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What is This?

FORECASTING 'PLANNING'

A. G. WILSON

Introduction

'Planning' consists of activities, and ultimately interventions in processes, carried out in order to achieve a set of goals. Planning in relation to developing patterns of urbanisation, urban planning for short, ultimately leads to interventions in urban devlopment processes for the greater public good. The Study Group on Developing Patterns of Urbanisation set up by the Centre for Environmental Studies is concerned with all aspects of the prncess of urbanisation. Urban planning clearly has an influence on the future and so any speculation about developing patterns must include a study of possible developments of the planning system, and the impact of any changes on the developing patterns. This can be seen as the problem of *forecasting 'planning'* itself. Such is the subject matter of this paper. It is hardly necessary to emphasise at the outset that such an attempt is bound to fail; any success will simply be the pointing out of issues related to the future of planning which need to be given more attention.

It is appropriate to set the scene with an abstract characterisation of planning activities, or tasks, similar to that presented in an earlier paper.[1] In this characterisation, there are three main types of planning tasks, concerned with *policy, design* and *analysis.* It is also useful to think of the entity which is being planned as a system, made up of many components. Then, policy activities can themselves be classified in three groups: *actions* which have some impact on the system being planned, which can arise from the operation of a control mechanism, or through the taking of firm decisions which determine, wholly or partly, the future of the system; *goal formulation*; and the *evaluation* of alternative plans to achieve goals. Policy makers and implementers may also be concerned with *monitoring* in various ways, to assess the impact and effectiveness of earlier actions. Design is concerned with the techniques of plan formulation and presentation, and with the use of a variety of design methods to generate alternative plans. (A 'plan' has been implicitly defined as the specification of the action (to be) taken in relation to the system being planned.) Analysis is concerned with understanding the system of interest so that the impact of plans on the system can be predicted to the greatest possible extent. Policy, design and analysis activities in planning processes are closely inter-related and sometimes overlap. It is recognised, of course, that this is only one of many ways of usefully characterising planning processes. For this paper, such an abstract characterisation is especially useful in struc-

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turing a review of developing planning capability—the new methods which are becoming available to the planner in each of the three main fields of activity. In the end, of course, it proves necessary to return to a more concrete characterisation of planning processes in order to discuss possible developments of existing planning frameworks.

As a further preliminary, it may be worth briefly relating this structuring of planning processes (which rather takes it for granted, implicitly, that planning is necessary and useful) to an alternative analysis, presented in a second paper.[2] The task of planning in relation to a system as complex as a city or a region can be viewed as the problem of the optimal control of such a system. There is in principle an infinitely large number of 'states' which such a system of interest can be in, and it is a requirement for rational and consistent decision-making that the decision-maker should possess a preference ordering over these states. The alternative analysis arises from viewing the urban system as at least in part an economic system, and then drawing on the body of economists' experience in the control of such systems.

The urban system is, in part, a set of markets, and economic theory shows that, under certain stringent conditions mainly related to competitiveness, market systems will follow paths which are Pareto optimal—that is, there is no reallocation of resources that could make anyone better off without making anyone else worse off. So, a part of the optimal control problem is then to ensure that urban markets satisfy the appropriate conditions to guarantee Pareto optimality. Such a system state may be called one of allocational efficiency—resources are allocated in an efficient way.

There are two main reasons why planning interventions are needed over and above those which maintain conditions for efficiency in markets. Firstly, there is the problem of achieving *distributional efficiency*. There are many possible allocationally efficient states, each corresponding to different distributions of real income. The problem of achieving distributional efficiency is that of achieving the distribution of real income which society, in some sense, wants. Secondly, there are two kinds of *market failure* which can only be corrected by intervention. The first of these arises from indivisibilities, or more generally, increasing returns to scale, in the provision of a good. The second arises from the existence of economic externalities. The first type of failure can be tackled by public regulation and control, usually by ensuring that marginal cost prices are charged, with investments being made out of public funds; and the second type is tackled by applying taxes and subsidies so that market prices reflect social costs.

The three kinds of intervention needed, to achieve distributional efficiency, and to tackle the principal market failures, can be related to the characterisation of the planning process presented earlier. Firstly, income distributional effects can only be measured if the planner has adequate analytic capability to measure the distributional impacts of alternative plans, and in the policy making process, these impacts must be related to the current knowledge about society's goals. Secondly, investment policies in

relation to public goods also need an analytic or predictive capability, and will be determined by the policy-makers' evaluation criteria. Thirdly, the policy maker, in assessing his response to externalities, also needs the analytic capability to measure the externalities associated with particular parts of his plans.

Thus, a clear need emerges for a substantial analytic capability—to understand cities and regions in order to assess the impacts of alternatives at a level of detail which provides information about the incidence of changes in real income. Attention is also drawn to the notion of planning as a goal achievement process which cannot be fully tackled with the tools of economics. Design capability is needed to get an enumeration of possible states—if the best is to be selected, it must be one of the alternatives to be evaluated! Further, the complexities of policy making tasks are increasingly self evident. It is also clear that the three kinds of planning activity stand in a hierarchical relationship to each other: analytic capability is a necessary prerequisite for both designer and policy maker, and design capability is also a necessary prerequisite for the policy maker.

