

## **The Third Runway, and Worries in Nedlands: A Crisis for Economic Modelling?**

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### **Abstract:**

Last year brought important criticisms of the use of rational model-building: from staff-members of the WA Department of Transport, two laments which may be construed as being about how hard it is to embody public preferences in transport policy; and from a firm of consultants, a denunciation of the use of cost-benefit analysis, at least in complex situations such as that of the third runway at Sydney airport.

This paper argues that, on the contrary, rational economic modelling is essential for successful handling of the problems to which the critics refer. In particular, such modelling helps in addressing distributional consequences, that is, who gains and who loses, and by how much. The paper concludes with some 'modest' suggestions on how to attend to the interests of the losers.

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## Introduction

Just as 1991 was a bad year for the economy, so was it a troubled year for at least some transport professionals. And like the economic depression, the professional malaise spanned the full distance, from East to West. At Botany, a firm of consultants forthrightly rejected rational economic modelling, in the form of cost-benefit analysis, arguing that it is inapplicable in complex policy circumstances. And in Nedlands, there arose a *cri du coeur* (or, strictly, two of them) which may be interpreted as being about the problems for expert opinion/rational modelling in representing effectively the preferences of the people.

This paper addresses these criticisms and doubts, argues that the positions adopted last year do not give proper recognition to our intellectual inheritance and to its value in policy-making, and acknowledges that, nevertheless, there is often very great difficulty in identifying a 'good' policy when - as is commonly the case - different groups in society have differing interests and preferences. The paper concludes with some modest suggestions for the achievement of an effective marriage of professional analysis and the will of the people. In addressing these tasks, it is convenient to begin in the East.

## Barbarism in Botany?

The occasion of the attack on cost-benefit analysis was an environmental impact statement (EIS), prepared by a firm of consultants engaged by the Federal Airports Corporation, and relating to the proposed development and use of a third runway at Sydney Airport. By virtue of the (Commonwealth) *Environment Protection (Impact of Proposals) Act 1974*, preparation of such a statement is required before the Commonwealth government may sanction construction of the runway.

In the draft EIS published in 1990, the consultants evaluate physical alternatives by reference to three separate criteria:

- runway capacity (specifically, is there sufficient capacity to accommodate the forecast traffic levels without incurring runway utilisation delays that exceed an arbitrarily-chosen level?)
- the number of people 'seriously' affected by aircraft noise
- the present value of the cost of construction of runways and related infrastructure.

Besides these numerical attributes, there is also qualitative consideration given to 'other implications' such as timing, and the impact on the various sectors of the aviation industry. (For details of the scheme of evaluation, see Kinhill, 1990, Summary pp. xxv to xxvii, and Chapter 7, especially pp. 7-9 to 7-22.)

The design of the scheme of evaluation allows only a limited role for economic analysis. In particular, the scheme does not have the integration that should come with full economic modelling:

- the aircraft movement forecasts are not based on explicit runway pricing strategies

- the acceptable level of runway delays is specified in physical terms (after looking at practice elsewhere), rather than being determined endogenously within an economic calculation that measures the trade-off between delay cost and construction cost
- the element of noise disturbance is represented by the number of persons suffering noise at or above a certain physical level, there is no attempt to value this in dollar terms, and the chosen numerical measure ignores the effect on people exposed to a noise level below the arbitrarily-chosen level, which seems to be quite high
- there is no quantification, in the overall evaluation, of other capital and all operating costs (and this is in contrast to the MANS - Major Airport Needs of Sydney - study undertaken in the late 1970s - see Mills, 1982)
- *a fortiori*, there is no cost-benefit analysis in which all the costs and benefits might be brought together in a systematic way, in an attempt to see which of the physical alternatives scores best *according to a comprehensive measure*.

Indeed, it seems that the term 'cost-benefit analysis' is not used in the report.

But such analysis is certainly discussed in the *supplementary EIS*, Kinhill (1991). At the end of 1990, interested parties were invited to comment on the draft report; much of the supplementary report is devoted to a response to these submissions. A group of objectors commissioned another firm of consultants to undertake a cost-benefit analysis, and it is in this context that the supplementary EIS explicitly rejects the use of cost-benefit analysis.

