ATRF: WHERE, WHY, WHAT, WHOM AND W.....

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ABSTRACT: *At the invitation of the Chairperson of the 11th ATRF in a deliberation in the Botanical Gardens of Darwin in May 1986, it was suggested that I prepare a paper on the optimal location of future ATRF's for presentation at a future ATRF. The need for a scientific enquiry into this delicate issue arose out of the apparent complexity of the topic which has been seen to require all the skills of transportation planning and management. To assist future organisers of this much sought after item on one's curriculum vitae, this paper sets out guideline parameters upon which to base the priority list of eager offers Since all good forecasting procedures are based on a foundation of solid theory and method as well as a rigorous data base, we use the latest ideas in trans-econometrics and empirical evidence from the first ten ATRF's to calibrate our forecasting model. Descriptive and causal relationships from the past provide essential consumption for the production of future ATRF conferences in Australasia An important finding of our inquiry is the significant role that idiosyncratic fervour (or is it fever) has on the outcome.*

PREFACE

(by Ian Gordon, Secretary, Department of Transport and Public Works, Northern Territory of Australia, speech in Darwin Botanical Gardens, May 1986).

"Ladies and Gentlemen

I have a number of pleasant duties to perform tonight. Before doing so however, I must say that I am privy to the reasons underlying John Taplin's evasion of the exact location of the next conference. I have been served with an order under the freedom of information act, and now must reveal all.

The sordid story goes back some 12 months to the previous conference run by ARRB. Because of the research persuasion of the organisers they commissioned David Hensher to develop a computer simulation model which would, by esoteric calculation, determine optimal locations for future ATRF conferences.

The model was built based on the application of random stratified sampling techniques and multiple regression analysis with an infinite number of dummy variables. A gamma distribution was used with poisson overtones. Because of the use of inter-temporal extensions and conditional indirect utility equations, steam rather than electricity was needed to drive the machine. Unfortunately the input data became enmeshed with the output forming a continuous loop which developed into a small black hole. This engulfed the machine, the operator and much of the data. The remaining small shred of output was examined by your committee over lunch. John Taplin thought it either read 'Kununurra' or was it the design for Bondy's new keel? NT are adamant that it spells 'Borroloola' but could be a bit of the financial evaluation for the Alice Springs to Darwin railway. NSW have reserved their position until after the Murphy Enquiry. ARRB prefer to re-run the simulation for the sake of scientific purity. The BTE put forward a series of options but favour the fragment as the lost part of Keating's J curve. The committee decided that David Hensher be asked to write a paper on the subject for the [a] next ATRF.

We will of course continue our deliberations with a view to coming to a final opinion."

INTRODUCTION

The Australian Transport Research Forum is now thirteen years of age. Its history and geography (and even its accounts) have already been studied as a possible means of commenting on the direction of transportation research and policy in Australia (Starrs and McKenna (1978), Black and Rimmer (1985)). The current paper in one sense is a further investigation of the value of studying the papers of this forum series as a source of wisdom on the transport priorities of the various sectors of the transport community. However in a much different sense this paper looks inward to provide a framework in which we can use historical time series data to understand the motives for the location ('where'), the topics ('what'), the composition of authors ('whom') and the structure of papers ('why') of ATRF conferences. These exploratory insights may assist us in the formal specification of a mathematical model capable of throwing some light on the logic (not logit) of the planning process for a future ATRF. State of the art transeconometric methods are used, together with a new data base compiled from over 3000 pages of ATRF verbage, to assist in this search for the paths of the future. I dedicate this paper to the world's Knox's, Taplin's, Scrafton's and Gordon's.

IN SEARCH OF AN OPTIMAL LOCATION OF FUTURE ATRF'S

The spatial and temporal dimension of the topic requires a dynamic emphasis. A suitable general framework can be developed around the concept of catastrophe as embellished by the Thom-Zeeman theorems on mathematical behaviour. The resulting elementary catastrophes form the basis for guidance on the functional form of the conditional indirect utility expression for the generalised extreme value discrete-choice model on the choice of an ATRF location; as well as the exploratory continuous-choice models explaining sources of causality between the critical dimensions influencing location choice and the extensive set of potential exogenous variables. Catastrophes applicable to the 'soft' sciences, to which ATRF specialises, are called soft catastrophes.

The great appeal of catastrophe theory in the present context is its emphasis on very general kinds of discontinuous process. The non-institutionalised specification of ATRF with its annual element of 'where next' (an important item on the agenda of the founding fathers AGM), and occasional significant discontinuities (in 1980) provide an ideal breeding ground for the germs of catastrophe systems. The ATRF process can be thought of as a system whose behaviour can be described by a finite set of variables x, y, z, ... and controlled by a second finite set of variables a, b, c, ...; under an energy function E which varies

with both sets of variables. We can think of the (x, y, z, ...) set as the set of AIRF locations, and the (a, b, c, ...) set as constraints on AIRF existence (e.g. themes, 'who is interested', dollars). For given levels of (a, b, c, ...) the AIRF system takes up equilibrium values of (x, y, z, ...) corresponding to stationary values of E. E thus becomes the measure of utility (or satisfaction) associated with the conduct of the conference. The fundamental question which we are interested in is: if we now vary (a, b, c, ...), what are the types of jump behaviour in the equilibrium positions that the AIRF system can exhibit, That is, what behavioural patterns, defined in terms of organisation, location, content and control are likely to emerge under various scenarios on the (a, b, c, ...) set and the (x, y, z, ...) set?