The rest of this paper is divided into two parts. The next part is concerned with planning capability, particularly in relation to new and improving methodologies. For this purpose, it is useful to retain the abstract characterisation of planning processes presented in this introduction. Thus, successive sub-sections discuss analytic capability, design capability and policy-making capability. In a final sub-section, a portrait is presented of the working methods of an idealised planning team using a range of new techniques.

The final section of the paper, discusses how the developing planning capability could be applied. For this purpose, it is necessary to abandon the abstract characterisations of planning processes, or at least to relate them to institutional practice. Thus, the first sub-section of this part is concerned with the institutions of planning. The second sub-section attempts to set out some of the major issues which are arising and which will arise in the development of planning processes, paying particular attention to the relationship between the planners and the planned (or the consumers of planning). This final section takes its overall title from this topic, which was identified as one of the major subjects for future concern by the Centre's Study Group. Finally, a number of tentative conclusions are drawn in the third sub-section.

It is appropriate to close this introduction with a note about the methods which are employed in this paper, and to request the reader's indulgence and forebearance. It is clear that the field to be covered in the paper is immense, and to do it justice would require several authors with a variety of skills to work for several years and to publish their results in several books! The author has adopted different tactics in the different parts of the paper. This introduction attempts to set down in broad terms a characterisation of planning processes for use in the rest of the paper. A more detailed discussion is available in the two papers already cited. In the second section new methods which contribute to increasing planning capability are

reviewed in broad terms. It is not possible in the space available to give detailed references, but an attempt has been made to cite works which· themselves have an extensive bibliography. Thus the reader who is not familiar with the material described should be able to gain access to the literature at least indirectly. The discussion of issues and possible developments in the final section is based on an extremely rudimentary analysis of existing institutions in planning. This basis should be formed from extensive survey and study of a vast amount of literature from most branches of the social sciences, especially political science, social administration and sociology. Such a method of working, in this case, has not been possible. Thus, the concepts introduced and used in the final section may occasionally fall short in relation to standards of rigour and precision which the social scientist might apply. Nevertheless, it is hoped that they are adequate to support a discussion of issues and possible developments as these are of such urgency as to need as much airing as possible as soon as possible. Thus, the issues and possible developments discussed in the final section arise from the review of methodological developments in the second, and from a study, albeit cursory, of institutional frameworks in planning in the first sub-section.

This can be put another way. It is assumed that the reader has an interest in, and probably a considerable amount of knowledge of, both developing methodologies in planning (2nd section) and current institutional and political frameworks (3rd section). It is further assumed that the reader with more specialist interests is aware of the issues and questions associated with particular topics. Thus, the purpose of this paper is to study basic underlying subject matter only in sufficient detail to identify a set of major issues about the overall form of planning in the future and to contribute to a discussion of the main alternatives. In relation to more detailed questions, it assumes knowledge on the part of the reader, or alternatively provides an initial introduction for the reader to the relevant literature.

Planning capability

Analytic capability

In the introduction, a need was identified for a powerful analytic capability. Planning involves intervention to achieve goals, and the good planner will design his intervention on the basis of *predictions* of the impacts (which are often felt over a long time period) of his designs. To be able to predict, he needs a good understanding of how urban systems work, and this is what is meant by analytic capability. From a different viewpoint, the principal motive of the planner may be to intervene to solve problems. Again, it can easily be seen that he needs the same analytic capability.

There are two possible approaches to analysis: a first-principles-what-do-we-need-to-know approach, or an investigation of what the various disciplines have contributed to urban studies. These are pursued in turn.

Disciplines can be seen as coalitions of people using particular sets of concepts. As concepts, and theories relating concepts, become refined over time, and as concepts become more or less useful, then the boundaries of these coalitions can change. This has interesting implications for a relatively new field such as urban studies. The first-principles approach studies concepts relevant to particular problems (not represented in single disciplines, such as urban studies and urban planning), and only secondly consider the disciplinary implications.

The first-principles approach is to some extent formalised in what might itself be called a discipline—that of *systems analysis*. This emphasises the need to identify all the components of the system of interest, to consider various ways of grouping the components into (sub) systems and to study behaviour and interaction within and between systems. The main components of urban systems can be classified as objects (especially, people, who are mobile, and physical infrastructure, which is immobile) and activities (especially social, economic and governmental activities); *interactions* take place through what can be called a *communication* sector. There is an initial *taxonomic problem*: to classify the components and systems which have been identified. Then there is the *theory building problem*: to explain and understand the structure and process of development of the components and subsystems. Interactions can be studied in a consistent way by the use of *accounting* procedures. This outline sketch of the first-principles approach will perhaps suffice as a framework for estimating the likely development of the analytic capability of planners. A more extensive discussion is given in other papers by the author.[3, 4]

Ultimately, most disciplines contribute to urban studies. Perhaps the most fundamental disciplines associated with the analysis of cities and regions are demography, sociology, political science, economics, geography and engineering (in so far as it is concerned with the mechanics of operation, and not with design). As professional disciplines, planning, architecture and the other part of engineering contribute mainly to the design and policy aspects of planning processes. The fundamental disciplines contribute tremendously to urban analysis, though the development of approaches such as systems analysis often ensure that research is carried out in multi-disciplinary teams. It should be noted, however, following Mackenzie,[5] that it is often better to erode and extend disciplinary boundaries than to form inter-disciplinary teams: '...the best work is being done not by inter-disciplinary teamwork, but in disregard of traditional frontiers.' In other words, important research can be expected both from multi-disciplinary teams and by imaginative disciplinary work. For the purpose of this review, it will be convenient to adopt the first principles' (systems analysis) approach, and to study progress in relation to developing understanding of the main components of urban systems.

