

TRANSPORT POLICY AND RESEARCH:
SOME EXAMPLES OF THEIR INTERACTION

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ABSTRACT:

Transport research is of little use unless, to some degree, it contributes to the implementation of new and beneficial policies or practices, either directly or indirectly. This paper selects from a range of topics addressed by the author over the past twenty years and uses them to illustrate the types of conditions which are conducive to research making a contribution, and to illustrate inhibitors to acceptance. While addressing the forum topic: translating research into policy advice, the paper puts emphasis on the process of achieving acceptance and implementation of that advice. The view is also put forward that research, if it is to successfully contribute to policy, must itself relate to perceived policy needs, and either address the policy issues directly, or provide the necessary tools and parameters to enable identified issues to be addressed.

INTRODUCTION

This paper does not dwell on an individual piece of research but, rather, addresses one of the Conference topics: translating research into policy advice. In doing so it goes further, addressing the issue of how to assist the translation of research findings into policies, decisions and actions.

At the outset, I should make it clear that by "research", I mean evaluation, investigation of actual problems, forecasting and the like, together with supporting techniques for these. I do not refer to abstract research of the type which makes no attempt to influence events or to have specific application.

The title of this paper recognises that research both arises from and contributes to transport policy, either directly or indirectly. Transport research, if it is to stand much chance of being applied, must address a need - either a policy need or, at one step removed, a need for better techniques with which to address a real world problem. Other than in the most exceptional circumstances, the need will be evident and will give rise to research which, if successful, will ultimately result in some effect taking place in the real world.

We are all conscious that if, ultimately, our work does not in some way cause the world to differ a little from what it would have been in the absence of our efforts, then we are wasting our time. That is not to say, of course, that we can win every time - and, at the very least, we can always get some educational value out of research which falls flat on its face. But the aim is to achieve the implementation of something worth doing.

In this paper, I will first put forward some broad thoughts about the nature of transport policy research. With those thoughts in mind, I will pick out a fairly diverse range of examples from my experience in this field and use them as illustrations. Finally, I will draw some general conclusions on the factors which help or hinder the translation of research findings not simply into advice, but into beneficial changes in transport policy.

THE NATURE OF TRANSPORT POLICY RESEARCH

Transport policy research covers a tremendous breadth of topics across all modes, with a wide range of technical approaches. It can sometimes be technically simple, eg a

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straightforward piece of regression analysis on available data, but the issue addressed may be complex with a number of stakeholders having strong and conflicting interests in the conclusions.

The reverse may also be true: the technical analysis may involve complex data collection, forecasting and simulation models, for example. But the issue may be a very simple one.

Typically, transport policy research is initiated in response to an identified need for more information on an issue. Certainly, it helps enormously in the implementation of change if there is already interest in an issue at the decision making level.

When Is Transport Policy Research Called For?

I suggest there are three main reasons, and one subsidiary reason, for research being initiated.

First, to answer a straightforward question. Sometimes, it is necessary to find out whether a transport investment is financially justifiable, for example. A variation on this theme is to try to choose the best of several alternatives. However, as complexity increases, this blends in to the second major reason for research -

Second, to ensure that a proposal for major change, or a choice between alternatives on a complex issue, has been thoroughly examined. This type of research often has an almost ceremonial air about it. Teams are set up, complex surveys and analysis are undertaken, very large and glossy reports are produced. The results, very often, come as no surprise but the process of everything being seen to be looked at in great depth and very conscientiously is a necessary precursor to decision making when the going is heavy. This is not to diminish the considerable importance of this kind of research - it often provides a very important perspective, not previously available, on the extent of benefits obtainable from a policy change. Also, very importantly, this type of research often identifies changes in equity. Implications for equity are fundamental to the acceptability of new policies.

The subsidiary reason for calling for research arises out of the second reason just given. It is to take the heat off for a while! I have yet to encounter a blatant example of research being initiated purely as a delaying tactic but there have certainly been cases where it has been made clear that there is no hurry for the completion of a report.

While we can bask enjoyably in the cynicism of this sort of thing, it is not necessarily bad. If an issue is so sensitive that it needs to be kept on ice for a while then it is probably a good thing for it to be subject to close, dispassionate, analytical attention.

