the two activities and colour their demand on the sellers to obtain a quiet model (and maintain their vehicles accordingly), but some drivers do not relate the two roles and others do not object to the noise. Concerned drivers have no guarantee others will follow suit and as the quiet can be broken by one vehicle, especially if driven in a certain manner, the conditions will not be proportionately improved by a growing number of considerate drivers.

Similarly, individual listeners meet difficulties if they attempt to bribe drivers to buy and run quieter vehicles. In a situation free of transaction costs, the listener will negotiate with the maker if the listener can see that it is cheaper for him to pay the maker to take steps, such as to refrain from driving or to modify his vehicle, than it is for the listener to move from the noise, or screen it out, or to repair the damage it does, or to withstand it.[46] The noise-maker is under no obligation to bargain and he may not see eye to eye with the listener regarding the benefits of the noisy activity and the costs of reducing it. In any case, a bargain is likely to secure only a small drop in the overall noise level. The very real transaction costs of negotiating the transfer of entitlement are likely to outweigh any gain. Indeed, in some situations, it will be logistically daunting for the listener to initiate negotiations with the makers, particularly so in the case of the drivers passing by rather than the neighbour generating traffic from his property.

Can the listeners come together, privately but collectively, to organize a sufficient bribe? There would remain the problem of matching this group against the often numerous and varying perpetrators. In any case, as Calabresi and Melamed so ably point out,[47] the problems of combination are likely to be defeating. The risk of exposure to noise, the impact of the noise, and the value placed on peace and quiet, will vary between individual listeners; some are prone to understate the amount they are willing to pay, or to hold out, in the hope that they can free-ride on the quiet the others secure. In any case, it may be logistically impossible to collect all the concerned listeners. The problems increase in the case[48] of an area people use infrequently or for a limited period, such as a park or even a work place, or an area they may never use but like to know exists as a sheltered domain in a time of need, or even as a haven for other people and for birds and animals.

Due to the presence of externalities and intangibles, the market may thus fail to produce the efficient outcome. Furthermore, whatever the efficient result, society might consider that it is inequitable, or improper, for the listeners to be compelled either to bribe the producers, to take their own evasive action, or to accept the noise (at least in the absence of some effective compensation).[49]

(b) Liability Rule – Nuisance

For the reasons of market unavailability and failure, and the absence of a mechanism to collectively value the quiet and to enforce compliance with that valuation, Cala-

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45 O.E.C.D., *Urban Traffic Noise,* 13.

46 G. Calabresi, "Transaction Costs, Resource Allocation and Liability Rules – A Comment" (1968) 11 *J. L. & Econ.* 67.

47 G. Calabresi and A. Melamed, Note 40 *supra,* 1108.

48 B. Weisbrod, "Collective-Consumption Services of Individual-Consumption Goods" (1964) 78 *Quarterly Journal of Economics,* 471-477.

49 L. Tribe, "Technology Assessment and the Fourth Discontinuity: The Limits of Instrumental Rationality" (1973) 46 *So. Calif. L. Rev.* 617, 629; A. Kronman, "Wealth Maximization as a Normative Principle" (1980) 9 *J. Legal Studies* 227, 239.

bresi and Melamed accept some liability rules.[50] In the presence of a liability rule, provided transaction costs are symmetrical, the maker will only continue with the noise if it is cheaper for him to compensate the listener than to refrain from driving or to eliminate the noise. In this position he may continue if he pays out the listener who asserts the liability rule. But, as the following analysis reveals, there are inadequacies also in the operation of a liability rule. Transaction costs and other inhibitions attach not only to negotiations around an inefficiently allocated liability obligation, they also attend to the litigation of a right to compensation.[51] Furthermore, some of the injurious effects of noise cannot be adequately met by monetary compensation to the plaintiff and the liability rule does not readily extend to the interests of the many who will be indirectly affected by the noise.

Nevertheless, if the listener's interests are to receive the minimum recognition and protection, a liability rule is required in order to create a bargaining relationship between the maker and the listener. Tort law has served this function in response to the new technology but, as Horwitz documents,[52] the thrust of the tort law has been somewhat blunted in the modern era in order to promote the active development of land and other resources. Negligence outstripped strict liability, private and public nuisance were distinguished, and parties were permitted to contract out of tortious liability. Liability for negligence has not proven to be a more effective constraint on noise, for example traffic noise, than the older form of action of trespass to the person. The reasons for this lie as much in the substance of these causes of action as in the procedural requirements of civil actions in general. For negligence to be established the plaintiff must prove actual damage, reasonable foresight of the risk of damage, and the absence of reasonable precautions. In respect of assault, the plaintiff must prove that the defendant intended to apply force to him.

In substance, nuisance is the cause of action most relevant. A few cases of litigation in nuisance against noise can be found in the law reports. These cases are not an indication of a widespread dissatisfaction with traffic noise, but neither are their small numbers an indication of a general acceptance. Of the various reasons why people do not sue, or at least go to trial or appeal, only a few stem from the peculiar characteristics of the noise problem. The costs of a court action can be an obstacle to the assertion of rights; an obstacle which in some cases is a useful deterrent to frivolous or vexatious litigation, in others, a source of injustice. This shortcoming of the process is not especially aggravated in the case of noise unless the stake of the listener if far outweighed by the costs of litigation, or that listeners, on the whole, are rather poor.

Kidman v *Page*[53] has been used here as an instance of the substantive and procedural requirements for success in an ordinary action in nuisance against traffic noise. The litigation arose out of the defendant's operation of a road hauling business in a working-class, residential suburb of Brisbane in 1959. The plaintiff, who lived near the intersection, complained of noise caused by the defendant as he started up his trucks in the early morning, drove the trucks up and down a gravel road, operated repair equipment and "revved" the trucks in his workshop at night and on weekends. In the Supreme Court the Trial Judge ordered the defendant to refrain from "revving" the trucks in a noisy

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50 G. Calabresi and A. Melamed, Note 40 *supra*, 1106.
51 R. Cranston, "Creeping Economism: Some Thoughts on Law and Economics" (1977) 4 *British Journal of Law and Society* 103, 109.
52 M. Horwitz, *The Transformation of American Law 1780-1860* (1977).
53 [1959] Qd. R. 53.

manner, and to drive the trucks in and out of his premises at a slow speed, adding that failure to comply with these directions would lead to the issue of an injunction.[54] The defendant was also ordered to pay one third of the plaintiff's taxed costs.