The main task of this section remains to review progress in the field of analysis and to assess likely future analytic capability. The first point to note is that within and beyond disciplines, and in inter-disciplinary teams, there are different styles of research. These range from an essentially

inductive approach relying mainly on statistical analysis of data to an essentially deductive approach based on theory building, and comparing theoretical prediction with observation. Many possible hybrid styles can and will emerge, such as the development of mathematical equations which fit data reasonably well, which are theories with a relatively low explanatory power. Much of econometric analysis is of this style. Statistical analysis will support theory building and vice versa. A useful framework within which to assess and predict progress is provided by reviews of *models* of urban systems. A model is a formal representation of a theory, and a model can be tested and made operational for planning purposes if it can be checked against data and all its parameters can be estimated. Present progress is reviewed in two papers by the author which have already been cited,[1, 4] and in papers by Harris[6] and Lowry.[7] There are useful collections of papers in a special issue of the *Journal of the American Institute of Planners*[8] and a more recent Special Report of the Highways Research Board.[9] References on particular models will not be cited in this paper, though further review papers will be cited.

We can now briefly review the progress made so far, and use this as a basis to speculate about the future. Firstly, let us consider spatially aggregated models of population and economic structure. Good matrix models[10] exist for forecasting population structure by age and sex for any large area unit, and these models can be applied at national, regional and urban levels of aggregation subject to assumptions about birth rates and migration rates. Variations in birth rates are relatively badly understood, and it is customary to make projections using ranges of assumptions. Some work has been done on models of migration, however. More difficult problems arise, even at this level of aggregation, in order to understand "structure" in any greater detail. For example, it is necessary to know about occupation structure, so that it is possible to match, at least roughly, the provision of skills from the educational system to available jobs, or vice versa, according to what our goals are. (It is unlikely to be a plank of a planning platform that these totals should not match at national, regional and urban levels, but it is less clear whether social or economic requirements should call the tune—and example of conflicting goals.)

Economic models at the spatially aggregated levels can also be constructed using, for example, input-output techniques.[11] At the national level, models are in use in some countries and considerable progress has been made in Britain. At the regional and urban levels, the area can be treated methodologically as a 'country', or it can be treated as a part of an inter-regional system. The first alternative is the simplest (though of course it offers less information) and some operational models of this type exist; the second is more difficult because there is rarely much available data on inter-regional flows to calibrate a model, though a considerable amount of theoretical work has been done. Thus, at the spatially aggregated level, at least the beginnings of good models exist, though more empirically based work needs to be done.

Models in the field of intra-urban structure are much less advanced, and

the problems of model building are correspondingly more difficult than at the spatially aggregated level. The only model which is anything like adequate is the transport model.[12] Mathematical models of urban transport flows have been used in many planning studies, including those being carried out in all the major conurbations of Britain. These are the only intra-urban models at present being used continuously by planners. Attempts to model urban systems vary from being comprehensive in scope to being very partial. At present, the price which is paid for comprehensiveness is loss of detail. Models of the retail sector[13] are being built with increasing success, and are now being used by some planners for work on planning new retail centres. The residential and workplace location fields have proved more difficult. Rudimentary models exist but a better understanding is needed of certain fundamentals, such as individual preference structures, before much more progress can be made. For similar reasons, the whole social sector is very difficult to handle; the provision of urban public services and social facilities have been dealt with according to 'need' and various rules of thumb adopted by the agencies who are responsible for their provision. (And this is much less than half the story: much of the success of social provision will be the returns measured by individual utility functions if we get everything else right; that is, a large part of a social success will be determined by achieving the best provisions of residence and workplace.) Considerable progress has been made in the understanding of the social structure of the population, however. Some progress has been made with industrial location models on the theoretical side,[14] but this has been taken a relatively little way on the empirical side, mainly because the kind of data demanded by the theories is not easily available. At the intra-urban level, the usual measure of economic activity in the models discussed so far is jobs. It is important also to be able to develop models of the distribution of infrastructure, and this is perhaps the most difficult modelling sector of all, mainly because buildings have long lives and can change their use many times during their lifetimes. A considerable amount of effort has gone into studies of the service and commercial sectors, some of which is now coming to fruition. This sector does illustrate the sort of classification problems which sometimes arise, however: we are often interested in offices per se, and useful studies have been carried out on offices. However, this, as a sector, is a compendium of parts of almost all the other economic activity sectors. This illustrates again that there is probably no way (except at an impossibly fine level of disaggregation) of classifying activities so that any *type* of activity which could be of interest falls clearly into one sector.

There are various ways in which we can speculate about likely progress. Let us first consider progress in relation to the styles of research discussed earlier, ranging from the deductive/theoretical to the inductive/statistical. The first point to note is that there will be progress, and there will be a shift: there will be theories about subject areas which are today susceptible to statistical analysis only, but there will also be new subject areas which move in to fill the gaps in the statistical-analysis only category. Issues of

interest have an unhappy knack of shifting towards problems where one's
analytical capability is deficient.