A variation on this theme is the use of research to provide material for the promotion of a new concept. However, this is usually straightforward presentation of statistics and the like, and on the fringes of research proper.

The third main reason for calling for research is in order to develop techniques and parameters as tools for use in the first and second categories above. Examples of this are the value of time or the value of road accidents, or the development of more sophisticated algorithms.

These reasons may all occur together to some degree. Often we get the case where there is a big project responding to a policy question which, in turn, has a number of sub-components. At that level, there may well be generation of ideas, which have not been directly sought, and which can still be usefully followed up in their own right.

Finally, while I have emphasised that research stands its best chance of being useful if it is in response to an identified policy need, "decision makers" have no exclusive ability to recognise need. Professionals should not simply react to requests put upon them. I suggest, however, that scarce resources will be best used if the need for policy development in an area, and the need for associated research, are first canvassed with the ultimate recipients of the advice. The marketing of worthwhile subjects for investigation, in advance of committing substantial resources, greatly improves the chances of research results being put into practice, and it also avoids wasting resources on topics which are not currently on the agenda for advice.

Undertaking a piece of research and then dropping the report on the desk of someone who has had no prior involvement is very seldom successful. As in other areas, solutions looking for problems are difficult to market.

SOME EXAMPLES

The Evaluation of URBA

In the late 1960s, the UK Ministry of Transport undertook a Land Use Transport Study in Manchester. This tied in with the Manchester Rapid Transit Study. Heavy rapid transit

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proved to be unattractive economically but someone got to the Minister's ear about a novel French system, called URBA.

URBA was an intermediate capacity rapid transit system, in its design stage. With projected lower costs and lower capacities it was suggested that it might be economically attractive given the comparatively low patronage figures which told against heavy rail.

Technically, URBA was a suspended monorail with the unusual feature that its bogies were supported by air cushions. This led to the interesting characteristic that excess loading would stop the train moving, since it would sit down on its track. Therefore, an all-seating arrangement was designed in, with no head room for standees.

As a technical exercise, this was reasonably challenging. Costs were sensitive to the capacity provided. So was the disutility of travel - once a train became full, the next passengers in line had to wait for the next train with spare seats.

Simulating this rapid transit system meant devising something which could take account of this rather unusual characteristic, and which could interface with the main Land Use Transport model to adjust its disutility matrices and so generate loadings (followed by more iterations) and a value for the consumers' surplus.

The difficulties were the technical ones of making a rather unstable system converge and of interpolating between full runs of the main model, since the undertaking of a full run was quite a daunting and involved exercise.

Following the examination of a very wide range of fare structures and operational configurations it proved quite impossible to get a reasonable benefit/cost ratio (Hodgkin (1971)).

As a result, it was readily agreed that the idea was not worth pursuing and we heard no more about it.

This illustrates two points:

Analytical complexity in a research project does not necessarily mean that the issue is complicated - in this case a straightforward answer was required to the question of whether this device could be economically worthwhile. There appeared to be no complicating vested interests.

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It is important to avoid the potential bias inherent in the wish to conclude something positive. In this case, the thing was not justifiable and we said so. Nevertheless, it left Manchester without any high quality public transport focus, and it is human to want to be behind the introduction of something good.

Proposal for A Tonnage Levy on Fremantle Shipping to Fund Painters and Dockers

The Painters and Dockers are a casual workforce at Fremantle and their job is to undertake general repair work on ships, stowage of deck cargo, the cleaning of holds, and the like. They are paid by the hour but are guaranteed a minimum weekly wage in case insufficient work is available. Funds to support this guarantee (and other things like leave) are levied by the man hour from the employers. In effect, this doubles the wages which have to be paid.

The Union, noting that the amount of work available seemed to be dropping, realised that this would have a multiplier effect on the gross hourly rate so that employers would be discouraged still further from using the workforce. It therefore proposed that the funding should be raised instead from a levy per gross registered tonne on ships entering Fremantle.

Not surprisingly, there was some debate about this.