The form of elementary catastrophe we posit as applicable to the AIRF choice decision is the cusp catastrophe. The utility function of the cusp catastrophe is of the form

$$U = 0.25x^4 + 0.5ax^2 + bx \qquad (1)$$

where x is a state variable (i.e.choice of AIRF location) and 'a' and 'b' are control variables such as conference themes and participation cost. Functional form (1) has a three-dimensional (x, a, b) space, and generates the cusp catastrophe, with (a, b) = (0, 0) singularity the cusp point, and on the cusp-shaped curves in (a, b) space there occurs a family of folds (Fig. 1.)

Because of the limit on the number of state and control variables (i.e. one dependent or choice variable and two explanatory variables), we will find it convenient to partition the utility function into a strongly separable set, in which various facets of the choice process can be studied in a more digestible manner. In particular we use two-stage 'budgetting' (or decentralisation) which enables each component of influence on the AIRF choice process to be a function of its own set of influences and of the utility allotment to that utility branch. This does not imply that the role of each exogenous variable in the AIRF choice model is independent of the other only through their effect on the utility allotment to each utility branch.

Let us assume that 'a' represents a 'habit' factor and 'b' a theme dimension such as the 'number of authors from location 1 minus the number from location 2'. In Figure 1 then the state variable is the AIRF location decision, with each sheet being ATRF1 and AIRF2. In principle the approach can be generalised to a polychotomous choice set.

Trajectories represent the effects of changing the composition of the author-locations. If 'a' is positive there is no habit effect and the author will select the AIRF which has more local authors. If it is negative, then the author 'jumps' (i.e. selects) the other location after some lag. That is, the decision to participate involved a lot of careful and delayed consideration. If the change is reversed then the jump back in this later situation does not take place at the same point. That is the experience in attending an AIRF at a particular location taints one's attitude towards that location which adds a bias - positive or negative - in relation to subsequent AIRF's. That is, there is a hysteresis (not hysterical) effect.

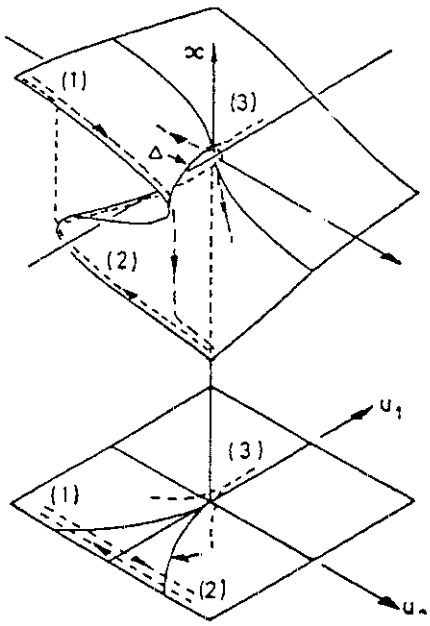


Fig. 1 The Cusp Catastrophe Equilibrium Surface

Jump behaviour can be explicitly modelled with the help of differential equations, which emphasise the behaviour in time of a system. Jump behaviour is one kind of bifurcation behaviour. The solutions to differential equations can take many forms. The main forms are summarised in Figure 2. The mathematics of formal estimation of optimal AIRF location choice using differential equations is complex, and beyond the scope of this exploratory

AIRF: WHERE WHY WHAT WHOM AND W.....

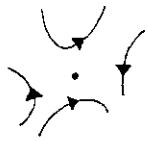
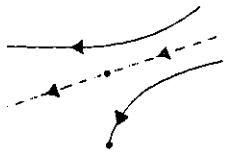
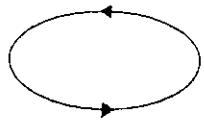
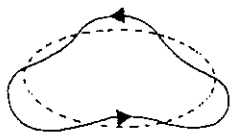
	SOLUTION		COMMENT
1		stable equilibrium	'we all love Christchurch'
2		stable equilibrium	'it took us a while but we all wanted Christchurch'
3		unstable equilibrium	'let's avoid .... for all time, no matter how hard they want AIRF'
4		unstable equilibrium	'it looks like it will never be there'
5		different stable equilibrium points (although formally unstable)	'it looks like we've got a selection problem. We didn't realise it was so popular'
6		structural instability (closed orbit)	'why always in .... or doesn't anyone want it'
7		stable limit cycle	'I think we have a possible taker'

Fig. 2 Solutions to Differential Equations in the Study of the AIRF Process

Note: these are examples of types of solutions to differential equations, all assumed to be in a two dimensional phase space (state variables x_1, x_2).

paper. What we need to do in the current paper is to seek out the main control variables and their contribution to utility. It is also pertinent to identify the influences on the control variables themselves. Given that the AIRF location decision is inherently influenced by human beings, we propose as a starting point an approximate, albeit appropriate, framework for studying individual choice behaviour. We assume that all decisions are taken instantaneously, enabling us to view the process as myopically dynamic, and that individuals are utility maximisers in the fine spirit of good economics. In the next section we outline a theoretical model of individual choice that makes a myopic specification equivalent to a dynamic specification, which greatly simplifies the model.