The present position could be summarised by a statement saying that
very few subject areas of interest are covered by adequate theories, some
can be described by sets of mathematical equations and good classification
systems, and most are susceptible to statistical analysis though, in many
subject areas, the data are very poor. Each of these situations will improve.
There should be a theoretical understanding of the main location subject
areas: residential location, industrial location and retail location. A good
theoretical understanding would imply that at least the broad outline of the
preference structures or utility functions of individuals in each of these
sectors would be known. This will be of crucial importance for improving
problem solving capability. At a more aggregated level, but at a level which
remains useful for many planning purposes, there should be good mathe-
matical descriptions of development phenomena, at least as accurate as
models of transport flows at present. The better and more detailed theories
which will develop will serve to refine these, and they will also facilitate
evaluation of alternative plans since, when preference structures are
understood, it will be possible to measure benefits arising from plans.
Statistical analyses should be facilitated by the existence of computerised
data banks and more easily available statistical analysis programmes of the
most advanced kind.

Of course, it must be recognised that the models which are currently
available are not very accurate predictors, especially over long periods.
The level of accuracy should improve for conditional prediction, but it is
important to recognise that a high error level will persist, more in some
sectors than others. This will represent one contribution to the planner's
uncertainty when he makes his forecasts. It does not mean, of course, that
the models are useless; the alternative of not using models simply means
that the planner relies on his intuitions, which in most cases would give
rise to even greater uncertainties. What it does mean is that uncertainties
should be explicitly recognised and accounted for in the planning process,
using such techniques as statistical decision theory.

To summarise: theoretical and statistical developments will stimulate
and follow each other. We shall begin to solve classification problems on
the one hand, and the development of operational information systems,
such as co-ordinate referencing systems, for storing many kinds of spatial
data, will be available on the other. The solution to the classification
problems will also facilitate theoretical advance in a more direct way: it
will enable sub models to interact and communicate with each other more
easily than at present, possibly through an accounting framework.

Design capability

What is design? Alexander[15] defines design when he writes: 'The
ultimate object of design is form . . . every design problem begins with an
effort to achieve fitness between two quantities: the form in question and

its context.' This can be put another way: the 'form' can be taken to mean the form of the city, socio-economic as well as physical, and the 'context' the goals to be achieved, and so design is "finding forms which achieve goals in the best way". In terms of the use of models, this design, a specification of the form, is an assignment of specific values by the planner to those variables which he can control. Alexander goes on to point out the seeming impossibility of achieving good designs in a self-conscious culture where the possible number of forms, because of the number of possible combinations of the components, is astronomical. Thus, consider the simple example of designing a transport network: there are an enormous number of possible ways of connecting nodes with links, and of defining the characteristics (such as road widths) of each link. This is a typical combinatorial problem which arises in design, and the large numbers involved means that the designer cannot find the best design by simple enumeration of alternatives with an analysis of each to find the best. The way out of the dilemma is to seek a number of organising concepts to reduce the dimensions of the problem. Thus it has been argued, in the case of the example of designing a transport network, that there are only three basic forms: the grid, the directional grid, and the centripetal radial system, for an urban area.[16] This may or may not be seen, ultimately, to be an over-simplification, but it can be seen how this simplifies the problem: the only *sensible* combinations of links to examine are those which form one of the three patterns, and design then becomes a matter of thinking about spacing of parallel links or radials, in relation to land use. To test the alternatives, the models outlined in the previous section will have to be used to test the impacts of various designs and the alternatives can be analysed using an evaluation procedure which will discover which design(s) come(s) nearest to meeting the goals. It is clear even from this very sketchy outline that design is always likely to be an evolving process and that there will perhaps never be 'final' answers to design problems. This is partly because goals will be continually evolving, and the designer will have to take account of technological change, but also because of the essential element of inventiveness in design: the urban design process is so complex that it will be possible in the indefinite future (especially since the context is continually changing anyway) for people to invent new organising concepts which would have a major impact on design, and hence on developing patterns.

Thus, to summarise: the designer uses a mixture of understanding (and hence prediction) and imagination to build organising concepts for design, and then he generates good alternative designs to achieve policy goals. The alternative designs are compared using some evaluation process (and the criteria used are themselves part of the policy area—a function of the goals adopted). In cases where this process could be fully formalised (which means that, literally, where nothing is left to the imagination!) some optimising procedure could be used to produce the best plan, but the cases which arise in urban planning are unlikely to be sufficiently simple for this method to be applicable. Above all, it should be emphasised that in

a context of shifting goals, and increasing understanding, the designer will be continually learning.

Policy making capability

The policy making part of planning contains three inter-related elements: firstly, the tasks of implementation and control, secondly, the task of goal formulation, and thirdly, the decision taking role of selecting a plan from a number of alternatives according to appropriate criteria.

Policy making capability relates in an obvious way to analytic and design capabilities: in the end, analysis will have to say enough about preference structures for the policy maker to be able to evaluate correctly; and a good plan can be chosen only if designers have a good plan among the alternatives they produce. The assumption will be made for the present that no special problems are presented by implementation and control. This leaves us with the task of exploring in more detail the problems of goal formulation.