To support the argument on the inadequacy and failure of cost-benefit analysis, the supplementary EIS (p. 7-27) refers to three textbooks/manuals. From pp. 14-15 of Dasgupta and Pearce (1972), a passage of some eight lines is reproduced, including these 'punch' lines:

"To omit certain gains and losses is to fail to meet the all-encompassing definition of social costs and benefits. To include them is to stand charged with 'arbitrariness' or valuing that which cannot be valued"

Secondly, the EIS notes what it calls a 'criticism' - attributed to Pearce and Nash (1981), without a page reference given - to the effect that "economic evaluations in cost-benefit analysis [seem] to be out of step with political pressures and changing values" (Kinhill, 1991, p. 7-27). And thirdly, from a 1990 draft of a (Commonwealth) Department of Finance handbook, there are quotations that include

"Cost-benefit analysis is an area of economics where a number of issues remain less than fully resolved." "... to take account of intangible considerations and equity concerns, the analyst must in a sense go beyond the ordinary requirements of a cost-benefit analysis"

(In the published version, Dept. of Finance, 1991, these words appear on p. 84.)

The supplementary EIS concludes that "cost-benefit analysis has a number of shortcomings - particularly in relation to difficulties associated with applying economic evaluation to some items that are not readily quantifiable - that render it inappropriate as a framework for decision-making for the proposed third runway" (page xxii of the Overview)

Having dismissed cost-benefit analysis, the supplementary EIS goes on to say :  
"The shortcomings of cost-benefit analysis have led planners and social scientists to develop alternative decision-making methodologies. Two of these developments -

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'mixed scanning' and 'planning balance sheets' - were adopted as the approach in the Draft EIS. " (p.7-27)

(As it happens, these two terms - like the term 'cost-benefit analysis' - do not seem to be mentioned in the draft EIS. Is there a parallel with the man who had been speaking prose without knowing it?)

The mixed scanning strategy - attributed to Etzioni (1968) - is explained (supplementary EIS, 7-28) in terms of 'contextuating decisions' and 'item decisions'. This seems to amount to taking the big decisions by comparing skeletal alternatives, and then once a strategy alternative is chosen, take the remaining decisions by comparison of fully-specified alternatives within the now-restricted canvas.

The planning balance sheet approach is attributed to a town-planner (Lichfield, 1968) who "designed it to overcome two shortcomings of cost-benefit analysis by allowing for

- the inclusion of factors that cannot easily be quantified in monetary terms;
- the analysis of the distribution of impacts among different community groups" (supplementary EIS, 7-28).

## Assessment of these criticisms of rational economic modelling

In addressing the intrinsic arguments about the strengths and weaknesses of economic modelling such as cost-benefit analysis (CBA), it is helpful to begin by looking more closely at the views of Dasgupta, Pearce and Nash (all of whom are highly reputable economists) in order to put in context the apparently critical remarks that are quoted in the supplementary EIS.

The EIS remark about Pearce and Nash can refer only to pp. 10-11 of their book, where the authors draw a "distinction between the kind of 'one-man-one-vote' principle we are used to in democratic societies, and the kind of vote which actually gets recorded in a cost-benefit study". "The difference comes about because the use of money values permits some expression of the *intensity of preference*", "whereas in a political voting procedure.... [there is merely] a yes or no vote". Thus "CBA, in embodying the economic voting concept rather than the political voting concept, can provide extra information for the political process." (It is by no means obvious that Pearce and Nash are here criticising CBA as being out of touch with political realities, as the reader might believe the EIS to be claiming on p. 7-27, quoted previously.)

Turning now to Dasgupta and Pearce, those authors go on to say:

"But it remains true that the alternatives to CBA are just as vulnerable to charges of arbitrariness, indeed often more so. The town planner, for example, is frequently without any systematic criteria, save his own paternalistic preferences. Cost-benefit analysis does at least make the attempt to refer to individuals' preferences and to place them on a comparable basis for measurement." (p.15)

"In short, criticisms of cost-benefit analysis are only admissible if they can demonstrate that alternative prescriptive procedures are in some way superior." (p.16)

Thus the first claimed advantage for the planning balance sheet - that it can include items that are not quantifiable in monetary terms - is not a break-through. The substitution of the balance sheet for a cost-benefit analysis does not overcome the evaluation problem; and "the application of paternalistic preferences" serves as a (kindly!) description of the evaluation process used in the EIS.