In this case, the plaintiff enjoyed a measure of success. He obtained a specific order against the defendant. Nevertheless some of the existing noise was allowed to continue. The Judge, after inspecting the site, found that there was noise intrusion but felt it necessary to add that "a motor truck may be the source of a great deal of noise but in these days of mechanical living even a country resident cannot expect a soundproof home or an idyllic retreat".[55] The defendant was permitted to continue his business provided he complied with certain, inexact conditions. The risk of fresh noise was not countered. As the hauling contract which required the defendant to start up at 5.30a.m. had run its course, the judge made no order as to the times at which the vehicles could be driven. Yet no evidence was taken of the likelihood of a recurrence; in any case, the judge considered most people would be awake in this type of suburb at 5.30a.m.[56]

Of the interests recognized and ranked, the Judge declared that the right of passage does not amount to a right to make the life of other residents intolerable. It is not sufficient for the defendant to say that the noise is inherent in the conduct of his business, yet the plaintiff must be prepared to endure some noise. In the Judge's opinion the degree of intrusion, in the context of the locality, time of day and the pattern of the noise (frequency, duration, intensity, etcetera), must be balanced against the burden of restrictions on the defendant's business.[57] At the same time, the report of the case provides no evidence that the Judge obtained a scientific recording of the noise levels, a costing of the precautions that either the defendant or the plaintiff could take against the noise, or a quantified valuation of the benefits of the continuing business as against a state of peace and quiet.

In an imprecise manner, the decision attaches some weight to the plaintiff's interest in the comfort, convenience and peace of his residence, at least as far as his sleep, work and communications are affected by the noise. Even so, this is only to the extent to which an ordinary person would suffer interference. Noise that only constitutes an interference by the requirements of dainty and elegant notions or abnormal sensitivities and uses, does not attract liability, even if the cost of suppressing it is little, provided that the noise is not maliciously inflicted. In *Bloodworth et ux* v *Cormack*, the Court was not prepared to take into account the impact of speedway noise on some local residents who were in ill-health, remarking that "this branch of the law pays no regard to the special needs of invalids".[58] In contrast, in *Spencer* v *Silva*,[59] the South Australian Supreme Court considered that the impact of sawmill noise upon an elderly couple could be taken into account. The abnormality of a sensitivity is influenced by the proportion of the community experiencing it: the plaintiff's claim is enhanced if he can adduce a large number of supporting witnesses. The reputed character of the locality is also influential. The manner in which the representativeness of the plaintiff's concern is determined seems rather crude; a proper survey would be more accurate, although, of course, the costs and benefits of precise information are further items in the account for the dispute. All the same, a policy whereby, a priori, no worth is attributed to abnormal sensitivities

54 *Id.*, 66.
55 *Id.*, 55.
56 *Id.*, 64.
57 *Id.*, 60.
58 [1949] N.Z.L.R. 1058, 1064.
59 [1942] S.A.S.R. 213, 219.

and activities may underestimate the value of their recognition. Indeed, it might seem inequitable or unfair not to respect these sensitivities, particularly those that are fundamental or involuntary attributes of their bearers.

Ideally the marketeers would prefer the law to leave the parties to determine the extent of their preference for quiet than to intervene in placing its own value upon it; if the law does intervene, care should be taken to allocate entitlements and corresponding obligations efficiently. In Calabresi's terms,[60] the legal obligation should be imposed on the category of party who can most cheaply avoid the costs of the activity and failing that, upon the category of party who is best able to initiate negotiations and bribe the cheapest cost-avoider so to act. If it were certain that the listeners were that "party", then the pollutors might be left free to make noise in the absence of a private contract with the listeners not to do so. If, on the other hand, it was not clear which of the two categories was the appropriate party, compensation would be most apt; indeed, if it transpired that the pollutors were clearly the appropriate party, the listeners might be entitled to injunctive relief.[61] In the face of possible liability, the noise-maker must bargain with the listeners if he can see that it is cheaper to compensate the listeners than to cease the noise-making activity or take precautions to minimize the noise level. Those commentators of a free market inclination are concerned that the listeners, if the maker is required to obviate or compensate, might exaggerate the benefits to them of quiet and not be motivated to act themselves to minimize the impact of the noise. Indeed, if the law does not place the obligation on the party who can more cheaply prevent or remedy the damage, and the transaction costs of privately negotiating a reallocation outweigh the gain in efficiency of doing so, the more efficient use of resources and the maximization of overall wealth are obstructed.[62]

In the case of traffic noise it is not clear that the listeners can, as a rule, avoid the harm more cheaply. On the whole, the drivers seem the better cost-avoiders of the two and yet it would be dogmatic to insist that this is so clear that the listeners should be entitled to a prohibition by way of injunction on every noisy action. The variations in the perceptions and positions of the listeners have been noted; the drivers also vary, for instance in the amount they drive, the vehicles they drive, the places and occasions they drive to, and their reasons for doing so. While they are only partly responsible for the pattern and manner of use of vehicles, the manufacturers might appear the most prominent actors because of their small numbers, large size, and influence the quality of the vehicle initially. However, it would seem even more difficult, both conceptually and procedurally, to connect them with the listeners by the common law action of nuisance.

Such uncertainties and variations[63] suggests that, in the operation of a liability rule, individualized judicial determinations may be required in which balances are struck and apportionments made. It is common in this context to make a major distinction[64] between injunctions and damages as entitlements for the pollution victim. It would be unwise, however, to conclude from the availability of the injunction in some cases of nuisance that the listener's interest was in any way secured or absolute. As a civil remedy, the injunction is only obtainable if the listener is prepared to initiate an action against the noise-maker and then its grant depends in turn on the making out of the cause of

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60 G. Calabresi and A. Melamed, Note 40 *supra*, 1096. See further A. I. Ogus and G.M. Richardson, *Economics and the Environment A Study of Private Nuisance* (1977).

61 A.I. Ogus and G.M. Richardson, *Id.*, 308-314.

62 R. Coase, "The Problem of Social Cost" (1960) 3 *J.L. & Econ.* 1.

63 See also the discussion accompanying footnotes 15 to 29 *supra*.

64 A.I. Ogus and G.M. Richardson, Note 60 *supra*, 293-294.

action (that is, substantial and unreasonable interference with the enjoyment of the listener's land) and on the satisfaction of equitable considerations, for example, the balance of convenience. As in *Kidman* v. *Page*,[65] the injunction may only be a partial restraint on the noise-making activity; there are various ways in which the order can be softened.

For these and other reasons, injunctions and damages can be treated together and usefully compared as instruments of a liability rule with the legislative directive of the State. With regard to traffic noise, the costs of litigation, especially given the numbers and diversity of the drivers who gradually and cumulatively impose on the listener as compared with the repeated inflictions of a neighbour, are a real deterrent to the assertion or pursuit of a civil remedy. Particularly where liability is not clear-cut and uniform the call for judicial determinations imposes the cost of the administration of the courts and the like upon the taxpayer.