It is a crucial element of policy making that goals should be precisely articulated and the subject of public debate. It could be argued that it might not be in the interests of some community groups to make goals public, but a number of currently developing techniques do contribute and force a trend towards explicitness. In particular, the development of planning, programming and budgeting (P.P.B.) systems explicitly relates the contribution of inputs to various outputs, and these outputs are (at least approximately) explicit statements of goals. In a field such as urban planning, all goals cannot be made explicit and measurable, but procedures which are equivalent to those used in P.P.B. Systems are being developed. Examples are Lichfield's planning balance sheet[17] and Hill's goals—achievement matrix.[18]

Increasing analytic and design capabilities give considerable scope for extending the nature of plans themselves. Plans can cover several time horizons (and a wider range of functions) with all the appropriate inter-actions incorporated in the planning machinery. It is then possible to distinguish between short run and long run plans (and hence, using terms from other branches of planning and operational research, between tactics and strategy). It becomes possible to measure flexibility: to what extent does a decision about the short term contribute to the 'firming up' of the long term strategy. Further, these developments relate in an obvious way to goal formulation and enable exploration of the latter concept in more depth. One can distinguish, for example, between short term goals (more specific, and perhaps called targets) and longer term goals aimed at various time horizons. Thus, it should be possible in the not too distant future to integrate policy making capabilities over different time horizons. Statistical decision theory can be used to help take account of uncertainties, as mentioned earlier.

Problem solving can often be related to policy making in one obvious way: a 'goal' may be 'to solve a problem'. However, it may not always be possible to make such an identification without a lot of analysis. In particu-

lar, the planner will sometimes have to employ his analytic capability as a diagnostician.

Finally, note that it has been implicit throughout this section, that the planner will rarely have an optimising capability. His task is to use various techniques to find good solutions to problems, to devise good policies. The situation will usually be too complex to lend itself to optimisation procedures in the manner, for example, of the planning of some industrial processes.

Portrait of a future planning team

As an example, consider the workings of a local planning authority in the year 1980. It will be a large authority, brought about through local government reorganisation a few years earlier; suppose that it is a metropolitan authority, but sub-regional, and so it has relations with other tiers of government at regional and national levels. Firstly, consider the facilities which are available to these new planners. It is unlikely that the authority will have its own computer; its computing equipment is likely to consist of terminal equipment only which hooks into some national computing grid, and which supplies it with virtually unlimited (and cheap) computing facilities. The nationally provided facilities will consist of software as well as hardware which means that extensive packages of computer programmes, which facilitate data collection and monitoring, and which contain all the basic models, will be available.

Many of the authority's goals will be specified as output targets in something like programme budgeting procedures; programmes (or plans) specifying these targets (and other related actions) will be available, and planning work will consist of rolling them forward for different time horizons. Planning for the longer term time horizons (15, 25 and 35 years) will create possibilities just as wide and exciting as those of today; it would be wrong to suggest that this sort of planning would become anything like routine. The targets, at the different time horizons, would have specific degrees of 'firmness'; each target might be expressed as a range of possible values and a probability distribution be associated with each range. Paths to each possible target value (and there would be many for each value) would also be specified and analysed through the techniques of statistical decision theory; a continual monitoring procedure would indicate which path was at present being followed. The paths themselves (and the possible future paths) would be subject to continuous amendment as the planners' knowledge of the system increased through time, and the underlying models were improved and as society's goals changed and evolved.

The technical aids available to the designers in the planning team would be considerable. They would be designing city structure in what amounted to an experimental lab situation, and alternatives could be examined at great speed. The designers of a transport network for example, would be able to sit at a map and draw on links of different transport modes and different travel characteristics with a light pencil linked to a computer,

and instant computer output, produced via a model system, would say what the impact of the design was, how it related to the targets and forecasts specified (by their probability distributions) by other planners in the department, whether it was 'better' than any previous effort and if so how, and so on.

There would be corresponding teams of planners with similar facilities at regional and national government levels, each upper tier constraining lower tiers by fixing (possibly probabilistically) quantities to satisfy national or regional goals (which had been negotiated with lower tier interests). It could also be that some scale economies were achieved by the upper tiers of government providing the teams to do much of the research work on the model system, then used by all through the computer network. The facilities which have been outlined would also be available to various community groups who would themselves be employing professional resources in complex public participation procedures.

The striking thing about the predictions of this section, aimed at 1980, is that many, if not most of them, are technologically possible now. The main weakness at present would be in the model system, but even in that case, a rudimentary system would be available which would be good enough to begin this kind of planning framework. Indeed, it may be that this kind of planning framework is necessary to the rapid development of appropriate models. It is interesting to see that some local authorities are already beginning to set up the beginning of planning systems of the kind outlined here.[19]

The planners and the planned

Institutional frameworks

It is now necessary to study institutions in more concrete terms. It is possible, as a first approximation, to consider separately the institutions of the planners and those of the planned. This will facilitate a discussion on the development of the interaction between the planners and the planned— one of the major issues to be aired in this paper.

In order to classify in general terms the types of institutions associated with planning, four basic dimensions can be distinguished:

> i) type of activity
> ii) functional responsibility
> iii) geographic scale of responsibility
> iv) nature of public responsibility

'Type of activity' covers two basic classes, one of which can be further subdivided. The first is activity associated with the implementation of plans (executive agencies), and the second that associated with innovation in planning technique. The latter class can be subdivided into strictly *research* activity, as distinguished from *developmental* activity (making research discoveries operational for use in executive agencies). Each group

could be further subdivided into responsibility for policy, design and analysis aspects of planning.

'Functional responsibility' refers to the particular functions of the urban system which an institution is responsible for. This responsibility may be broad (say, 'city planning' covering many urban functions) or quite specific and narrow (as with a public transport authority responsible for one mode within the transport sector).