Furthermore, the identification and physical description of a consequence that can not be given monetary evaluation can be made part of a cost-benefit analysis. (The idea is not new; it gets a brief mention on p. 21 of Dasgupta and Pearce, to quote a publication known to the authors of the EIS.) In this strategy, the economic modelling provides dollar evaluation wherever this can be done reasonably, and physical description for any remaining effects. The decision-maker is then able to compare the net dollar benefits (as measured) with the physical pros and cons of the remaining effects. As an example, consider noise nuisance from airport use: if it is thought that this can not be valued in dollar terms (and many economists dispute that pessimism - see the later discussion), and if all other consequences have been so valued, the decision-maker is then asked to judge whether a net benefit of (say) +\$700 million (in present value) outweighs the noise disturbance.

Of course, it is not an easy matter to judge. But is it unreasonable to suggest that the decision-maker is even more in the dark if the analysis provides no monetary evaluations at all (save for construction cost), as in the EIS planning balance sheet (Table 7.12 of draft EIS, Table 7.30 of supplementary EIS)?

On the second claim (that the balance sheet allows analysis of the distribution of impacts among different community groups), the response is similar: *this too can be done within a cost-benefit analysis*. The accounting framework to be used then has to identify separately each social group. All transactions have to be estimated - and this disaggregated approach can result in extra work, compared with the aggregated approach where transfer payments may be ignored, since they cancel out. The only significant difference is that while the aggregate approach gives a single figure for total net benefit (whenever all impacts can be valued in dollar terms), the disaggregated approach also gives the net benefit or cost for each group; the decision-maker is invited to consider the distributional consequences, and is given as much quantification as is feasible, to assist in weighing the interests of the parties. Such distributional considerations can be very important if some parties actually lose, while other parties gain. This circumstance raises questions about compensation, an issue that is discussed in the last section of this paper.

There is nothing new in this idea of disaggregation. There is a succinct and very clear exposition, by example, in Layard (1972), at pp. 13-16 of Layard's own introduction to CBA. Among the works quoted by the authors of the EIS, Pearce and Nash mention the idea on p. 34, where it is described as "an extension of Lichfield's planning balance sheet approach". Furthermore, by this 'display approach', the policy-maker's need to know about the distribution of gains and losses "can usually be addressed satisfactorily if the identity of the groups which gain and lose, and the sizes of the gains and losses, are carefully documented in the cost-benefit analysis" (section 7.2 of the published (1991) version of the Department of Finance manual).

Going beyond these specific details of technique in cost-benefit analysis, there are wider issues in the use of professional analysis in order to arrive at policies for the people. To assist in their consideration, it is now time to go West.

### Neuroses in Nedlands?

Although the Nedlands papers Stephens (1991) and Chambers and Ker (1991) are very different in style and argument, they have important common ground: both argue for the need to incorporate the preferences of users, or - better - of the public at large, in the professional analysis which precedes, or should precede, a policy decision on the provision of transport infrastructure or other transport services.

In her impassioned account, Stephens criticises transport planning, as traditionally practised:

"Masterplanning, with its emphasis on explicit quantified analysis, whether as econometrics, operations research or computer simulation, is rigorous, but is no match for complex situations, especially if these are combined with high conflict" (p.12)

In managerialism, "The assumption that objective setting leads to goal consensus is untested and possibly untenable in a conflict situation: its source is the so-called rational model of organisational behaviour in which the elite sets the goals and the workers follow them." (p.13)

Professional training "discourages more subjective and less empirical professional judgements so that .... issues such as the environment and social equity tend to be set aside." (p.19)

There seem to be two, related concerns: the need to deal with complexity, which may make measurement and analysis difficult, if not impossible; and the need to cope with conflict arising from the fact that different social groups often have different interests. These two concerns are addressed in later sections.

First, however, the term 'rational' needs consideration, especially because in recent times a misunderstanding or misrepresentation has gained wide currency: economic rationalism is portrayed as ruthless pursuit of dollars and more dollars, with no regard for equity between social groups, or for clean air or beautiful music. For some, the canard may be politically convenient.

But there is no historical basis for the usage. Rather, 'rational economic man' is one who has economic goals, and pursues them 'rationally' by choosing the means that most effectively achieve the end. (See Simon, 1957, and Simon, 1983, both quoted by Stephens; see also Elster, 1989, especially Chapter 3). There is no presumption that the goals do not include concern for the unemployed, nor the enjoyment of Picasso and unspoilt natural beauty. Incidentally, the sexist language in 'economic man' betrays the antiquity of the concept; there is no implication that the notion applies with any lesser or greater force to woman.