Epstein's response to the costs of a liability rule is to suggest that the harm is better left where it initially lies, so long as its infliction is broadly reciprocal, particularly if the harm is only low-level.[66] In a rough way, the damage will even out, but, as he concedes, reciprocity is not always perfect, regarding either participation in the harmful activity or sharing in its burdens. So far as traffic noise is concerned, while drivers and listeners do overlap to some extent, it is not clear that all groups share equally in its infliction and absorption. On the other hand, Epstein suggests that if uncertainties in the application of a substantive rule give rise to many errors in individual decisions, the system might be better off with a gross and imperfect rule of easy application.

> Uncertain outcomes have many sources: the issues to be litigated may become less amenable to precise measurement and more open to honest differences of opinion; fraud and concealment may abound; and good evidence on essential questions may be hard to find.[67]

As a result of this need to simplify in order to manage the issues, the civil process fails to account adequately for several of the concerns that noise affects, such as those of an intangible, long-term or holistic nature.[68]

In a conflict between maker and listener, a court may be called on to determine, in part, whether the interference is unreasonable, where the balance of hardship lies, whether damages are an adequate remedy, and what amount of damages to order. Comparisons must thus be made between very real monetary costs and intangible satisfactions, and, at least if damages are awarded, a figure must be put on the intangibles. The difficulties are acknowledged by the courts. If there can be no set-off, particularly if one side's claim is incalculable or indivisible, the court is faced with an "all-or-nothing" decision. In any case, the court must attach a weight to the intangible claim. By the time an action can be mounted, the defendant has committed resources to the noise-producing activity and the Court is unlikely to favour a listener. The interest of one listener will compare badly with that expenditure: it will seem insufficient to warrant an injunction, or even to constitute a substantial interference necessary to establish the cause of action. At the same time, the steps the listener is able to take, even with the aid of a monetary award, have been contracting as the traffic has increased. The monetary award thus serves largely, and perhaps improperly, as a solace. Where compensation alone is available, no minimum environ-

65 Note 53 *supra.*

66 R.A. Epstein, "Nuisance Law: Corrective Justice and Its Utilitarian Constraints" (1979) 8 *J. Legal Studies,* 49, 84.

67 *Id.*, 76.

68 L. Tribe, "Ways Not to Think About Plastic Trees", in L. Tribe, C. Schelling and J. Voss (eds.), *When Values Conflict* (1976) 64, 65.

mental condition is upheld: if the polluter pays the tariff, he may intrude on the autonomy of the listener so that, in a sense, the listener's entitlement can be compulsorily acquired. To take the point further, it is worth noting that the listener can prevent the acquisition if he is assured of an injunction, yet he is free (he may be either willing or desperate enough) to sell his entitlement to the polluter and no third person may interplead. Of course, it sounds somewhat extreme to speak of the violation of fundamental environmental conditions in relation to the present traffic noise, for it is usual to consider guarantees of life, physical safety, freedom of movement and the like, at least first. The concern, however, about the private alienation or acquisition of aesthetic and psychic conditions is not simply paternalistic; it also stems from the recognition that these private decisions affect a wider group than the immediate parties.

The civil process channels these conflicts into the narrow and immediate issue of ranking or setting off the claims of individual parties with direct and present interests in the activity. Cases are only commenced on the initiative of such parties and a solution to the problem can be curtailed by a private settlement or an award of damages to the particular plaintiff. Despite an activity with broad, diffuse or long-term external effects, the impact on many others, even future generations if the activity continues, does not have to be brought into account.[69] An area may slowly degenerate as a consequence of heavy traffic. Similarly, the impact on commercial activity, employment and the level of services if the activity is stopped, is not considered. In particular, the remedy in private nuisance is confined to interferences in the enjoyment of one's own property. Yet, traditionally, city life has been distinguished by the social contact and observation afforded by street life and public places. The impact of urban traffic noise on the enjoyment of such recreation areas as Melbourne's bayside beaches could be challenged by very few private citizens, for few could establish private nuisance or standing to sue in public nuisance.[70]

It would be incorrect to say that the impact of every case is confined to its parties: the rules enunciated may create standards for the behaviour of others and, in the great cases, the courts consider this wider impact, most notably in their reluctance to impose new standards with widespread, but uncertain, consequences. However, in the case of nuisance and traffic noise, the standard is too vague and complacent, and the litigation too haphazard, for the prospect of liability to serve as a deterrent to drivers or as an impetus to manufacturers to redesign the vehicles available.

(c) Town Planning Permits

In the usual analysis, a mandatory legislative standard would be the next object of consideration but the impact of noisy activities on the amenity of neighbourhoods requires some mention of the planning schemes. The relevant town planning response to clashes between development and quiet enjoyment is to segregate the uses or to place conditions upon the permission to engage in an activity with negative side-effects in order to reduce the impact.

In the planning process, schemes are prepared by expert agencies and local councils, submitted to public scrutiny, and then enacted into law. At this formative stage, the broad zoning of areas is made according to the criteria set out in the enabling act that include regard for some intangibles. While each scheme both permits and prohibits some uses out-

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69 L. Tribe, *Channeling Technology Through Law* (1973).

70 L. Pearson, "Locus Standi and Environmental Issues" (1980) 3 *U.N.S.W.L.J.* 307; See also *Howes and Ors* v *Victorian Railway Commissioners and Ors* (1970) 23 L.G.R.A. 227.

right, a large area of discretion is left to the administering authority to decide whether to permit certain uses, perhaps attaching conditions to the permit. Any individual may object to the authority against the granting of a permit, but the authority's deliberations are political and administrative rather than judicial. Nonetheless, both the applicant for a permit and the objectors may appeal against the authority's decision to an appeals tribunal; so may any other person "aggrieved" by the decision, provided someone objected to the grant in the first instance.