Early on in the debate, it was suggested that the best solution would be to reduce the size of the workforce. The Government, however, made it quite clear that this was unacceptable. Indeed, the employers did not press for it - presumably because they wanted to keep the industrial peace. With that ground rule set, we concentrated on the pricing/levy issue.

We undertook some standard, multiple regression analysis. Essentially, this looked at the rates paid to the men over a number of years, corrected for inflation, together with the amount of work they were asked to do. We addressed seasonality and we looked at the possibility of there being a long term trend in the amount of work, irrespective of price, because of technological changes in ships.

As a result, we came to the conclusion that there was a fair chance that a reduction in the amount of money paid up front per man hour would result in significantly more work, giving better utilisation of the workforce and a reduction in the average costs of using it (Co-ordinator General of Transport (1985)).

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Developing the theme further, we also suggested that different rates should be struck depending on the type of ship because some types of ship made much more use of this workforce than others and there was acrimony about the idea of introducing a payment system which required everyone to pay more or less equally, irrespective of the use made of the workforce.

In contrast to the URBA Study, this exercise was analytically straightforward but addressed a complex issue.

To complete the story, the Government agreed to go ahead with a tonnage levy along the lines developed in the analysis. It received the full treatment of explanations to the affected bodies, and to the press; the drafting of legislation necessary for its implementation; second reading speech and committee notes; briefing of the Opposition. However, the Opposition in Western Australia has a majority in the Upper House and there was sufficient antipathy to the proposal to cause them to throw the Bill out.

This arose because:

- . there was still concern about equitable payments by users of the workforce - shipping agents wanted direct payment for service, not something averaged across classes of ship with the air of an insurance premium.
- . there was a wider issue in that, nationally, the employers were worried about the precedent which could be set.

Equity, and wider issues than those addressed by research, are both powerful inhibitors to the acceptance of research recommendations.

A further lesson is that, of course, you can't win them all.

The complete rejection of an idea, however, does not necessarily mean that no benefit can arise from it. In this case, I am convinced that the obvious efforts being made to help this union out of its dilemma materially contributed to a reduction in the Fremantle waterfront industrial unrest over the years of this saga.

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Evaluation of a Proposed Bus Station to the North of Perth's CBD.

Perth's north-east bus routes pass through the central city and terminate on Barrack Square by the river. They then return through the city, picking up passengers, on their way out to the suburbs again.

A few years ago, it was suggested that economies could be made by terminating these buses short of the city, to the north of the CBD. Two other factors lent support to this idea. First, buses add to traffic congestion and there were many who thought it would be a good idea to get them out of the way to give the cars a clear run. Second, the redevelopment of Forrest Place was being initiated and the planners thought that the vitality and commercial attractiveness of this area would be greatly increased if people had to walk through it to get from their buses to their offices, and vice versa.

Nobody seemed to care too much that the bus passengers would have to walk further.

The approach to this problem was not dissimilar to that taken in the URBA study fifteen years earlier (an interesting reflection in itself!) A simulation model was developed for the walk trips between bus stops and workplaces and this was used in conjunction with the Perth Strategic Model. The simulation model adjusted the matrix of disutilities in the strategic model so that flows, and the consumers' surplus, could be estimated.

This exercise showed that the effect of replacing the on-street bus stops with a bus station on the edge of the CBD would be to reduce the number of trips on north-east bus routes by about 1,000 per day, with corresponding disbenefits (Co-ordinator General of Transport, et al (1982)).

Nevertheless, this issue remained a matter of intense debate. While eventually it was agreed that there would not be such a bus station, the decision hung in the balance for some time, and the fact that a fairly sophisticated piece of research had been undertaken was only one factor in the decision making process.

The points which this illustrates are:

- . The readiness with which research findings are accepted as advice depends very little on the sophistication of the research. Of far greater importance is the

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complexity of the issue, particularly the extent to which interest groups have strong and conflicting views.

For research findings to have influence they must be translated into terms which a layman can visualise and relate to. They must either confirm common sense or, if they appear to contradict that, the logic must be explained in a way which appeals to common sense.

Study of Bus Irregularity in London

The tendency of buses to appear in friendly groups of half a dozen at once, followed by a half hour gap is well known. When I was working in London it was decided that a way should be found to overcome this.