RATIONALISATION OF THE LOCATION CHOICE PROBLEM

Although it is recognised that the AIRF location decision is a multiperiod optimisation problem with a clear mandate to spread it around Australasia, it would be of great practical significance if the founding fathers or their living representatives could utilise a less demanding single-period approach in location optimisation. Fortunately it is possible to analyse intertemporal decision behaviour with a single-period model without assuming that the decision makers' planning horizon consists of only one period. This is achieved by invoking the condition of revisability; namely that AIRF locators revise their plans annually, implying that they act as if their planning horizon extended over just one period.

Formally we can define the optimisation objective function as:

$$U = U(x_\tau, x_{\tau+1}, \ldots, x_{\tau+s-1}, v_\tau, v_{\tau+1}, \ldots, v_{\tau+s-1}) \qquad (2)$$

subject to

$$\sum_{i-1}^{n} p_t^i (x_t^i + v_t^i) = w_t \quad ; \qquad (3)$$

where x = AIRF previously held in year τ,

v = stock of AIRF possibilities at beginning of year τ,

p_t^i = the unit price of an AIRF conference i in year t,

x_t^i = the size of an AIRF actually held in year t,

v_t^i = the size of an AIRF possibility identified in year t as an option for the future, and

w = the AIRF wealth of resources.

To appreciate the significance of the revisability condition prior to establishing the demand for AIRF locations from the solution to this optimisation problem, consider the behavioural pattern emerging as the schematic situation given in Figure 3.

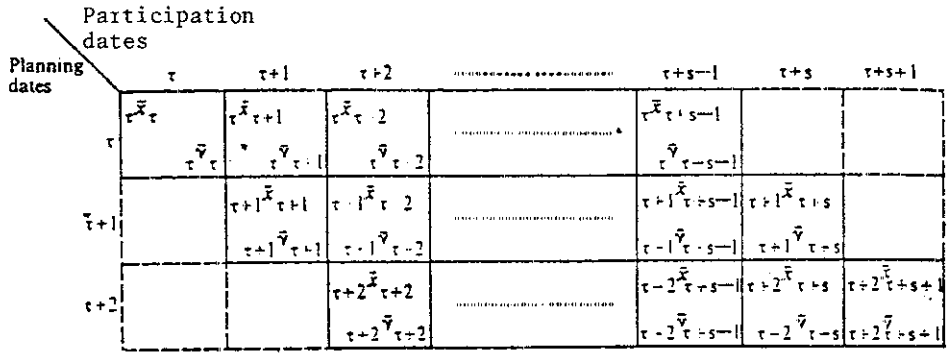


Fig. 2 Revisability as a Realistic Simplification

The top row represents the horizon confronting the locator when he is at the beginning of period τ, and the entries in that row are the planned flows and stocks of ATRF's for the horizon spanning periods τ to (τ+s-1). The other subscript at the lower left side of each x and v indicates the date at which the respective AIRF was planned. At the beginning of period τ+1, the founding fathers draw up a new plan for the periods (τ+1) to (τ+s), shown by the entries in the second row. A similar process is repeated at the beginning of period τ+2, and in each succeeding period ('the roving circus show' or 'circular and cumulative causation').

So long as it is assumed that the locators' utility function undergoes no changes through time, we need not repeat the maximisation process in every round of 'where next?' in order to determine the revised plan. It can be obtained directly from the ATRF demand functions by inserting the locators' level of resources base at the end of the preceding period (which is pretty mean), which we know represents the initial wealth of resources for the new horizon.

The proof of this proposition is available on request, but it suffices to say that we are now in a healthy position to construct an empirical experience from previous ATRF's and to estimate a static model which gives us all the wealth of detail necessary for planning future ATRF's with the aid of cross-sectional transeconometric models.

EMPIRICAL ANALYSIS

The data were obtained from the first ten ATRF's (1975-1985). The absence of data on attendees at each ATRF required us to assume that the paper authors were a representative sample of the population of ATRF enthusiasts. This gave us a sample of 547 authors who contributed 328 papers. A comprehensive data base has been established for this period which can be added to annually if required, providing a frame of reference to assist in identifying any future emphases for ATRF.

The key items of data are summarised in Table 1 for each ATRF and for the combined ten ATRF's. There are a number of very interesting descriptive insights which we can extract from the table. In particular:

1. The very strong participation of Melbourne residents, who are 38.57% of authors, with a very distant Sydney in second place with 19.56%. See Table 2 and Figure 4.

2. The relatively high percentage of contributing authors from the organising committees of the early ATRF's in 1976-1978.

3. Since 1979 we have noticed a relatively homogeneous mean paper length despite the tendency for ATRF volumes to vary quite a lot in overall size, with Canberra taking the prize for sheer print. I wonder why we returned to a more traditional size after that extravaganza?