The tribunal, using the Victorian system as an example, is constituted by a person with town planning experience, a person with development experience, and a lawyer in the chair. The criteria the tribunal may apply in its decision are broader than those of the administering authority and it is not possible to state those criteria exhaustively. All the same, two established principles are of particular significance to the conflicts between noisy activities and quiet enjoyment. First, the tribunal will consider whether the use in question would be detrimental to the amenity of the area. The amenity of an area is "those qualities and conditions in the neighbourhood which contribute to the pleasantness, harmony and coherence of the environment and to its better enjoyment for any permitted use".[71] Permits have been denied by the tribunal where noise interfered with amenity,[72] and the tribunal has been required to implement one of those "relative, imprecise and flexible concepts giving rise, in the widely varying contexts and circumstances in which they have to be applied, to many difficulties of application".[73] At the same time, the tribunal has decided not to consider the economic plight of the applicant if the permit is refused.[74] Secondly, as town planning has been established to deal with the collective effects of such activities as traffic, rather than their impact on any one individual, the threat to the amenity of an area for the visitor and the passer-by, as well as the resident, may be considered.[75] Furthermore, while the permit system focuses on the use by the applicant of land in the scheme's area, the activities of the people attracted by the use, such as customers to a drive-in fast food shop, may also be taken into account.[76]

Even so, the scope of the tribunal's enquiry might easily be exaggerated. The large developments at stake in some appeals, and the presence of lawyers, have contributed to an adversary atmosphere, with cross-examination and points of procedure against expert witnesses seeking to convey their opinions on aesthetic and like matters which, in the nature, lack precision. The claim of the applicant for the permit is very real, while the interests of the public, particularly those without a property interest such as tenants and workers in the area, are not well represented. In any case, even a decision to refuse a permit might only deflect the stream of cars into another area.

Perhaps in recognition that town planning issues are not readily justiciable, the Victorian Government amended the Act[77] to empower the Minister to transfer to the Executive Council the determination of any appeal that appeared to the Minister to raise a major issue of policy and to have a substantial effect on the achievement of planning objectives within Victoria. At the same time, decisions about road routing, street closures

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71 *Oakley and Ors* v *I. Clark and Son and Anr* [1967] N.Z.L.R. 353, 355 quoting from Perry, J. in *Wilson Rothery Ltd.* v *Mount Wellington Borough* [1966] N.Z.L.R. 371, 377.

72 *Crane & Williams Pty. Ltd.* v *Hornsby Shire Council* (1966) 12 L.G.R.A. 3967, 406.

73 *Mitchell* v *Sydney County Council* (1956) 2 L.G.R.A. 152, 157.

74 *Stocks & Holdings (Constructors) Pty. Ltd.* v *Waverley Municipal Council* (1971) 23 L.G.R.A. 264, 269.

75 *Vacuum Oil Company Pty. Ltd.* v *Ashfield Municipal Council* (1956) 2 L.G.R.A. 8, 11.

76 *Big Boy Drive-In Restaurant Pty. Ltd.* v *Marrickville Municipal Council* (1968) 15 L.G.R.A. 324, 326.

77 Town and Country Planning Act 1961 (Vic.).

and other measures against through-traffic, have remained the domain of administrative authorities such as the Country Roads Board.

To sum up, that part of planning which can be characterized as a quasi-judicial process, the permit system, employs criteria sufficiently broad and orders sufficiently flexible to respond to many of the varying noise impacts. It remains, however, unsuitable to strike at the source of much of the noise – the changing and anonymous passing traffic.

(d) Mandatory Legislative Standards

Legislative restrictions on the permissible sound level of vehicles are the most modern response to the traffic noise question. In Victoria, by way of example, such regulation has developed piece-meal: until 1976, the main source of regulation was part of the general design and operation specifications of the roadworthiness requirements. In 1976, the Environment Protection (Motor Car Noise) Regulations were enacted.

Calabresi and Melamed recognize that a "rule of inalienability" is justified if the sale of an entitlement has significant and widespread external costs, especially those costs which cannot be measured in an objective and non-arbitrary way.[78] Where the pattern and content of consumption has an impact on the conditions of others, maybe groups worse off, then the transactions might be regulated by, for example, prescribing preconditions for a valid sale or forbidding a sale altogether. Indeed, paternatistically, sales might even be regulated for what society sees as good for those who enter into them.

If the need for such rules is recognized, care should still be exercised in their use. If rules of inalienability are to be used to limit the level of pollution or to control the activities which cause pollution, adequate research must be done, prior to their formulation and during their operation, to determine that the strictures are effective and that their benefits outweigh any side-effects. Technical and political judgements must therefore be made. Certain dangers are inherent in this form of rule, but the considerable range in content that may be adopted provides a safeguard. Furthermore, the legislative rule can be complemented by other forms of regulation. In this vein, it is important to consider the level at which the permissable sound emission is struck, the ease with which it can be altered, and whether, at any one time, the level is universal, strict and specific.

The Motor Car Regulations 1966 (hereinafter referred to as MCR), require that a car be constructed, maintained, loaded and driven in a manner which avoids undue noise, and, specifically, that a silencing device be fitted to the engine so that undue noise is suppressed.[79] The Regulations do not identify explicitly the person on whom these obligations are imposed, but together with the requirement of Australian Design Rule 28A (hereinafter referred to as ADR)[80] which is incorporated in the Regulations,[81] the obligations are formally assigned to the person seeking registration and to subsequent owners and drivers. In addition, section 83(1) of the Motor Car Act 1958 (Vic.) makes the owner and driver liable to an offence where their motor car emits on the highway an offensive noise of such a quantity or extent to be an annoyance or danger to the public. In contrast, the Environment Protection (Motor Car Noise) Regulations (hereinafter referred to as EPR) specify that vehicles must not emit noise above a sound pressure level fixed accord-

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78 G. Calabresi and A. Melamed, Note 40 *supra*, 1111.
79 Motor Car Regulations 1966 (Vic.) regs. 141 and 152. See also *Philpott* v *Ministry of Transport* [1972] N.Z.L.R. 518.
80 The Australian Design Rules are issued by Transport Australia.
81 Motor Car Regulations 1966 (Vic.), regs. 139AF and 139AO.

ing to the class of vehicles: in respect of passenger cars, the level is 96dB(A).[82] The Regulations are made pursuant to Part VIII of the Environment Protection Act 1970 (Vic.). The Act prohibits objectionable and intolerable noise while the level which represents this noise is set by the Regulations. In particular, Section 48B of the Act makes the owner liable to an offence if his motor car is used on the highway when it is capable of emitting a noise in excess of the level fixed by the Regulations. The Regulations also make it an offence for any person to remove or to render ineffective noise reducing fittings or to drive a car so modified.[83]

The measure of permissible noise in the MCR is subjective and flexible. The police, who administer the standard, are not supplied with a definition of undue noise, at least not in the text of these regulations, or a procedure by which to test for it. Instead, they are likely to apply their own personal standards or those they perceive to be the standards of their constituency. While a relative standard, incorporating a requirement of balance. they can allow for the variations in circumstance that accompany the emission of sound, However, at the same time, apart from the ADR requirement for new vehicles, a maximum permissible level is not spelled out and the owner is given no assurance of legality. In some areas, the actual level of noise will develop as a matter of practice among those who service and run the cars, according to their estimation of what escapes detection and prosecution. The pattern of enforcement thus becomes crucial.