All buses ran to a timetable (though this wasn't published for frequent services). It quickly became evident that buses were often delayed in traffic to the extent that, by the time they arrived at the destination end, it was already after their scheduled departure time.

After going to and fro a number of times the buses became hopelessly late and the natural tendency of buses to cluster closer together grew inevitably throughout the day. (The first bus after a gap encounters more passengers than average and is slowed because of the time passengers take to board and alight. This inevitably means that the buses behind catch up. Bunches are therefore a stable condition.)

The fairly obvious solution to this is to change the schedules so that only rarely do buses arrive at a terminus after they are due to depart from it. That way, irregularity can be corrected at the end of each leg.

Unfortunately, this can only be achieved by scheduling fewer bus miles. In practice, actual operations bore little resemblance to those scheduled since there were only sufficient buses for about 70% of the scheduled trips. Notwithstanding this fact, there was industrial sensitivity about any suggestion that scheduled miles should be reduced.

Because of this, a study was initiated into the whole irregularity issue. It was a study of the type I like to think of as "ceremonial".

We intensely examined Route 14 which runs from one side of London (Putney), through the West End and out the other side (to Hornsey Rise). Route length is about fifteen kilometres. This route also had the complicating factor that it was operated from two garages.

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We had an intensive survey involving about 150 students riding on every bus for three days, clicking stop watches at every bus stop and traffic light, and counting passengers on and off. We had a computerised simulation model using Monte Carlo methods, drawing from the extensive data we had available about delays. In the middle of all this I emigrated to a sunnier clime but the end result of the study was unaffected! It became possible, using a computer programme, to demonstrate how regularity could be improved, particularly by allowing a more realistic amount of "layover time" in the schedule.

I was pleased to hear that London Transport, in fact, moved some way in this direction.

This illustrates that, sometimes, research findings are evident without the research. The research itself then becomes largely a means of demonstrating conclusions. It is part of the sales package.

This might be offensive to the purist but, for someone whose interest is in getting things done, it is a legitimate function of research. Nor is the picture quite as cynical as that just painted. Investigating a complex system inevitably improves the understanding of how it works and can lead to other useful, related proposals. In the case of this exercise, some ingenious work reducing practices by bus drivers were discovered (for example, by being sufficiently late, but not too much, at particular points on the route, they could guarantee finishing the shift early). These issues were separately addressed and, no doubt, helped contain the irregularity problem.

Unleaded Petrol

Of the examples of research given in this paper, this is the only one in which I was not personally involved - though I was heavily involved in the implementation phase of the new policy in Western Australia.

I have included this example because it was a comprehensive piece of research - a model of the Australian oil refining system, models of car efficiency and emissions profiles, forecasts of vehicle kilometres travelled in Australian cities - and it was implemented quickly and successfully. This research was undertaken for the Committee on Motor Vehicle Emissions, reporting to the Australian Transport Advisory Council in 1981. It compared a number of approaches to meeting more stringent targets for vehicle exhaust emissions, including the adoption of unleaded petrol

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and reliance on catalytic control of pollution in the exhaust pipe (Committee on Motor Vehicle Emissions (1981)).

For those not familiar with this issue, the approach taken from 1976 on was to constrain the combustion process in cars so that the amounts of carbon monoxide, hydrocarbons and nitrogen oxides in exhaust gases were below specified limits. The snag was that this tended to interfere with both power and fuel economy and, in the late 1970s, we were hit by a fuel crisis. To oversimplify, the recommended approach put no constraint on the combustion process but, instead, uses a catalyst device in the exhaust pipe to clean the gases after they leave the engine. It is very effective, allowing much cleaner exhausts than the previous method without the fuel consumption penalty.

The complicating factor is that available catalyst materials very quickly become ineffective if contaminated by lead, and lead compounds have been added to petrol for decades as a cheap means of giving a high octane rating. That, in turn, means that the petrol is more stable and an engine designed to take advantage of this characteristic has better fuel efficiency than one designed to run on low octane petrol.