Thus the practice of 'rationality in the economic realm' and the use of a 'rational comprehensive model' (both from Stephens, p.18) do not imply - or should not imply - pre-selection of the ends or objectives. Furthermore, the neo-classical paradigm in economics - which is the fundamental thinking that underpins planning tools such as cost-benefit analysis - does not impose the goals of the elite upon the workers, nor does it countenance the adoption of town-planners' or any other paternalistic preferences. Rather it makes an "attempt to refer to individuals' preferences and to place them on a comparable basis for measurement" (Dasgupta and Pearce, p. 15, already quoted).

Consider two specific examples in transport. When some investment in infrastructure or vehicles would save time for travellers, the value of such savings is estimated (ideally) by reference to behaviour of the individuals concerned, observed in situations as closely comparable as can be found. If an individual who takes a taxi rather than a bus spends an extra \$5 in order to save 15 minutes of journey-time, then *for that individual*, the value of the time-saving flowing from the improvement to the bus service is at least \$20 per hour saved. For discussion of how such evidence may be used in cost-benefit analysis, see Harrison and Quarmby (1969) pp. 181-182 and Dasgupta and Pearce (1972) pp. 218-220.

A second example concerns the valuation of noise disturbance. Rather than merely asking people to nominate a dollar figure, the desirable practice is again to look at actual behaviour: when people buy and sell houses, or pay rent, they are putting money 'where their mouths are', by paying more for quiet locations and less for noisy ones. Such evidence can be collected and, in principle, applied to derive the relevant valuations. (See Flowerdew, 1972, pp. 437-442, and also Pearce and Nash, 1981, pp. 136-139 and the references therein).

Thus in the economist's approach to preferences, attention is paid to 'revealed preferences', as the jargon goes. In other words, valuations are based not on what people say they want but on what they are prepared to pay for; and (ideally, at least) the amount people are prepared to pay is judged by what people do pay in comparable situations. Thus what counts is not wants but 'effective demand'.

Chambers and Ker (1991) arrive at this position too, though without explicit reference to the received intellectual structure of neo-classical economic analysis. Chambers and Ker prefer the term 'expectations'; though they do equate that with effective demand (p. 4), they do not give a precise definition nor do they propose a process for measurement or even identification.

From the earlier discussion, it is apparent that the metric for the strength of individuals' preferences is dollars. Hence, aggregate effective demand is *dollar-denominated*. It seems that this in itself attracts the critics' hostility, perhaps for two reasons. First, it may not be always be understood that the measure should - and usually can - embrace any non-marketed commodities; the feasibility of such measurement is illustrated by the previous discussion of noise disturbance.

Second, someone who holds the view that the distribution of income (and wealth) among members of society is not the most desirable may realise that the distribution of effective demand is similarly affected. For example, someone who thinks the poor should be made better off may conclude that the poor have too few votes in the procedure that produces the measure of aggregate demand. (There is a parallel point if someone thinks the poor are too *well* off compared with the affluent.)

This kind of value-judgement may lead to advocacy of a project which scores poorly in aggregate cost-benefit terms, simply because the project favours the poor at the expense of the affluent (or otherwise shifts the distribution of income in the desired direction). The standard response of economists is to point out that this is invariably or usually not a cost-effective way of securing the shift in the distribution of income. Instead, the desired shift could be obtained with less loss of economic efficiency by changes in taxes and welfare or other transfer payments. Since the argument is an empirical one, careful measurement may be in order before judgement is passed on a project that secures a desired distributional effect at modest loss.

Perhaps there is also a need for education of voters - in the hope that increased knowledge and understanding will make them less tolerant of projects that have detrimental consequences for aggregate economic benefit, and more tolerant of direct redistribution through taxes and transfer payments. In the transport field, such education also may make voters less tolerant of grandiose schemes that further enrich the affluent

It is time to take stock of the overall argument. Economic modelling provides a basis for the assessment of peoples' preferences. It is a democratic basis, in the sense that it is based on valuations made by the people themselves, and not on the paternalistic preferences of the politician, town planner or traffic engineer.