The sound pressure level of the EPR is precise and is in a sense objective. It provides certainty but, at the same time, the level is inflexible and arbitrary. The present level is 96dB(A), which is tested for under the following conditions. The Regulations state that the site for testing a car's noise must be in the open air and there must be a free space of at least 3,000 millimetres on each side of the car. Furthermore, the car should not be tested unless the background noise is at least 10dB(A) below that of the car. It should neither be tested if there is rain, sleet or snow. The microphone should be about 525 millimetres from the exhaust pipe opening. The car should be operated at three quarters its engine speed at maximum power (rpm): where the speed at maximum power cannot be obtained, it is deemed to be 3,000 revolutions per minute. Finally, the car must be stabilized at that speed for a sufficiently long period for the measure to be made.[84]

The procedure thereby attempts to standardize the conditions in which impermissible noise emerges. Yet book standards such as these must achieve precision at some neglect of subtleties and varieties in the character, context and impact of noise. The level of 96dB(A) is well above the median threshhold level of annoyance and a level at which prolonged or repeated exposure impairs hearing capacity. The level may be set rather high to allow (impart) for those situations in which the impact of the car's noise is reduced by other environmental factors such as physical barriers and screens or by the listener's own noisy activities. On the other hand, the impact of noise can increase with the number of cars operating together at this level[85] and with the duration and the time of day of any one emission. The sound level of one close car, especially at night, can intrude as much as the steady noise of a flow of traffic. Thus, when the context of the emission is varied with the sound level of the individual vehicle, a standard might favour either the noisy vehicle, or, sometimes, the very sensitive listener.

In fact, the EPR standard had little impact on the character of new vehicles. A

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82 Environment Protection (Motor Car Noise) Regulations 1976 (Vic.), regulation 3 and Schedule 1.

83 *Id.*, regs. 5 and 6.

84 *Id.*, Schedule 2.

85 Note 4 *supra*, 119.

"small safety margin" between the EPR standard for in-service vehicles and the ADR requirement for new vehicles was allowed to prevent the EPR becoming the de facto control on new vehicles.[86] Yet as the original ADR was set at 85dB(A) and the later one at 81dB(A), a considerable margin eventuated. It seems that the EPR was aimed only at those in-service vehicles which were specially modified or very poorly maintained.

The steps that led to the enactment of the standard might cast light on its purposes, although the evidence is thin. In the second reading speech to the Environment Protection (Noise Control) Amendment Bill 1975 (Vic.), the Minister for Conservation pointed out that noise control provisions had previously been scattered through a variety of different acts which, with few exceptions, had attempted to deal with noise on a subjective basis.[87] The new provisions were not to supersede existing provisions but rather to supplement them in the light of the increased expertise in the field of acoustics and noise control now available to the Government through the Environment Protection Authority. The Government was now to respond to the subjective, transient nature of noise with a mandatory, uniform noise limit.[88] All the same, the Minister made no argument that noise intrusion was increasing. Even in 1970, in the second reading speech to the principal Act, while recognizing that a rapidly increasing volume of waste was being discharged into the air and waters, he made no mention of the extent of the noise problem.[89] In 1975, the Opposition's reply was in a similar vein.[90] The Opposition was more concerned that the Government had not acted on noise at work. Its spokesman argued that the Government was, instead, intent on the pursuit of "the little man in the private situation of his home".[91] (The Bill enabled the regulation of domestic noise also). The police already had power under the MCR to act against noisy cars and these regulations had worked effectively.[92] Moreover, the Opposition contended, the new offences were too strict. "If the average modern car which is capable of travelling at 110 m.p.h. – not that people drive at that speed – was tested by a person putting his foot down on the accelerator, it would be found that the vehicle was capable of emitting noise", its spokesman contended.[93] Finally, if such a standard was to be required of anyone, it ought to be the manufacturer rather than the buyer: if it is reasonable for someone to sell such cars, it is reasonable, in our society, for someone to buy them.[94]

The Government had, at least ostensibly, implemented a "quality of life" policy which was to affect both some sections of the industry and the users of vehicles. On the evidence, there was no ground-swell of public opinion on the issue at the time of the legislative action. Neither was there much consideration given to it by the press.

The recently formed Environment Protection Authority (herinafter referred to as EPA) had generated material itself for the consideration of the Government. The EPA had before them the overseas studies which showed that traffic noise over 68dB(A) was at least a source of annoyance among city dwellers. The literature about techniques of noise control had also expanded considerably in the late 1960's and early 1970's. The

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86 R. Law, "Motor Vehicle Noise Legislation in Australia Current and Pending" (Paper for a seminar on Noise and Vibration Control arranged by The Society of Automotive Engineers, Australasia, Melbourne, 1978). Mr. Law is Principal Noise Control Officer of the Victorian Environment Protection Authority.

87 Vic. Parl. Deb. 1975, Vol. 322, 5358, 5359.

88 *Id.*, 5358, 5359-60.

89 Vic. Parl. Deb. 1970, Vol. 300, 1816.

90 Note 87 *supra*, 6355.

91 *Id.*, 6358.

92 *Id.*, 6360.

93 *Ibid.*

94 *Ibid.*

EPA undertook a study of noise in the municipality of Richmond, an inner suburb of Melbourne, in which, with the aid of the University of Melbourne, the relationship between noise and welfare was considered, without, according to the EPA, much success.[95] Subsequently, the EPA carried out a random survey of the noise level of vehicles on the road involving more than 1,200 passenger cars.[96] Finally, in formulating a recommendation for enactment, it accepted submissions from outsiders but did not place advertisements or hold public hearings to attract opinions. However, it did "float" the possible levels with "industry and user bodies for comment".[97]

The regulations embodying the actual standard were made by the Governor-in-Council after submission to the Cabinet. They lay before both Houses of Parliament for 14 days before becoming law. How many cars was the level to affect? To answer this, it is necessary first to consider the ADR. So that new vehicles comply with the ADR, vehicle manufacturers may submit design rule test data to the Federal Department of Transport (now Transport Australia), the Department thereafter making a recommendation to the Australian Motor Vehicle Certification Board which, in turn, may issue compliance plates to the manufacturer for the particular model. Where this procedure is followed, the state registration authority has an indication that a vehicle should comply with the ADR and hence with the roadworthiness requirements of the MCR. The procedure is, however, for the certification of models, and not individual vehicles, and is, in any case, voluntary. Both a review of the development and administration of the ADR,[98] and the EPA,[99] have recognized that some new vehicles slip through the net. It follows inferentially from the MCR that the ADR requirements should also be met on re-registration. In Victoria, a fresh roadworthiness certificate is only required on a transfer of the vehicle and, as the certificate can be obtained from some private garages, it is most unlikely, as a matter of practice, that the sound level is assessed strictly.