The choice of octane rating for the new, unleaded petrol, had implications for both refinery efficiency and vehicle efficiency and was selected, in consultation with industry, with the aim of giving the best overall efficiency in the conversion of crude oil to the movement of cars.

The national decision to adopt the unleaded petrol policy was made almost immediately, in 1981, by Commonwealth and State Transport Ministers. It took effect in January 1986, as planned.

It could be argued that this decision was an inevitable one because the NSW Government had already announced that it would unilaterally follow an unleaded petrol policy. With 40 per cent of the car market, NSW was in a strong position to force a similar policy onto the other States. Nevertheless, the concurrence of Victoria and Queensland in particular remained in doubt right to the end and, had they been determined not to adopt an unleaded petrol policy (an attitude held by some of the less populous states) there could have been an impasse, with an unpredictable outcome.

The successful adoption of the results of this research arose from:

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a very strong desire for a solution to a difficult problem - the conflict between the need for still cleaner exhausts, strongly perceived by New South Wales, and the elimination of the fuel consumption penalty of existing types of emission control, which was an embarrassment at the time of the fuel crisis and which would have been made worse by stricter limits.

there was no obvious shift in equity. States with comparatively clean air did not need the improved pollution control of unleaded petrol and expressed opposition. Nevertheless, it was impractical for different types of car to be sold to different States and the new policy avoided the threat of even poorer fuel consumption from new cars. Once the determination of the more populous States became evident, the others followed.

the environmental lobby also gained. Apart from reduced levels of polluting exhaust gases, there was concern about the health dangers of lead itself and the new policy obviously helped that.

While there was opposition from the motor industry and the oil industry (and, not surprisingly, from the suppliers of lead additives for petrol) it was never able to be sustained against the integrity of the analysis undertaken and the clear need to solve a genuine conflict.

Value of Time for Freight

This was a piece of work in the support category and it was a precursor to the Southern Western Australia Transport Study (see below).

It was anticipated that, if a change were to be made from regulated freight transport to a more competitive system then the time taken to transport goods would be relevant both in determining mode choice and in evaluating one policy relative to the other.

Suffice it to say that we collected data on the transport of goods where there was a choice of freight rate associated with different journey times. This was for goods taken from Perth to the north west, traffic which was not regulated. After a fair bit of experimentation with statistical techniques we managed to get a relationship. In 1975 we came up with \$10 per tonne per day for general goods as a value of time (Hodgkin & Starkie (1978)).

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However, when we came to apply this to transport in the southern part of the State, in the Southern Western Australia Transport Study, it was pointed out that the majority of trips by rail were overnight and that there was no real gain to be had from faster journeys which would deliver goods to people before they woke up.

There was some plausibility in this and, in applying the value of time for freight in the SWATS Study, we effectively discounted hours which were not part of the normal country working day.

This illustrates the point that supporting research, while having integrity in itself, nevertheless needs to be applied judiciously when used as input to a wider issue.

Southern Western Australia Transport Study (SWATS)

SWATS was announced at ATRF in 1978 - the last time it was held in Perth. To some extent this was, again, a ceremonial study. It found that the freight transport policy which would incur the lowest use of resources was one in which there was freedom of competition and in which prices were set equal to long run marginal costs. This will not surprise many economists.

Of course, the intensive data collection, modelling and consultative exercises of SWATS also brought a wealth of other information to light about our freight transport system (Southern Western Australia Transport Study (1977)). I do not belittle that study in the least, and I was pleased to participate in it.

The comprehensiveness of the study has been important in facilitating the implementation of its recommendations: General goods traffic was deregulated in 1982. Wool was deregulated in 1986. Bulk commodities are still undergoing review. Nor did implementation just happen. Concerted and sustained efforts were made over a number of years, consulting with affected parties, to enable the Government to move forward with confidence. SWATS was a classic example of the completion of the report being treated not as the end of a study, but as a second beginning.

SWATS took the stance that its recommendations should be seen as a package not as a shopping list - a potentially dangerous approach since the acceptance of advice is made more difficult if it is closely prescribed. Because of the nature of the recommendations, this package approach was nevertheless important. For example, with competition being introduced it was seen as essential that Westrail

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should have the ability to turn away traffic which it considered uneconomic. That is, it should no longer be a common carrier. The study redeemed itself from this package approach by recommending that deregulation take place in stages over a period of about ten years. This allowed room for manoeuvre and assisted acceptance.