4. Academics are no more active in paper writing than Federal and State public servants, which is a reflection of the generally poor state of interest in transportation at Universities in particular. In fact we tend to have very few academics from non-university educational establishments. It is interesting to observe the consistently lower percentage of academic authors at the two Adelaide conferences. Any suggestions on this?

5. We have done an appalling job in encouraging students to present papers. This is an area worth investigating for future ATRF's. How about an 'early bird' session for student papers as a mechanism for encouraging students to present drafts of their current research? We could consider integrating the Conference of Australian Institutes of Transport Research (CAITR) with ATRF!

6. The topic mix has naturally changed over time, in part due to the changing priority areas of governments and consequent sources of research funds. The economic theme has been an important one for the ATRF series, representing 47% of all papers. The other main area is transport system management and general methods of transport planning.

7. The hey-days for demand studies were the late seventies, with 1977 its pinnacle (4 out of every 10 papers). The trend in 1984-85 was towards transport management and less emphasis on economics, although we know that the Darwin ATRF in 1986 began the return to the gritty topics of pricing, investment and regulation. Brisbane 1987 also emphasised these theme areas.

8. The modal mix has not been overly dominated by any particular modes nor has any mode been neglected. In recent ATRF's roads have been an emphasis with shipping/ports having a strong input. The interest in intermodal issues has declined quite markedly since 1981. This seems an area for revitalisation. We could also consider encouraging more contributions in the trucking area.

9. One of the most striking results is the consistently dominating bias towards passenger-specific studies. Whereas 53% of papers are in this category, only 13% concentrate on freight. This may, I believe, reflect the general lack of interest in ATRF from those in the freight industry. This may be an area to pursue in future planning.

10. Urban topics dominate the spatial emphasis of papers, representing 50% of the contributions. National topics are a distant second place with 20%. This trend seems quite reasonable in light of the priorities although some more thought might be given to papers on international themes, especially tourism and transport expertise.

This brief overview of the composition of previous ATRF's is useful in guiding the general direction of the series. We can enhance this descriptive appreciation by a causal investigation. We have selected two approaches. In the first approach we seek out the significant influences on the selection of topic areas, modal emphasis, location specialisation and the size and composition of papers. This will assist us in the specification of the myopically-equivalent generalised extreme value ATRF polychotomous location choice model.

Table 3 identifies the significant influences on the four main themes. Once again we can highlight the most interesting findings:

1. Pricing was an important theme in the inaugural AIRF in 1975, but has not had an impact since then. The strong positive influence of residents from Hobart is due to the halcyon days of the Taplin missionary to the Island state. It is an interesting observation on the power and influence of one individual as well as what can be done with government funding of university research.

2. The great 1977 Melbournian flight of fancy into demand modelling is consistent with the strength of the topic around the world at the time. It was the heyday of the disaggregate behavioural travel demand modelling revolution, which subsequently became clearer as an evolution. After 1982 there was an apparent strong lack of interest in the area. State-government persons have tended to avoid this area. Writers on the topic area have tended to use a lot of figures (an artistic lot compared to their pricing colleagues) but have rather few sections in their papers.

3. As anticipated in Table 1, investment was a strong theme of papers in 1984 at the second Adelaide ATRF, with a strong input from Canberra residents. The abstracts were generally on the short side for reasons unknown.

4. The interrelationship between pricing and investment was an important topic area at the Hobart conference which played host to the first (and last) ARRDO report on the rail system, as well as deliberations on air pricing and investment. It is interesting to observe that the organising secretaries of the first Sydney and Hobart conferences were (and still are) economists.

5. Transport management appears to attract no particularly distinguishing positive characteristics, but is a somewhat unattractive area of research for academics. Maybe it is too practical for them? The second conference was notable for the absence of this topic area, which also is avoided by researchers on the current organising committees.

6. As I had anticipated, Adelaide is the great seat for costing, with important research outputs from the loyal supporters from Travers Morgan Partners (a free plug here to add some commercial value to this dissection). There seems to be a plot to place costing papers close to the front of the AIRF proceedings.

7. The first Adelaide conference had a strong interest in organisational planning and management, which is a topic that is low on the agenda of Federal public servants. What needs to be said can apparently be said in a very few pages. The mind is full of curiosity.

8. Transport planning in general was a hot topic area in 1982 and 1983 and a cold topic in AIRF number 1. Authors have a strong belief in weighty reference lists. Hobart residents are not big on this topic - maybe it is not a problem down south.

9. The modal emphasis on air and airports is interestingly the forte of Canberra residents, presumably a strong Federal government input, although this did not show up. Maybe the desire to get away as quickly as possible is implicit herein.

10. Adelaide and Brisbane researchers are into buses and coaches in a significant way and Adelaide likes to hear about it at their conference. By contrast Perth researchers prefer a heavy dose of rail but are not so keen to hear about it on their own territory. Or maybe they just want to get to the east and so prefer to save their work for a conference a long way away. Although there is no evidence to support a preferred location. The authors are mainly State government employees (the Grimwood led pioneers).

11. Canberra residents are not very excited about the automobile and neither are State government people: however the former join academics in the study of shipping and ports. The logic of federal responsibility prevails here.

12. Consultants have apparently found their niche in the study of public transport, especially passenger modes, which shows up in the division of labour. The Feds see relatively little emphasis placed on their own research in this area, which appears to be done in large measure by the consultant sector (the extended arm of government).