The margin between the EPR and ADR 28A is a considerable 15dB(A). After the road survey in 1975, the EPA estimated that 0.13% of pre-ADR 28 standard (that is, unmodified) vehicles would fail the EPR in-service requirement.[100] Moreover, with deterioration through wear and tear, especially in exhaust systems,[101] an unknown quantity of post – ADR 28 and 28A standard cars will develop levels between 85 or 81, and 96dB(A). Given that, very roughly, an increase of 10dB(A)[102] doubles the loudness of a sound, a lee-way of 15dB(A) seems unduly generous. In any case, it cannot be assumed that a level of 81dB(A) is a perfect standard for new vehicles in Victoria.

The ADR standard is set nationally by the Australian Transport Advisory Council and incorporated into local regulations by each of the States. Adherence by the States to the ADR promotes universality throughout Australia but noise problems vary, with levels of congestion in particular, from state to state, as they do from country to country. So too do capacity to pay, the importance of the vehicle industry, technological capability, and the like. Uniformity throughout Australia, and compatibility with requirements in markets overseas, are, however, important to the industry. The Australian rule-makers have looked to the standards developed by the Economic Commission for Europe and by the U.S.A. Federal Motor Vehicle Safety Standards (ADR 28 was based on an ECE regu-

95 Interview with the Principal Noise Control Officer in 1980.
96 Environment Protection Authority (Vic.), *Annual Report 1975-1976* (1976) 17.
97 Note 86 *supra*, 6.
98 Note 29 *supra*, 41.
99 Note 86 *supra*, 2.
100 *Id.*, 7.
101 Note 4 *supra*, 119.
102 *Id.*, 104.

lation).[103] Both the Japanese and American standards must be especially important to Australia and, currently, they stand at 70/82 (steady/accelerated running) and 86/90 (under/over 35 m.p.h.) respectively.[104]

It is perhaps significant that the Australian Transport Advisory Council comprises the transport ministers of each government. It is supported by a Motor Transport Group of senior officials from the government transport authorities, and served by a rule-making committee on vehicle noise made up of manufacturing industry representatives, technical officers from transport and environment authorities, car club staff, and engineering academics.[105]

To return to the EPR, after the road survey in 1975, the EPA estimated that 15% of non-standard or faulty vehicles would fail to comply with a 96dB(A) maximum so that, in total, about 2% of the total car population would be in excess.[106] In the paper prepared in 1978, the EPA's Principal Noise Control Officer conceded that the sound level was influenced by "political considerations as to what percentage of the passenger car population to fail would be acceptable".[107] At the level struck, the only group really affected are modified and faulty vehicles. It is notable that the tabling of the 1976 level raised no comment from the Labor Opposition.

In addition, the practices and powers of the enforcement agencies play a major part in determining the strength of a standard. The real impact of a regulation is influenced by, among other factors, the manpower of the agency, the actions available to it and its attitudes to offences and the various classes of offender.[108]

The police, and specifically the traffic control branch, administer the provision of the Motor Car Act and the MCR. A vehicle should, of course, be roadworthy on registration, both new and on a transfer of ownership. Once registered and on the road, cars that are unroadworthy in respect of noise, must be detected and pursued by the mobile police, who may fine "on the spot" and order the vehicles off the road.[109] Proceeding instead under section 83(1) of the Act,[110] for example, when the vehicle emits undue noise "in the manner driven" without being unroadworthy, a summons to court must be

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103 Note 29 *supra*, 122.

104 The standards overseas, both for new and in-service vehicles, have varied somewhat. Today, most European countries incorporate the European Economic Community's level, presently 80dB(A): Council Directive 77/212/EEC. The recommendation of the Economic Commission for Europe (a United Nations body) now stands at 83dB(A). In the United States, the coverage of the federal standard (largely of the Environment Protection Authority's making) is limited, for constitutional reasons to interstate carriers and the like. The matter has largely been a state concern, with a few states, notably California and Illinois, leading the way: see J. Hildebrand, "Noise Pollution: An Introduction to the Problem and an Outline for Future Legal Research" (1970) 70 *Colum L. Rev.* 652, 676. It is fair to say that Australia's standard for new vehicles has virtually reached the strictest relevant overseas standards, but that the local in-service requirement is still easier. Britain's in-service requirement, for example, is 87dB(A). Generally, other countries allow a smaller margin between the level for new and in-service vehicles. The figures cited here were obtained from InterEurope Regulations Ltd., *International Automotive Regulations* (a looseleaf service compiled in England).

105 Note 29 *supra*, 110.

106 Note 86 *supra*, 7.

107 *Ibid.*

108 See generally, W. Carson, "Some Sociological Aspects of Strict Liability and the Enforcement of Factory Legislation" (1970) 33 *Mod. L. Rev.* 396. Notes on government studies of the experience of enforcement of noise levels in the United States can be found in note 22 *supra*, See also, note 26 *supra*, 69. The reactions of the subjects of the legislation, as well as its administrators, are, of course, relevant. See E. Beerworth, "The Evaluation of Legislation" in R. Tomasic (ed.), *Legislation and Society in Australia* (1979), 66.

109 Motor Car Act 1958 (Vic.) s.21K.

110 Motor Car Act 1958 (Vic.).

issued. A car may be maintained in top performance condition by an enthusiast yet be capable of making loud noises.

It was suggested to me by a senior police officer that the mobile police might prefer to avoid appearances in court because of the time they consume.[111] "On the spot" fines for unroadworthiness might therefore be preferred, summonses confined to more gross violations, for example, where the "young bucks make a noise that can be heard three or four blocks away",[112] and, latterly, much of the action against noisy vehicles, has been left up to the EPA. The police have, on occasions, sent vehicles to the EPA testing stations. The figures published by the Victorian Police[113] do not reveal the incidence of enforcement, nor, it follows, any pattern in the localities, times of day or types of driver that are concerned. In 1978, 1470 instances of unroadworthiness of all kinds were penalized.[114] The number of prosecutions for undue noise under section 83(1) (and Regulation 152)[115] is submerged in the figures for conviction of "other offences". In opposition to the second reading speech for the 1975 amendment to the Environment Protection Act, the Labor spokesman suggested that "[e]ach year, approximately 2,000 people are brought before the courts for driving noisy motor vehicles", but unfortunately that figure was not sourced.[116]