'Geographical scale of responsibility' can be defined in areal terms, and considerable variety is possible, from international to very local.

To define 'nature of public responsibility', at least three groups can be distinguished which can be called governmental, public and private. An institution will be governmental if it is responsible for taking or imple- menting planning decisions in the public interest; it will be public if it is not directly concerned with decisions, but is none-the-less in some sense under public control; it will be considered private otherwise, which implies control by an individual, or small group, not responsible to the public at large.

It is appreciated that these categories are not always precisely defined, but they will suffice for present purposes. The four categories generate an infinite variety of type of institution arising from the variety of mixes of type of activity, functional responsibilities and degree of public responsi- bility at a variety of possible geographic scales.

The institutions of the planned are included in the 'private' sector of the above classification. Each individual or household is in a sense an institution. Such units take a variety of decisions (such as location decisions), which are often heavily influenced by the planning system, and which, in the end, determine much of the shape of the patterns of urban development. Further, nearly all organisations of individuals, such as firms, are similarly consumers of planning. Individuals, households and organisations are thus the main client of planners. The final group could involve ad hoc pressure groups specifically formed to discuss planning matters. There are, in addition, institutions of interaction between the planners and the planned— in essence the entire political structure, but including ad hoc institutions such as Commissions and Inquiries.

Any categorisation of institutions of the above type must, of course, be an over-simplification. It is beyond the scope of this paper to pursue an analysis in more depth, but it is perhaps worth noting a number of ways in which the analysis should be expanded. Firstly, for all kinds of institution, a well known, but important distinction should be noted, which is well stated by Mackenzie[5]: '... one must admit into the discussion the awkward distinction between "formal" and "informal" organisation.' In other words, when institutions or organisations are analysed by political scientists, the actual behaviour is often found to be different than would be expected on the basis of the formal constitution, and so it will be important in analysing the role of institutions in planning to study informal as well as formal operations. Much careful research has been carried out on this topic. For example, Meyerson and Banfield,[20] in a now classical study, have

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described a conceptual framework to study political processes associated with public housing decisions in Chicago; Griffiths[21] has made a detailed study of the relationships between central and local government, in a general context, but including a study of urban planning matters; more generally, Maass[22] has constructed a detailed model of the constitutional democratic state; Levin,[23] in Britain, has tackled a similar analytic problem from a different viewpoint, by analysing how decisions are actually made in urban planning; Friend and Jessop,[24] in a recent book, present a detailed case study of planning processes in Coventry. It will obviously only be possible to begin to resolve some of the issues raised in this paper through detailed analytic work of this kind.

It is even an over-simplification to assume that it is sufficient to categorise institutions and to go on to discuss the roles of particular types of institutions. Stringer[25] has introduced the concept of multi-organisations as those parts of several organisations which play a role, formally or informally, in a common decision field. He argues, as discussed by Friend,[26] that the most striking practical successes of operational research to date have been within the setting of a single organisation, but that if operational research is to make a comparable impact on the processes of public planning, then conscious steps must be taken to adapt its approach to the special problems created by decision processes which impinge on the responsibilities of several organisations. Further, it is also useful to take into account what are in effect special kinds of formal multi-organisations—Commissions (super-institutions) or similar organisations, which are being set up almost continually to review forms of institutions and their appropriateness for the current period.

Issues

It will by now be clear to the reader that the issues to be raised in this paper are issues *about* urban planning, as distinct from issues *within* urban planning. (It is essentially a paper in the field of meta-planning as distinct from planning, in the same way as one enters the field of meta-mathematics to discuss issues about mathematics.[27]) Issues within planning are extensively discussed in the other papers of this special issue. It has been shown that the planner *professionally* has a developing and increasing capability; he can analyse and predict increasingly effectively, and he is becoming a more self-conscious (following Alexander[15]) and effective designer. He has improved tools for policy making. However, all this stops short of more effective policy-making! If urban planning is about *society achieving it goals*, then the main issue about planning is whether the professional planner can link with society sufficiently effectively to ensure that it is society's goals which are being achieved, and not his own. It is, of course, an over-simplification to maintain this distinction between the (professional) planner and the planned. Another way of stating the issue is whether society can plan for its overall ends effectively. However, the distinction between planner and planned is convenient for the purposes

of this paper and will be retained. The main issue about planning, linking the planner and the planned, can then be subdivided into issues about

    i) goals
    ii) conflict resolution
    iii) communication
    iv) public participation

These are all issues about the workings of *democracy*. It is taken as read that within urban planning, capabilities will be developed to be as *efficient* as possible. The four sets of issues are closely interrelated, but it is convenient to begin by discussing them separately.

It is perhaps best to begin discussing goals with the conjecture that planners at present are rather ineffective in articulating society's goals as distinct from their own ideas about society's goals. Crick[28] expresses this in writing about planners as follows: 'They are our sort, particularly dangerous, sometimes almost disgusting, in a propensity not merely to know what is best for ordinary people, but to say that this is what ordinary people want.' It is necessary to find systematic ways of finding what society, as individuals and collectively in groups of various kinds, wants: from within the political framework (voting), by listening to shouts (pressure groups, market research) and, most effectively of all, observing what people do in circumstances where they have choices (in markets and through various kinds of revealed preferences).