13. Taxi's are popular in Hobart and Darwin as an area of research. I can vouch for the Darwin need after the 1986 conference, where the ugly reputation of the local cabbie was empirically confirmed. Plan to leave for the Darwin airport at least one hour and thirty minutes before your flight if you use a taxi from the city.

14. Canberra residents have a lot to say on generalities in transport and tend to find an enormous number of references to support their argument. This perspective seems to be linked to one's previous experience on an organising committee.

15. Interestingly academics are the surrogate truckies in AIRF, although they generally write fairly concise papers on the topic, which is a contrast to the well known extended verbage from this group. Trucks carry freight too also explain the academic interest.

16. The urban contributions have tended to come out of Sydney and Adelaide, with a lesser interest from Perth, Canberra and Darwin. One uses lots of figures to assist in understanding the urban problem. By contrast Canberra residents are big on national topics which are not of great research interest to the other research groups. Less references are used on this topic compared to other topics.

17. Consultants have begun to move into the international spatial area, mainly in public transport.

18. Federal government public servants tend to write the longer papers with long titles, lots of tables and references. Melbourne residents have had their time in supplying lots of tables, but this appears to be in the demand analysis days.

19. Perth residents like long abstracts, but those writing on pricing and investment feel that the message can be given in relatively fewer lines.

These comments are but a selection of the rich empirical bed supplied in Table 3. The evidence therein can be used by future planners of ATRF to guide their promotional material.

To complete the formal econometric analysis I report the results of an inquiry into the choice of an ATRF, estimated using the pooled time-series of cross-sectional data base. Suitable allowance has been made for serial correlation and differential cross-substitutability between pairs of ATRF's. The results are summarised in Table 4.

The two models reported are the end product of an extensive investigation of the myriad configurations of variable possibilities. The specification of equation (1) which gave the best fit on this detailed data base was a linear in parameters and linear in variables function. This suggests a rather interesting non-cuspy optimisation model in which the rules for selection are rather monotonic and open ended. Linear bifurcation appears to be unhelpful. The results are rather disappointing in terms of the overall goodness of fit of these state of the art logit models. The pseudo-r-squareds are 0.029 and 0.022, hardly inspiring. The models are mainly driven by the conference-specific constants. This suggests that if one were to consider which conference type to attend if the 1975-85 conferences were the range of offerings, then the probability of attending is more a function of idiosyncratic speculation than any observable and predictable consideration. Maybe relativity theory is more appropriate than catastrophe theory to the general solution; 'where you are is a state of mind'. The only exceptions to this fundamental and important conclusion are:

1. If you use lots of tables don't go to Brisbane but head for Hobart.
2. If you like wordy titles then Melbourne's your scene.
3. If you like lots of figures, stay on the east coast circuit.
4. If you like writing longish papers then your time is now; the AIRF is more tolerant of this now than in its early days.

CONCLUDING COMMENTS

The theoretical approach in this paper, together with the empirical excursion provide a starting point for a more comprehensive and articulate assessment of a model to optimise the location of AIRF conferences. Although the empirical evidence does provide some interesting insights into the WHERE, WHY, WHAI WHOM AND W... the main conclusion at this juncture is that the unobserved random component of the attendees conditional indirect utility expression is enjoying a position of predominance. We invite the entrophy maximising might of the CSIRO to continue this investigation and to report its findings at some future AIRF.

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I wish to thank David Bedingfield for his assistance in preparing the data base. Ian Gordon has the ultimate responsibility for the simulation model which I understand will be used in draft mode to forecast Darwin's bid for the AIRF. Preliminary applications suggest that the year 2010 should be optimal for Darwin. Many individuals offered advice and compassion; they are all to remain nameless at their own request. One reviewer kindly suggested that 'a paper of this magnitude does take some time to consider. It seems to me to rank in the annals of AIRF in equivalent terms to Hoyle's theories on celestial mechanics'. He also suggested replacing equation 2 with the following:

$$U = \frac{1}{\delta^{m+1}} \int \frac{[X_\tau, \ldots, X_{\tau+s-1}]}{[V_\tau, \ldots, V_{\tau+s-1}]} \, dX$$

where $$\frac{X_\tau}{V_\tau} = \frac{1}{\delta^{m+1}} \left[\sum_{\delta=0}^{m} \frac{m!}{(m-s)!s!} \cdot \frac{(x^{m-n-s+1})}{(V^{m-n})} \right]$$

and $0 \leq s \leq 0$.