When an EPA road patrol detects a vehicle that it suspects exceeds the EPR level it notes its number. The EPA then sends the owner a notice requiring him to present it for testing within 14 days (provided it is garaged within 50 kilometres of the testing station). At present, the EPA operates one permanent station at Altona and one mobile station in the eastern and southern suburbs. It is the EPA's intent that the owners thus have the opportunity to remedy the deficiency in the vehicle before it is presented. Indeed, the EPA's annual reports reveal that owners whose vehicles fail the first test "by a small margin", are allowed to return for a re-test before a prosecution is contemplated. According to the EPA,[117] through to mid-1979, owners whose vehicles exceeded the level were prosecuted at a rate of one per cent. For failure to meet the standard, the magistrates' court may impose a fine to the maximum of $400.[118] A fine of $400, or $100 a day for a continuing offence, may also be imposed for a breach of the EPR by rendering ineffective noise-reducing equipment or driving a vehicle so rendered.[119]

The EPA does not have the power to order vehicles that fail to meet the standard off the road. Owners who fail to present their vehicle for testing may be prosecuted and are liable for a fine up to $200.[120] Its Principal Noise Control Officer estimated that the EPA has the capacity to test 4,000 vehicles a year.[121] At 31st December, 1978, there were 1,724,399 registered passenger cars in Victoria[122] and, if the EPA's original estimate was correct, 34,488 of these fail to meet the standard. In 1979-1980[123] three years after the EPR were enacted, 1,485 cars were tested. Of these, 170 were found to exceed

111 Interview in 1980. Regrettably, but explicably, the officer made the remarks anonymously. See also, note 27 *supra*, 113.
112 *Ibid.*
113 Victoria Police (Vic.), *Annual Report 1978* (1978).
114 *Id.*, 37.
115 *Id.*, 36.
116 Note 87 *supra*, 6355, 6358.
117 Environment Protection Authority (Vic.), *Annual Report 1978-1979* (1979) 21.
118 Environment Protection Act 1970 (Vic.) s.48B.
119 Environment Protection (Motor Car Noise) Regulations 1976 (Vic.) reg. 8.
120 The source of this power is not clear to the writer.
121 Note 86 *supra*, 10.
122 State of Victoria, *Victorian Year Book 1980* (1980) 544.
123 Environment Protection Authority (Vic.), *Annual Report 1979-1980* (1980) 14.

the level, a rate of twelve per cent, and 151 of this 170 were then allowed to re-test. There were 515 which were not presented for testing but there were only 25 prosecutions for all offences. Furthermore, due to its limited resources, a bias has developed in the EPA's coverage, with patrols concentrating on such "high yield areas" as around garages in the western suburbs. As a result the pursuit of noisy vehicles at night, on weekends, and in the country, has been left largely to the police through the MCR. On the EPA's own estimates, it will take fifty years to detect all cars in excess of the standard, assuming none of these revert after testing and there is no increase in the proportion.

3 CONCLUSIONS

Several explanations of the enactment of noise level legislation in 1976 can be offered. In considering these explanations, it is useful to begin with a presumption that the vehicle and allied industries would be opposed to any control that affected its economic interests be either increasing the cost of production of standard models or by proscribing the use of certain specialist vehicles. Philosophically, a conservative government such as the Victorian Liberal Government would be sensitive to the objections of these industries. In more practical terms, these industries comprise one of the largest capital and employment sectors in the state and in the nation. Any government is sensitive to complaints of unilateral and uneconomic restrictions at a time when capital is being rationalized internationally and production is being relocated. In a recession, when jobs and local dividends are threatened, environmental controls are re-considered, as the drawback on vehicle exhaust emission standards indicates. Besides, apart from any critical point in the development of the industry, the car represents the modern embodiment of commodity relations and private consumption in the social sphere as well as a key element in the conduct of trade and commerce. The Victorian Government's shaky performance in mass public transport suggests its sympathies lie with the car.

If this presumption is applied faithfully, it must be concluded either that the legislation was not to prejudice the interests of these industries or that other interests were on this occasion able to assert themselves. If the legislation had little impact on the industries, then the government's motives for legislating are more obscure. A consistent interpretation is that the legislation was to give the appearance of action in relation to the clash between noisy vehicles and quiet surroundings. The legislation had an ideological function:[124] the appearance of action and even a mild concession was required to pre-empt any serious challenges to the continuing dissemination of the motor vehicle. More radical demands, supported by direct action, might otherwise have developed. Such opposition only develops, however, with an awareness of the problem and its solutions.

A role can therefore be ascribed in this interpretation to any fact which demonstrates that noise was increasing in volume and distribution or that attitudes were changing so that people were more sensitive to noise and placed a higher value on peace and quiet.

Yet there is no evidence of a ground-swell of public opinion at the time. Nor did those unions which could possibly influence the quality of vehicle performance seem to be concerned about noise levels. The little real action on the traffic issue originated in a few middle-class resident and environment groups. Nonetheless, if the function of the legislation is to keep more challenging demands off the public agenda,[125] a belief that an energetic campaign, with some popular appeal, might eventually develop, would be suf-

124 M. Cain, "The Main Themes of Marx' and Engels' Sociology of Law" (1974) 1 *British Journal of Law and Society* 136, 142.

125 R. Tomasic, "The Sociology of Legislation" in Tomasic, note 108 *supra,* 39-40.

ficient. In this case, the enactment of a standard serves to pre-empt and neutralize an issue. In Livock's opinion, advanced in his study of the regulation of industrial hazards, it is as much the characterization of the matter in scientific as in legal terms that obscures the choice between interests taking place.[126] The notion, thus, of a precise sound level, "objectively" fixed and tested, removes the matter from political and economic contest. The level is frozen and the legislature adds its imprimateur to a degree of instrusion. In particular, the sound level regulation might lead to a decline in the enforcement of nuisance and excessive noise rules which, although erratic, are more sensitive to variations in circumstances of noise intrusion.[127] Generally, the enactment helps to defuse the conflict around the use of the private vehicle, for it is not so much that radical demands over car noise can be expected but that resistance to the frequency, purpose and location of use may develop. By concentrating on the performance of the individual vehicle, and in directing the responsibilities to the owner and driver, the regulation serves to atomize the problem.[128] On the contrary, a more vital strategy would address the design and manufacture of models and the quality of alternative public modes of transport.