It is possible to distinguish between goals for individuals and community groups on the one hand, and a group of economic units on the other. This represents a distinction between the social lives of individuals and groups living within an economic environment, and the units which create income and wealth in the latter environment. The community has obvious needs for workplaces, residences, shops, social facilities and a variety of public services, many of these being linked through a communications sector, and goals could be articulated, at least in broad terms, in relation to these needs. Economic units, at the present time, often appear to have growth as the critical goal. The implications of this can be articulated in various ways.

Of course, not all of the goods and services required by society are publicly provided. Indeed, one important question in relation to goals is the extent to which goods and services can be or should be provided through private market mechanisms, and to what extent through public planning. This issue was discussed in broad terms in the first part of this paper. More specifically, it appears that planning requires an increasing amount of information about individuals and organisations, both in the drive for greater efficiency and in order to be able to calculate the detailed incidence of the impacts of plans, than has been necessary or possible hitherto. This in itself is sometimes considered to be a major issue as a possible infringement of privacy or freedom. This issue is explored in some depth in a paper by Michael.[29] For example: 'Complementary pressures from those who would use information about the private person are likely to be great.

The real or imagined need to use people efficiently will increase as more organisations find themselves in the throes of complicated and disrupting reorganisations, remodelling people and procedures to meet requirements imposed by the use of automation and computers. Thus, executives and decision makers, responding to emotional and practical pressures, will try to squeeze the utmost from available personal information as clues to efficient job assignments.' This is written about privacy with respect to employees in firms. However, it does not need too great a stretch of the imagination to see the 'executives' as the planners, and the firm as the city. In other words, there will be considerable pressure merely as a result of the existence of new methods, on individuals, both on their privacy (and in particular on their private goals) and on their range of opportunities. Planning which threatens privacy is often also considered to threaten freedom. The issue now is: whose freedom? The 'freedom' of one individual (or indeed the privacy) often threatens the 'freedom' (or privacy) of others—consider, for example, the 'freedom' to drink and drive. This, then, all relates to the first issue about the determination of societal goals, but offers a further pointed example that goal formulation will almost inevitably generate conflicts.

It is clear in a general sense that the more planners can help society to articulate its goals, the more evident will be the conflicts between different sectors of society. And, of course, the institutions which play roles in the articulation of goals, will also inevitably play major roles in the resolution of conflicts. At present, goal articulation is imprecise and, along with the tasks of conflict resolution, is largely carried out within political institutions as they now exist. The next and final section of this paper will take up the question again in relation to possible developments.

Problem of goal articulation and conflict resolution each raise issues of communication, especially between planners and planned. This raises issues associated with language and general availability of information. If planners are, for example, using the language of mathematical modelling, it is important that the resulting information can be communicated to the planned. This can be achieved in one or both of two ways in different circumstances: either by making a simplified presentation of results if nothing is lost by this, and/or by ensuring that experts are also available to the planned. An even more important point is the need to make all relevant information about planning issues available to the planned as well as within planning teams. There is a tendency at present for governmental agencies to use expert advice in forming decisions or plans, but then *not* to make this expert advice generally available in any public debate which follows.

This all leads naturally to the issue of public participation in planning. It is clear from the above discussion that effective public participation means creating an institutional framework which ensures the articulation of society's goals, and the provision of machinery for effective communication and conflict resolution. It is equally clear, even from this outline sketch of the complexity of these tasks, that effective public participation needs more than a series of public meetings (which tends to be the only

accepted implication of the phrase in Britain), and also more than advocacy planning[30] (one of the steps towards public participation in the United States).

Some possible institutional developments which might help resolve some of these issues are discussed in the next and final section.

Possible developments for planning

Two related streams of development in planning have been discussed in this paper: the first relates to increasing planning capability in a technical sense and is concerned primarily with *efficiency*, the second to public participation, and is concerned primarily with *democratising* planning. It could be argued that the second stream is related to the first: that the existence of a deeper knowledge and understanding of how urban systems function coupled with an increasing capability to plan such systems inevitably becomes public knowledge and so moves more firmly into the political arena with corresponding demands for more public participation then hitherto. It may be possible to trace a connection between the development and use of mathematical models of urban systems and the student riots!

The key to possible developments in planning lies in the possible developments of institutions associated with planning. A number of obvious points can be made in relation to the types of institution already categorised. There is likely to be an ever increasing drive for more planning capability. Thus, in the long run, more professional planning effort is likely to develop in a number of different kinds of planning institutions. The numbers of professionals concerned with implementation and control substantially exceeds those involved in development and they in turn substantially exceed those in research. For example, many people are involved in the implementation of transportation engineering schemes in cities (typically in local government), a substantial number, but considerably fewer in the practical development of new transportation planning techniques (typically in firms of consultants or in central government) and even fewer in research (typically in universities and specialist institutes). These numbers are all likely to increase in absolute terms, but relatively more new effort should develop in research and development if the trend in urban planning follows trends in other fields. It is important to recognise that development work does use up more resources than the related research work; one of the evident weaknesses in urban planning at present is a relative lack of resources in development.

In terms of functional responsibility, institutions at present tend to be concerned with transport modes, housing, land use, health, education, and so on. As awareness of the strong inter-relationships between functionally-defined sectors increases, there is a strong trend to merge to form units with wider responsibilities. A similar point can be made about geographical scale or responsibility: there is a trend towards bigger areas units because of the strong interactions and spillover effects crossing many existing

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administrative boundaries. One recent example which illustrates both
trends is the creation of Passenger Transport Authorities by the Ministry of
Transport in Britain. These have extended functional responsibilities in
having to plan for several transport modes, and cover a wider geographical
area so that conurbations can be planned as integral units. Many other
examples could be cited to bear out both trends.