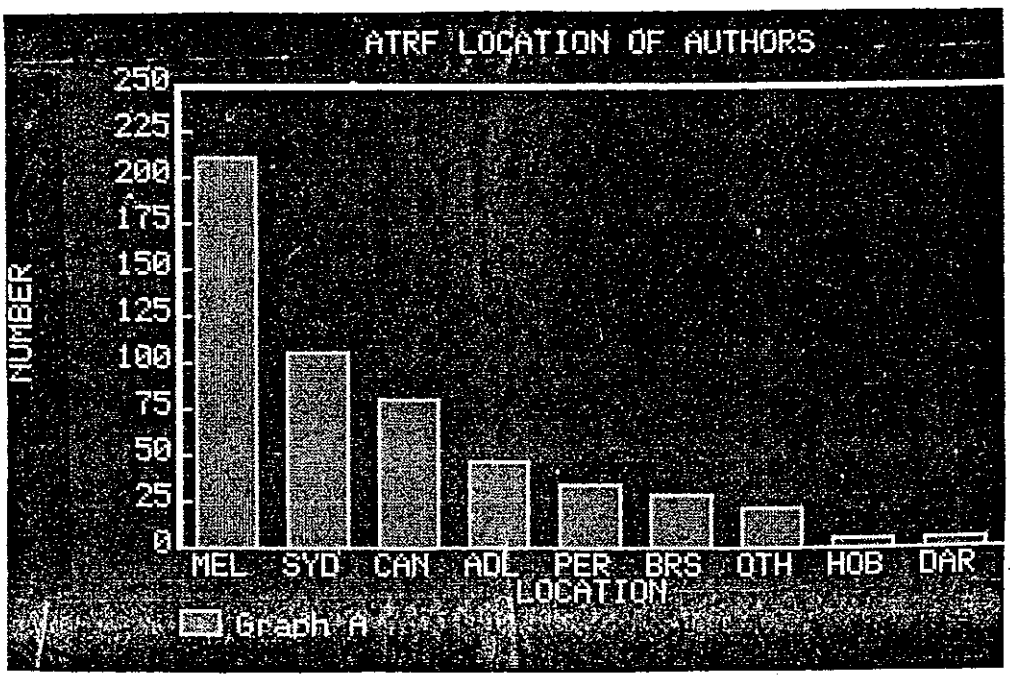
Another reviewer 'laughed until he cried'!

TABLE 1 OVERVIEW DESCRIPTIVE STATISTICS

VARIABLE		LOCATION OF CONFERENCE									
	ALL LOCATIONS	SYD 1	ADEL 2	MEL 3	PER 4	SYD 5	BRS 6	HOB 7	CAN 8	ADEL 9	MEL 10
Year (19..)	75-85	75	76	77	78	79	81	82	83	84	85
No. of Authors											
All up	1.67	1.56	1.48	1.44	1.94	1.30	1.67	1.72	1.67	1.70	2.19
From Sydney	.32	.19	.08	.07	.42	.67	.44	.33	.29	.11	.25
From Melbourne	.63	.75	.24	.89	.58	.42	.42	.69	.58	.63	1.28
From Adelaide	.14	.19	.36	.15	.23	.09	.11	.08	.09	.22	.0
From Perth	.10	.13	.32	0	.36	.02	.08	.06	0	.15	.06
From Canberra	.24	.19	.40	.30	.23	.09	.22	.22	.22	.22	.41
From Hobart	.02	0	0	0	0	0	.03	.06	.07	.04	0
From Darwin	.02	0	0	0	0	0	0	0	.11	.04	0
From Brisbane	.09	.13	0	0	.07	0	.28	.06	.20	.04	0
From Elsewhere	.07	0	.08	0	0	0	.08	.17	.16	.07	.06
On current organising committee (%)	6	0	12	11	16	0	11	3	0	7	9
On prior organising committee (%)	6	0	0	4	3	5	8	11	7	7	13
Composition of Papers											
No. of pages	21	28	30	20	24	16	18	20	19	21	18
No. of words in title	8.7	8.5	9.0	8.4	7.9	7.7	8.9	9.2	8.6	9.6	9.7
No. of tables	3.7	1.6	2.6	4.0	4.4	2.7	2.2	5.5	4.4	4.0	4.0
No. of figures	2.4	2.5	2.0	2.4	2.4	1.6	2.3	1.8	2.1	3.7	4.0
No. of sections	6.0	5.5	5.9	5.9	5.5	5.0	5 5	6.5	6.3	6.8	6.5
No. of references	12.7	13.6	8.8	14.4	9.7	14.7	9.8	14.8	14.1	11.1	13.8
No. of lines of Abstract	15.4	12.3	12.8	18.5	13.7	17.6	13.7	17.8	15.9	14 4	13.7
Industry of First Author (%)											
Academic	26	25	12	26	26	28	36	39	26	11	25
Federal Government	26	38	28	22	19	16	11	31	24	37	44
State-Local Government	23	13	40	22	29	28	28	8	20	26	13
Consultant	15	25	12	15	16	12	14	19	15	19	6
Student	1	0	0	0	0	5	0	0	2	0	0
Industry of Second Author (%)											
Academic	13	0	8	4	19	2	19	28	15	7	22
Federal Government	15	13	16	19	16	5	11	25	9	15	28
State-Local Government	12	6	20	4	19	5	14	3	18	11	13
Consultant	7	19	0	11	10	9	11	3	4	7	6
Student	1	6	0	0	0	0	0	3	2	0	0
Topic Area (%)											
Pricing	6	25	4	0	7	0	11	11	7	0	0
Demand	18	31	16	41	26	28	25	3	4	0	19
Investment	10	19	8	11	7	9	11	3	7	30	3
Pricing and Investment	7	19	4	4	10	2	3	19	9	0	0
Transport Management	21	6	0	26	16	30	11	11	22	37	38
Costing/Scheduling	6	0	16	0	7	2	8	0	7	11	3
Organisation Planning/Mgt	10	0	28	0	10	12	11	14	7	7	9
Transport planning in gen.	24	0	24	19	19	16	19	39	36	15	28
Modal Emphasis (%)											
Air/Airports	6	13	4	4	10	5	3	8	9	4	3
Bus/Coach	7	0	28	7	10	5	8	6	9	0	0
Rail	10	19	12	7	7	0	11	11	11	18	9
Car	9	6	4	19	0	14	6	22	6	0	13
Sea/Ports	6	0	0	11	7	0	6	0	6	19	9
Inter-Modal	10	25	12	4	19	16	14	8	2	4	3
Public Transport	9	6	0	11	10	16	14	6	7	4	6
Taxi	2	0	0	0	7	0	6	3	2	0	3
General	23	19	24	11	13	26	25	31	20	26	28
Truck	3	0	8	7	3	5	6	3	2	0	0
Pedestrian/Bicycle	2	0	4	7	3	2	0	0	2	0	0
Road	14	13	4	11	13	12	3	3	26	26	25
Commodity Group (%)											
Passenger Specific	53	50	60	56	68	67	58	58	46	22	44
Freight Specific	13	19	12	15	13	7	19	8	7	19	19
General	34	31	28	29	19	26	23	36	47	59	37
Location Specialisation,											
Urban	50	38	52	52	58	65	58	47	40	30	50
National	20	25	12	30	13	16	17	22	16	30	28
Interurban	6	19	8	7	10	5	11	3	2	0	0
Rural/Intrastate	9	6	8	0	3	7	3	14	20	7	6
Other/International	6	0	0	0	7	0	0	3	15	22	3
General	9	12	20	11	9	7	11	11	7	11	13
No. of papers	328	16	25	27	31	43	36	36	55	27	32