Of course, the intellectual framework is not without its conceptual and empirical difficulties. The former have attracted critics aplenty, and the latter present many problems when the planner tries to operationalise the schema. Nevertheless, the point made so far is that there is an intellectual framework; if transport planners are unaware of it, or if they know of it but dismiss it, then in the absence of fortuitous coincidence of results, the planning recommendations will be inferior in one respect at least, viz. in the extent to which the recommendations represent the wishes of the public. The difficult conceptual and practical (institutional) problems encountered in the application of the analytical framework are considered in the following sections.

#### Some conceptual issues in aggregate cost-benefit analysis

For the present, suppose that the use of an aggregate cost-benefit measure is considered to be appropriate. (This leaves for later discussion the possible need for disaggregation, to see who gains and who loses, and by how much.)

Besides the difficulties in eliciting preferences and in measuring their intensity, there are conceptual worries about the calibre of the revealed preferences of individuals, and in particular whether such preferences give the 'right' criterion. This, of course, refers not to the dislike of the dictator for democracy, but to the very proper concerns of thinking citizens about how a democracy may best determine its targets. Without attempting a comprehensive, philosophical discussion, this section looks briefly at some of the immediate, operational issues.

An individual's preferences may be inadequately grounded in experience and comprehension. Chambers and Ker worry about this when they write (p.6): "Ignorance of the true situation, an inability to grasp the fundamental processes involved, and misunderstanding of consequences are but some of the problems [in the public consultation/submission process]."

As already indicated, part of the technique for handling this difficulty is to shun the approach in which people are asked to state what they want. Instead, whenever feasible, intensity of preferences is measured by observation of actual preferences that have been revealed by user (and other) actions taken in other situations that are at least approximately comparable. (And the same approach should be used in the related matter of estimation of behavioural parameters, such as the number of people who *will* use a new rail line - cf. Chambers and Ker, p.4) Only if the situation to be

evaluated has *significant* novelty will be it difficult to find comparable previous experience on which to base the estimates.

A brief remark in Chambers and Ker - "expectations change relatively rapidly ... as the general wealth, ethics, laws etc. of the community change" (p.5) - seems to point to at least two further conceptual difficulties. First, preferences may be unstable over time. Here it is useful to distinguish between two cases: changes in *external* factors, such as 'the general wealth'; and *internal* inconsistency over time, as when (for example) someone desires a second drink, leading immediately to consumption and a desire for a third, and later to a wish that consumption had ceased after the first. (For a discussion of such unintended consequences see Chapter X of Elster, 1989; the book as a whole may be recommended to those who are willing to risk another unintended consequence, viz. changes to their thinking that may result in policy impotence.) The practitioner's view on this should surely be pragmatic: be aware of the problem, try to avoid falling into traps, but do not shun the use of individuals' preferences.

The second difficulty arises from doubts about the use of individual preferences in settling matters that concern the community at large. All societies have taboos concerning individual behaviour (e.g. tobacco, heroin, rape). In some of these, society seeks to protect the individual from folly, out of concern for the individual and/or for the costs borne by society when that individual suffers the ill-effects. In others, the taboo is imposed to prevent damage to other individuals. While it is idle to pretend that society will accept that the entire taboo programme be shaped by cost-benefit analysis, it is fortunate that the issues that arise in transport planning (e.g. seat-belts, noise disturbance) are amenable to such analysis.

A further doubt arises when there are such complexities in the interactions between the components of the economic system under examination that it may be questioned whether the economic modelling can capture all the significant effects. (Perhaps this worry underlies some of the criticisms in the Nedlands papers.)

In the context of transport planning, it seems that the only projects that may present insuperable difficulties in respect of such complexity are those very large infrastructure projects that interact significantly with other land-use patterns, especially those of residential and production activities. Among these are transport infrastructure projects intended to serve basic functions such as journeys to work and shopping trips, and hence planned as part of an overall strategy to create a new urban form, or to adapt or extend an existing urban area. Among the policy issues in the bailiwick of our colleagues in Nedlands, there is one that may qualify here - the rail line to serve new urban areas to the north of Perth.

In such contexts, there are significant and widespread benefits of an indirect nature, resulting from complex functional relationships that convey impacts into non-transport fields. The evaluation problem becomes particularly acute if population growth results in increases in effective demand for basic transport services, increases that have to be accommodated, because the do-nothing alternative is not available. The difficulties (especially in forecasting) are compounded if a very long planning horizon is required, for example when a myopic view would lead to a low-capital-cost scheme that unravels later on in the face of increases in congestion and other operating costs.