In reply to this thesis, when the 1976 EPR is combined with the ADR, it can be argued that there has been a real impact on the level of vehicle and traffic noise. On first impression, this finding seems inconsistent with a theory that law is the instrument of the systematically prevailing economic group.[129] In this vein, the trend in the late 1960's and 1970's to revalue the "quality of life" should be placed in perspective. With rising, and to some extent spreading, affluence, a greater marginal value could be given to amenity and the pursuit of the aesthetic and effete over the material and mechanical. A section of the middle-class had absorbed some of the less challenging sentiments of the counter-culture movement. A little of this trend filtered through to the Liberal Party, which, led by the then new Premier, Hamer, introduced a "quality of life" element into its platform in an effort to rejuvenate the image of the government after seventeen years in office under the earthy leader, Bolte. Perhaps, this affluent and educated "new class" provided some counterbalance to the traditional business and industry interests that might be opposed to a standard.

The motives of this new group might be seen as economic and self-centred. Property values, especially in the inner suburbs where some of the group had been moving, were threatened by traffic noise. On the other hand, employed in modern professional and government occupations, the group did not depend on the success of the industries affected. Nevertheless, it might be permissible in this case to move away from economic interpretations and attribute to the impetus for a standard the assertion of cultural and moralistic sentiments and the affirmation of aesthetic and qualitative values over the brute material and mechanical. Of course, such assertions provide their opponents with kudos and satisfaction, but one might still detect a genuine concern for the welfare of others less influential and articulate, encouraged by the advances of knowledge of the connection between noise and well-being and of the effective techniques of control. To the professionals, some within the government authorities concerned, a universal standard in legislative form would have appealed to their rationalizing and engineering inclinations.

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126 R. Livock, "Science, Law and Safety Standards: A Case Study of Industrial Disease" (1976) 6 *British Journal of Law and Society* 172.

127 The writer was unable to obtain recent figures that might indicate this.

128 B. Fine, "Law and Class" in B. Fine et. al. (eds.), *Capitalism and the Rule of Law"* (1979) 29.

129 R. Quinney, *The Social Reality of Crime"* (1970) *Cf.* P. O'Malley, "Theories of Structure Versus Casual Determination: Accounting for Legislative Change in Capitalist Societies" in Tomasic, note 108 *supra,* 51.

It would be dangerous, however, to isolate the role of any liberal technocratic elite from its social and economic context or to exaggerate its coherence and influence. If such an elite did have a victory of sorts, it might be safest to suggest that victory was symbolic rather than instrumental, as Carson might do.[130] Thus, the legislation was not really expected to have a significant impact and certainly the estimate that it will take around fifty years to detect as many cars as presently exceed the level, seems to support this contention.

Alternatively, those actually distributed by the regulation were groups with little power. At the level struck, the hardest hit were young working-class male enthusiasts who modify their cars and owners who cannot afford to maintain and repair their vehicles as they deteriorate. The major manufacturers, with new technology, the swing to smaller vehicles and the standards already introduced overseas, were ready to satisfy the requirements for new standard cars. Only the specialist makers and the garages who modify vehicles might be hurt. Any increase in the cost of the ordinary models might be passed onto the consumers who are numerous but poorly organized. Here it is interesting to note that the standards[131] for trucks were allowed a much longer introduction period so that users could adjust.

Yet, if the victory seems hollow, the car is still a great instrument of pleasure and convenience to many members of the public. Such drivers are complicit in the infliction of noise by force of the cars they buy, the extras they fit and the places they drive. It is a measure of the sophistication and the strength of our social mechanisms that some action can be taken on a technology as persuasive and central as the car.[132]

Theoretically, improvements can still be made in the legal response to this complex issue. The variables today are largely values and interests; techniques of measurement of the level of noise and of the impact on individuals have advanced considerably. Ways of reducing vehicle noise at its source are also known. With the right incentives and directives, techniques of reduction should continue to develop. The capital cost of a reduction in emission levels already are not so great: one estimate in 1974 put a reduction of 10dB (A) at no more than five per cent of a car's construction cost.[133]

Rather, the benefits of quiet to the individual and to the community continue to lack full valuation and promotion. The common sound level standard struck in 1976 represents a rough starting point. To admit any exception to it, or allow any variation, would undermine its operation and yet, at present, it seems insufficiently sophisticated and forceful. If, on the one hand, the present level favours the sensitive listener (which is unlikely), then, perhaps, the strategy might be made more subtle by paying compensation to manufacturers and owners from taxation funds.[134] The industry already receives subsidies in various guises. Needless to say, the calculation and the apportionment of the contributions would prove controversial.

If, on the other hand, the present level favours the manufacturer and owners, it should be reducible. As it can be very difficult to obtain alterations to legislation to meet changes in circumstances, the standard may freeze at a certain point, becoming the effective level rather than the maximum. A tax that reduces with the noise of a vehicle would provide an inducement for drivers to seek quieter models, provided they are price-sen-

130 W.G. Carson, "Symbolic and Instrumental Dimensions of Early Factory Legislation" in R. Hood (ed.), *Crime, Criminology and Public Policy* (1974), 107.

131 Environment Protection (Truck, Omnibus and Motor Cycle Noise) Regulations 1978 (Vic.).

132 *Cf.* note 125 *supra*, 42.

133 A Hitchcock, "Traffic Noise" in P. Townroe (ed.), *Social and Political Consequences of the Motor Car* (1974) 78.

134 Note 40 *supra*, 1116.

sitive and the tax is adequate to outweigh the costs of reduction in noise. In his advocacy of such a charge, Alexandre notes that variations between drivers in the amount of noise actually emitted and in the conditions of that emission, and between manufacturers in the costs of reduction, also make a tax less apt.[135] He suggests that a system of charges supplement, rather than replace, a minimum universal standard.[136]

Accordingly, it would remain important to ensure that the compulsory maximum was significant. To ensure that this standard is adjusted in the light of changes in technology and values, procedures are required whereby the expert agencies regularly re-examine conditions, and the groups affected, including the listeners, are consulted and surveyed and perhaps allowed direct representation in the reviews.[137] To this end, the status, content and procedure of these reviews need to be considerably strengthened and placed, perhaps, on a legal basis.[138] A precedent for this is afforded by the incorporation of the representatives of the vehicle industry in the formulation of the ADR.[139]

135 A. Alexandre and J.-Ph. Barde, "Regulatory and Economic Instruments for Traffic Noise Control" in Alexandre et. al, note 15 *supra*, 198.

136 *Id.*, 200.

137 K. Nichols, "Public Participation in Decision-making Related to Science and Technology", *Organization for Economic Co-operation and Development, Technology on Trial* (1979).

138 C. Arup, "Accounting for the Social Impacts of Technology Through the Legal Process" (Paper for the Law and Economics Workshop, Research School of Social Sciences, Australian National University, 1980).

139 Note 29 *supra*, 122.