IABLE 2 RESIDENTIAL LOCATION OF AUTHORS

LOCATION	NUMBER	PERCENTAGE
Melbourne	211	38.57
Sydney	107	19.56
Canberra	81	14.81
Adelaide	47	8.59
Perth	34	6.23
Brisbane	30	5.48
Other	23	4.20
Hobart	7	1.28
Darwin	7	1.28
Total	547	100



IABLE 3 SOURCES OF INFLUENCE ON VARIAIIONS IN EMPHASIS DURING 1975 TO 1985

ACRONYMS:

Nxyz	= numbers of authors resident in location 'xyz'
Cxyzi	= ATRF number i held in location 'xyz'
CURRORG	= One or more authors on current organising committee
PRIORORG	= One or more authors on previous conference organising committees
NPAGES	= No. of pages of article in total
TITLWDS	= No. of words in title of paper
NTABLS	= No. of tables
NFIGURES	= No. of figures
NSECINS	= No. of sections (excluding references)
NREFS	= No. of references
NLINAB	= No. of lines of abstract
ACADEMICi	= Author i (= 1 for first, 2 for second) is an academic
FEDSi	= Author i is Federal public servant
STATSi	= Author i is State public servant
CONSULTi	= Author i is a consultant
STUDi	= Author i is a student
PRICE	= Theme is pricing
PRCINV	= Theme is pricing and investment
TRNSMA	= Theme is transport management
COST	= Theme is costing/scheduling
ORG	= Theme is organisational
TPLAN	= Theme is transport planning
DEMAND	= Theme is demand
INVEST	= Theme is investment
AIR	= Mode is air/airports
BUS	= Mode is bus/coach
RAIL	= Mode is rail
CAR	= Mode is car
SEA	= Mode is shipping/ports
INTM	= Inter-modal
PT	= Mode is public transport
TAXI	= Mode is taxi
TRCK	= Mode is truck
PED	= Mode is pedestrian
ROAD	= Roads
PASS	= Emphasis is on passengers
FRGT	= Emphasis is on freight
URBN	= Urban emphasis
NATL	= National emphasis
INTU	= Interurban emphasis
RURI	= Rural emphasis

TABLE 3 continued

THEME A: TOPIC AREA

TOPIC	SIGNIFICANT INFLUENCES
1. PRICING	CSYD1(+), NFIGURES(-), NHOB1(+)
2. DEMAND	CMELB3(+), NSECTNS(-), NFIGURES(+), STATS1(-), CCANB8(-),CADEL9(-), CHOB7(-)
3. INVESTMENT	CADEL9(+), NCANB(+), NLINAB(-)
4. PRICING & INVESTMENT	CHOB7(+), NBRSB(+), CSYD1(+), NPERTH(+), NSECINS(+)
5. TRANSPORT MANAGEMENT	ACADEMC1(-), CADEL2(-), CURRORG(-)
6. COSTING/SCHEDULING	CONSULT2(+), CADEL2(+), SEQORD(+)
7. ORGANISATION PLANNING/MANAGEMENT	CADEL2(+), FEDS1(-), NSECINS(+), NPAGES(-)
8. TRANSPORT PLANNING IN GENERAL	NREFS(+),CSYD1(-),CCANB8(+), CHOB7(+), CURRORG(+),NHOB1(-)