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In such situations, there may be a case for accepting the project even if the costs outweigh the measured benefits. Conversely, there may be other cases of transport infrastructure where the benefits are relatively easily measured, but where significant negative externalities have diffuse but major impacts on other land-uses. (Does this describe airport infrastructure? Reflect on how the third runway in Sydney is in conflict with other government plans for more intensive use of some inner urban areas.) In this context, there may be reason for rejecting the project even if the benefits outweigh the measured costs. (Since no one has performed a thorough cost-benefit analysis for the Sydney runway, we do not know whether this circumstance arises there.)

Even in these extreme cases, there is of course no call for the abandonment of cost-benefit analysis. Rather, such analysis should be undertaken, and should be made as comprehensive as possible. The calculations should then be complemented by a qualitative account of that which has not been qualified, so as to make the decision-maker as well informed as is feasible. Thus the approach in these cases where effects can not be quantified is similar to that discussed earlier for the cases where physical quantification is possible but economic evaluation lacks solid foundation.

To sum up, the general principle remains: economic modelling should be considered mandatory, it should be based on the revealed preferences of individual users - or, in practice, on the best estimates thereof - and the project should not proceed unless the estimated benefits are judged to outweigh the estimated costs, in aggregate. (Remember that distributional questions, that may possibly justify disaggregation, are reserved for later consideration.)

To convert the principle into good practice is by no means easy. Some of the procedural and institutional difficulties are considered in the next section.

### **Institutional issues in central planning**

If a government wants its way, then generally power prevails, no matter how poor the economic properties of the preferred scheme. Even in that context, there are still two important roles for rational economic modelling. First, on the inside, the transport professionals may be able to shape the details of the scheme, by offering advice that identifies the best (the least damaging) of the alternatives within the range that the government will countenance.

Secondly, power is rarely absolute. Thus, on the outside, public discussion of, and education in, the economic issues may improve voter understanding and (with luck) limit the exercise of arbitrary power.

Consider now the more optimistic circumstance in which the minister, or the government as a whole, places significant weight on notions of economic efficiency and democracy, to such an extent that this curbs but does not wholly cancel personal ambitions for pet schemes, nor the effectiveness of lobbying from narrow sectional interests. Here, we suppose, the government does want sound analysis. In this context, what institutional practice will help to produce it?

A first point is suggested by the history of airport planning in Sydney. When judged by the criterion adopted in this paper, the most worthy (by far) of the analyses of the capacity-expansion issue is the MANS study. This adopted an open-minded approach, reviewed a fairly wide range of alternatives, and tried hard to evaluate them with the help of cost-benefit analysis; in large measure it succeeded in that objective (Mills, 1982). It is undoubtedly significant that the terms of reference for that study were not restrictive. The professionals were asked to compare alternatives, especially the choice between extension at the existing port and construction at a second site. (Ostensibly, at least, the government of the day had not prejudged that issue.) Furthermore, there was a great emphasis on public consultation. Cynics may suggest that this was mainly for 'show'; but one aspect of it was certainly of intrinsic value - the structure of the economic calculations and the results were exposed to public scrutiny.

In contrast, the 1990/91 process of drawing up an Environmental Impact Statement was placed in a very different context. The government had already committed itself to a policy, namely to construct a third runway; its decision was announced (Prime Minister, 1989) immediately after a Cabinet meeting which ended in the small hours. In that announcement, paragraph 7 states that the main decision and some supporting decisions "have been taken following an exhaustive analysis of the economic and aviation policy aspects of all options for meeting Sydney's airport needs. The complexity of the issues required the most sophisticated analysis yet undertaken of the interaction between demand growth, airport capacity and traffic management at Sydney. This analysis, conducted by Commonwealth officials, reveals that the economically rational option is to build a third runway at KSA subject to an EIS, and proceed with the development of Badgery's Creek but not on a fast-track basis."

The remaining three paragraphs go on to identify the three matters which, ostensibly, persuaded the government. These coincide with the three phenomena that are given numerical representation in the scheme of evaluation later established by the consultants for the EIS, and described earlier in this paper.

The moral is clear: if government wants good economic evaluation, then the professionals should be put to work early in the piece, without prior and restrictive commitment by government, and with the professionals knowing that their work will be exposed to public scrutiny.