The fourth institutional category defined nature of public responsibility.
The analysis of this paper suggests that both public and private institutions
will grow and develop to facilitate public participation in planning. Some
existing institutions, such as universities, may contribute in such roles.
For example, if a governmental agency has carried out a transportation
study using mathematical models, then one or two local universities may
work with the same or similar models and data which would fulfil some of
their own educational and research functions, as well as helping the com-
munity to check and extend the governmental work.

With this background of obvious possible trends, it is now appropriate
to discuss more systematically the *requisite variety* of institutions associated
with urban planning. It has already been noted that a tremendous variety
of institutions exists. This notion can be developed: urban systems are
extremely complex and the whole planning system (including the institu-
tions of the planned as well as the planners, to allow for public participa-
tion) aims to control this complex system. The theory of control in complex
systems is studied in cybernetics, and cyberneticians, such as Ross Ashby,[31]
state a law of requisite variety which, roughly interpreted, means that a
control system must be as complex as the system it sets out to control.
This paper is not the place to discuss such concepts and laws in precise
terms, but they offer a relevant guide. It is a safe conjecture to interpret
the law of requisite variety for urban planning systems as implying the need
for a wide variety of institutions. It is interesting that Friend and Jessop[25]
make a similar point, also quoting Ross Ashby, in relation to the function
of elected bodies in planning processes. They argue that a local council,
for example, *cannot* be sufficiently complex (i.e. have requisite variety) to
effectively represent the community, and this is what many of the present
demands for increased public participation are all about. The law of
requisite variety can probably be applied separately to planners, planned
and the institutions of interaction.

As an example, it can be shown how the law of requisite variety might
work out in a specific research context. Research units tend to take on the
style of a relatively small number of their senior staff. At any given time,
the results sought in a particular research context could probably be
derived most quickly from a particular style. In the nature of research
it would probably be impossible, a priori, to choose the 'winning' style
correctly. So, if a problem is important, several research groups should
attack it to guarantee quicker solution. An analogous need for institutional
variety arises in relation to public participation: the more institutions there
are representing the 'public' interest, the more likely it is that the interests
of specific community groups are communicated to the planners.

In the discussion of issues in the previous section, it was noted that this paper was essentially a paper in meta-planning. So, it is possible to stand outside planning in the discussion of possible developments and to apply the general notions of planning developed in the introductory section to planning itself. That is, the processes of analysis, design and policy making can be applied to urban planning itself. Analysis in this context would refer to the study of behaviour of institutions associated with planning, and was previously discussed in a rudimentary way. Design refers to the invention in institutional frameworks (with impacts checked out through analysis) which will make appropriate impacts on the issues raised in the second part of the third section. Policy making refers to the possibility of society having a policy *about* its planning frameworks, which in general terms may be stated as the need for requisite institutional variety to achieve control of urban systems in such a way that society efficiently achieves its goals. The importance of these statements is that it is possible to be systematic in relation to devising and using planning frameworks. It is obviously beyond the scope of this paper to carry such a systematic study much further, but it is appropriate to conclude with a brief examination of institutional design problems raised by the issues previously discussed. These thoughts can then be added to the analysis of the more obvious trends in institutional change already presented in this section.

Issues were raised under the general headings of goals, conflict resolution, communication and public participation. Goals can be articulated, as has been indicated, in relation to each of the functional sectors of governmental agencies—needs for housing, workplaces, access through the transportation system, and so on. It is important to recognise that this is only one way of articulating goals. It may be more effective to state societal goals in relation to needs to redistribute real income, and to create greater access to a wider range of access to opportunities (which is an example of a degree of freedom which can be created by effective planning), and the like, rather than in relation to functional sectors. This would then have implications for the design of planning institutions. Conflicts are resolved in what is usually called the political arena. Institutional variety is obviously important, and Stringer's research[25] on multi-organisations is also relevant in this context. This set of issues also illustrates the possible use of legislation: if a better system of compensation for gainers to pay losers could be devised and instituted for example, then conflicts would be easier to resolve. Methods of resolving communications issues were indicated in the previous section. It is interesting to note that Friend and Jessop recommend to local authorities that they should form within the authority a 'communications research unit'. The key point to emerge about public participation which has emerged is the need for professional resources to be available on the public side as well as the governmental side. It was suggested in one example that universities might play a role in this context. If developments of this type took place, the implementation of plans may be achieved more quickly and easily than hitherto, as the ground would have been thoroughly prepared for conflict resolution. It is often

thought that public participation involves slowing down the rate of implementation of plans, but this probably only happens in circumstances where the public do not have expert help available, so that far from the ground being prepared for conflict resolution, the opposite is true: it is known that there are conflicts, but they are not clearly understood and specified, and so the public can only use whatever power it has to block implementation. Such a situation would be especially acute when there was no efficient compensation system.

Above all, one final conclusion should be noted. It can be deduced from the law of requisite variety if it is not already obvious: the problem under discussion is so complex that it would be wrong to *expect* to find simple solutions. Such discussions as this represent a preliminary scratching of the surface of a set of very deep problems.

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