THEME B: MODAL EMPHASIS

1. AIR/AIRPORTS	NCANB(+)
2. BUS/COACH	CADEL2(+), NADEL(+), NBRSB(+)
3. RAIL	NPERTH(+), STATS2(+), CURRORG(-), CSYD5(-), CPER4(-)
4. CAR	CHOB7(+), NCANB(-), STATS1(-), CMELB3(+)
5. SEA/PORTS	CADEL9(+), NCANB(+), ACADEMC1(+)
6. INTER-MODAL	FEDS2(+), NCANB(-), CSYD1(+), CSYD5(+), CPER4(+)
7. PUBLIC TRANSPORT	FEDS1(-), SEQORD(+), CONSULT2(+)
8. TAXI	NHOBT(+), NDARWN(+), CPER4(+)
9. GENERAL	NCANB(+), NREFS(+), PRIORORG(+)
10. TRUCK	ACADEMC1(+), NPAGES(-), CADEL2(+)
11. PEDESTRIAN	CMELB3(+)
12. ROAD	CCANB8(+), CADEL9(+), NSYD(+)
13. PASSENGER	CADEL9(-), NCANB(-), CONSULT1(+), NPERTH(-), CCANB8(-), NTABLS(+)
14. FREIGHT	ACADEMC1(+)

THEME C: LOCATION SPECIALISATION

1. URBAN	NCANB(-), NPERTH(-), NDARWN(-), CADEL9(-), NFIGURES(+), NSYD(+), NADEL(+)
2. NATIONAL	NCANB(+), STATS1,(-), NREFS(-), CONSULT1(-), ACADEMC1(-)
3. INTERURBAN	NPERTH(+), CSYD1(+), NCANB(+), NBRSB(+)
4. RURAL/INTRASTATE	NDARWN(+), STATESPS1(+), CCANB8(+), CHOB7(+)
5. OTHER/INTERNATIONAL	CADEL9(+), CCANB8(+), NTABLS(+), NFIGURES(-) CONSULT2(+)

THEME D: SIZE AND COMPOSITION OF PAPERS

1. NPAGES	CADEL2(+), CSYD1(+), CPER4(+), CSYD5(-), TRCK(-) NADEL(-), FEDS1(+), OTHLOC(+)
2. TITLWDS	NDARWN(+), FEDS2(+), ACADEMC2(+)
3. NTABLS	FEDS1,(+), CHOB7(+), OTHLOC(+), PASS(+), BUS(-),CSYD1(-)
4. NFIGURES	NMELB(+), CADEL9(+), DEMAND(+), TRCK(-)
5. NSECINS	CSYD5(-), DEMAND(-), NMELB(+), NCANB(+), PRCINV(+), ORG(+), CADEL9(+)
6. NREFS	ACADEMC1(+), FEDS1(+), AIR(-), ORG(-), GEN(+)
7. NLINAB	CMELB3(+), CSYD5(+), CHOBI7(+), CCANB8(+), INVEST(-), PRCINV(-), NPERTH(+)

TABLE 4 BEHAVIOURAL INFLUENCES ON 'CHOICE' OF AIRF CONFERENCE

	MODEL 1		MODEL 2	
	Estimated Coefficient	Asymptotic t-value	Estimated Coefficient	Asymptotic t-value
Conference Specific Constants:				
Sydney (75)	1.681	1.73	-0.159	-0.44
Adelaide (76)	2.127	2.21	0.288	0.88
Melbourne (77)	2.204	2.30	0.365	1.13
Perth (78)	2.342	2.45	0.267	0.80
Sydney (79)	5.246	4.69	0.544	1.69
Brisbane (81)	3.157	3.22	0.491	1.53
Hobart (82)	2.158	2.23	0.652	2.11
Canberra (83)	2.916	3.07	1.076	3.68
Adelaide (84)	1.543	1.45	0.365	1.13
No. of words in Title:				
Sydney (75, 79)	-0.0729	-1.41	-	-
Melbourne (77, 85)	0.0917	1.67	-	-
Adelaide (76, 84)	0.0727	1.30	-	-
No. of Tables:				
Sydney (75, 79)	-0.0092	-0.16	-	-
Brisbane (81)	-0.1356	-2.14	-	-
Hobart (82)	0.0733	2.08	-	-
No. of Pages (75-79)	-0.1065	-3.32	-	-
No. of Figures (75,77,79,83,85)	0.1933	3.09	-	-
No. of Sections (75, 77, 79, 83, 85)	0.1497	1.35	-	-
No. of References (81)	-0.0236	-1.36	-	-
No. of Authors from:				
Sydney (75, 79)	-	-	0.634	3.23
Melbourne (77, 85)	-	-	0.518	3.29
Perth (78)	-	-	0.718	2.45
Brisbane (81)	-	-	0.685	2.35
One or more authors of Brisbane 81 on current organising committee (81)	-	-	0.812	1.30
One or more authors of Perth 78 on current organising committee (78)	-	-	1.167	1.93
Author(s) on prior organising committee (75,77,79,83,85)	-	-	0.850	1.41
Log-likelihood at Convergence $L(\beta)$	-713.82		-719.49	
Pseudo-R^2	.029		.022	
Sample Size	328		328	