While open and honest public discussion will help to preclude unnecessary critical reaction and bitterness on the part of affected groups, there is no guarantee that the policy which scores best in the economic evaluation will win acceptance from all. Quite naturally and properly, there will be opposition from those who are to lose if the policy is implemented. It is also understandable that those whose activities result in negative externalities may wish to pursue their own goals no matter the extent of the costs to others. Perhaps understandable but not always excusable is an authoritarian government position which requires adversely-affected groups to suffer 'in the public-interest'. If affected groups are to be given a right of veto, however, is policy paralysis the inevitable outcome?

### A 'modest' proposal for the resolution of conflict

Some helpful insights are to be gained from the paradigm of welfare economics, which is that part of neo-classical economics from which cost-benefit analysis is derived. At the risk of slight technical over-simplification, the main message may be stated succinctly: if a policy proposal is desirable in aggregate, then the benefits to the groups that gain will outweigh the costs to any parties that lose; if government is not concerned about distributional issues, then the aggregate measure suffices and the policy can be adopted; on the other hand, if government is concerned to protect parties that lose, the policy can still proceed, provided the government insists that the gainers compensate the losers - and we note that this is feasible, in principle, because for a proposal which is desirable in aggregate, the benefits outweigh the costs. The principles and technicalities of such 'compensation tests' are presented in welfare-economics texts - see, for example, Rowley and Peacock, 1975, pp.46-51, and Boadway and Bruce, 1984, pp.96-102. The better texts on cost-benefit analysis usually have good statements - see, for example, Pearce and Nash, 1981, pp.27-31, and Sugden and Williams, 1978, Chapter 7.

Besides conceptual problems, there are of course practical difficulties in arranging compensation. Among the institutional sources of difficulty is the likelihood of fierce opposition from those parties who are called upon to pay: why pay for something if you can get it free? (In the context of pollution and other negative externalities, it is well known that industry typically prefers administrative limitation of pollution, rather than payment for licences to pollute.)

There is also a significant intrinsic problem, viz. how to measure the amount of the losses that are to be compensated. The obvious difficulty is that losers will likely overstate their losses in the hope of increasing the compensation payments. There are two possible approaches to this.

Under central planning, the government makes the estimate of the losses. To do so, it uses revealed preference estimates, as already discussed. The danger is that political pressures will encourage the government to depart from that relatively-objective basis: either those to be compensated will muster enough voting strength to persuade the government to overcompensate, or (more likely?) the industry that creates the losses will have enough lobby-power to establish undercompensation.

The alternative is a decentralised, or deregulated, approach, in which the parties are left to bargain. If the prospective losers are not satisfied with the compensation that is offered, then either the policy is not implemented, or there is a decision by a court, or by some other process of adjudication, to determine the outcome, including the payment of any compensation. Of course, this requires prior definition of rights, and their enshrinement in legislation where necessary.

Even though these rights probably should be limited to fundamental matters, such as a right to quiet in residential areas, there can be considerable difficulty in framing the rights. For example, should rights be held by individual home-owners, or collectively by the group of owners in a defined area? Should all rights be tradeable against compensation payments? Which rights should be grandfathered? (For instance, should there be rescinding - at least in respect of new areas of noise exposure - of the present legislative protection for some creators of noise, for example the licence granted to aircraft operators?)

Even when these fundamental issues are settled, decentralisation brings many other practical problems. Who should bargain on behalf of those to be compensated - a voluntary association of individuals, or a mandated agent such as a local government authority? Precisely who should receive the compensation? The democratic principle requires payment directly to the affected individuals; but in the decentralised approach, payment might go instead to the bargaining agent, in the first instance, at least. In the event of failure to negotiate a settlement, should the party seeking to change the status quo have the right of access to a court or other process of compulsory adjudication? If so, how should the adjudication principles be designed?

In regard to the issue of compulsory adjudication, it is widely recognised (1) that where such does not exist, obstinate parties may hold out against proposals that score highly in terms of economic efficiency; and (2) that when such adjudication does exist, its terms have a major influence on what the parties will accept in voluntary negotiation. (The latter point has been demonstrated in laboratory experiments designed to represent another transport context which has an interesting parallel to the present issues - namely, sharing of limited runway capacity among airlines, for which see Grether and others, 1981.)