It is also interesting to recall that, at the time of the completion of the SWATS study, there was a wrangle about the amount of money adoption of its policy would save. The study team estimated a net saving of \$14 million per annum (1975 dollars) which "in practice would be substantially greater because of efficiencies generated by competition." Westrail recalculated the figure at a very much lower value. Interestingly, the figure appeared to be of very little relevance to the decision on whether to adopt the SWATS recommendations. The climate was obviously right for a move to deregulation. The advice being sought was not how great would be the benefits but how best could the recommended policy be implemented.

As indicated above, considerable progress has been made with the deregulation recommended by SWATS, but bulk traffics still remain largely regulated to rail. The main inhibitor remains the difficulty of recovering the costs of increased road damage for bulk traffics transferring to road. It is an area where institutional pressures, on both sides, are so great that research results are difficult to sell and the status quo tends to remain by default.

CONCLUSIONS

In the foregoing, I have used a number of individual examples to illustrate points which I believe are general in the process of using research as a tool in the development and implementation of worthwhile new policies.

In summary, the following characteristics will help transport research results to flow through into implementation:

- . The research should stem from a perceived need, relating to a problem which is recognised at a political level. The more desperate the problem, the more likely it is that a credible solution to it will be adopted.
- the professional can legitimately draw attention to an emerging problem, but there is no point in producing solutions and then seeking problems to use them for.

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- working on a problem in anticipation of a request to do so is a reasonable tactic but it can be wasteful if an expected request does not materialise. It is more efficient to try to provoke worthwhile requests.

A straightforward issue with little controversy or conflict, and with nobody being made worse off, is more likely to have recommendations for it accepted readily.

If an identifiable group, preferably of influence, can perceive itself to be made better off by the recommendations, the chances of implementation will increase further.

Sophisticated findings need to be presented in such a way that laymen can visualise and relate to them. They must either accord with commonsense or, if findings are unexpected, the logic behind them must be explained in a way which can be grasped by commonsense. Recommendations should have integrity and should be dispassionate. A negative recommendation, if correct, is just as legitimate as a positive one and the temptation to be seen to recommend something new for the sake of it should be resisted. (One way is to recommend a "continuation of current practice", rather than to recommend "no change"!)

Enormous amounts of patience and follow-up effort are often necessary. SWATS, for example, reported over 10 years ago. There has been implementation of its findings over a range of goods but the treatment of bulk transport is still under consideration.

Some room to manoeuvre in selecting recommendations helps acceptance in the absence of other strong forces for acceptance.

- It is important to recognise that there may be wider issues which inhibit the acceptance of recommendations. Any win, whether in whole or in part, should be a source of satisfaction.

The channelling of credit for an idea to those making the decision about it can also help implementation. (It can also help to demotivate researchers unless there is at least internal recognition for the contribution made. However, many of us get job satisfaction from the power behind the throne syndrome and do not need overt glory!)

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In applying supportive research it is necessary to keep an open mind about how it relates to the main issue being addressed. It is easy to slip into the trap of using a "black box" inappropriately. Attention to detail of this type assists the credibility of the overall project, which is of great help in gaining the acceptability of its finding.

Inhibitors to the acceptance of recommendations from research essentially fall into two categories:

. A change in equity. If a community group is made worse off by a policy change, then its objection can seriously modify or even cause the rejection of a policy which is worthwhile overall. To the extent possible, it is important to screen for any such effect and to have solutions to it incorporated in the overall policy proposal.

. A wider agenda. If a proposal conflicts with some unstated ground rules, held by politicians, or by those close to them, or by central agencies of government, for example, then its chances of acceptance will be substantially reduced. Part of the task of successfully undertaking policy research is to sound out and anticipate constraints of this type.

Finally, we have to accept that there will be failures. But all need not necessarily be lost. If research does not bear direct fruit, lessons can always be learned for next time. A close and more educated watch can be kept until a more profitable topic, or a more profitable time for addressing the same topic, emerges.

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