Thus the terms of any compulsory adjudication are of crucial importance. There is no guarantee that such adjudication will ensure adoption if and only if the project scores highly in terms of economic efficiency. Such an outcome is made more likely by flexibility in compensation arrangements, both in negotiation and in the fall-back adjudication process, as is argued in some interesting theoretical work in Porter, 1988. (Also of interest in the recent literature is a paper by Kunreuther and others, 1987, which proposes and conducts laboratory experiments on a bargaining procedure for determination of the location of a facility that creates negative externalities.)

The problems and difficulties of bargaining and adjudicating for compensation payments have been emphasised in order to make it clear that there is no easy, simple panacea. But the quest is not for a perfect alternative. The present difficulties in transport planning, especially in regard to infrastructure, are so great that some improvement is surely possible.

Although the very idea of compensation may seem far-fetched, that is only because we are accustomed to a society that considers it proper to ignore some individual rights, even though many property rights are strenuously protected. The intrinsic difficulties in paying compensation to losers from transport proposals - generally those who suffer noise or other externalities, or who are displaced from existing land use - are surely no greater than those met in effecting other types of compensation. If that is so, then a change of attitude could work wonders for the resolution of conflict in transport planning.

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References

- Boadway, R.W. and Bruce, N. (1984) *Welfare Economics* Oxford: Blackwell
- Chambers, L. and Ker, I. (1991) Users' wants? Bah! Users' expectations? Maybe! Users' needs? OK! *Papers of the Australasian Transport Research Forum* 16, 1-8
- Dasgupta, A.K. and Pearce, D.W. (1972) *Cost Benefit Analysis: Theory and Practice* London: Macmillan
- Department of Finance (1991) *Handbook of Cost-Benefit Analysis* Canberra: AGPS
- Elster, J. (1989) *Nuts and Bolts for the Social Sciences* Cambridge: Cambridge University Press
- Etzioni, A. (1968) *The Active Society. A theory of social and political processes* London: Collier-Macmillan
- Flowerdew, A. D.J. (1972) Choosing a site for the Third London Airport: the Roskill Commission's approach, printed as pp. 431-451 of Layard (1972)
- Grether, D.M., Isaac, R.M. and Plott, C.R. (1981) The allocation of landing rights by unanimity among competitors *American Economic Review* 71 (Papers and Proceedings) 166-171
- Harrison, A.J. and Quarmby, D.A. (1969) The value of time, reprinted in Layard (1972)
- Kinhill Engineers Pty Ltd (1990) *Proposed Third Runway Sydney (Kingsford Smith) Airport - Draft Environmental Impact Statement* Sydney: Federal Airports Corporation
- Kinhill Engineers Pty Ltd (1991) *Proposed Third Runway Sydney (Kingsford Smith) Airport - Supplement to the Draft Environmental Impact Statement (Volume 1)* Sydney: Federal Airports Corporation
- Kunreuther, H. and others (1987) A compensation mechanism for siting noxious facilities: theory and experimental design *Journal of Environmental Economics and Management* 14, 371-383
- Layard, R. (ed.) (1972) *Cost-Benefit Analysis* Harmondsworth: Penguin Books
- Lichfield, N. (1968) Economics in town planning *Town Planning Review* 39, 5-20
- Mills, G. (1982) Investment in airport capacity - a critical review of the MANS (Major Airport Needs of Sydney) study *Papers of the Australasian Transport Research Forum* 7, 171-210

- Pearce, D.W. and Nash, C.A. (1981) *The Social Appraisal of Projects* London: Macmillan
- Porter, R.C. (1988) Environmental negotiation: its potential and its economic efficiency *Journal of Environmental Economics and Management* 15, 129-142
- Prime Minister (1989) *Media Statement*, issued jointly with the Minister for Transport and Communications 22 March 1989
- Rowley, C.K. and Peacock, A.T. (1975) *Welfare Economics - A Liberal Restatement* London: Martin Robertson
- Simon, H.A. (1957) *Administrative Behaviour* London: Macmillan
- Simon, H.A. (1983) *Reason in Human Affairs* Oxford: Blackwell
- Stephens, M. (1991) Do modernist researchers know what postmodern users want? *Papers of the Australasian Transport Research Forum* 16, 9-22
- Sugden, R. and Williams, A. (1979) *The Principles of Practical Cost-Benefit Analysis* Oxford: Oxford University