

THE “ILLINOIS SCHOOL” OF THINKING ABOUT PLANS

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1 MAKING AND USING PLANS: DEVELOPMENT OF THE “ILLINOIS SCHOOL”

Choosing the scope of a plan is a fundamental question for plan makers. This question arises both in explaining plan making we observe and in justifying plan making we recommend. We frame this question from the perspective of potential participants, from the bottom up, rather than from the perspective of creating a planning process by expert judgment about scope, from the top down, such as an attempt to involve all stakeholders or to be comprehensive.

These ideas are developed in the context of the “Illinois School” of thinking about plans. Ideas about plans have been developing at the University of Illinois at Urbana-Champaign since the appointment of Charles Mulford Robinson as Professor of Civic Design in 1913. The influences from 100 years of planning education and scholarship at Illinois on the broader scope ideas about planning of cities and regions and are being addressed elsewhere (<http://www.urban.uiuc.edu/100th/index.html>).

Several aspects distinguish the Illinois School of thinking about plans from the Chicago School, the Penn School, the University of North Carolina School, and the strategic choice (or IOR school) school. These aspects also suggest historical interactions and links to these other schools of planning thought.

1. Plans themselves are an important object of research, not just cities, political processes, policies, or justifications for government regulation or investment.
2. Analytical modeling is useful both conceptually (thinking about how things work) and operationally (analyzing a particular situation), but should be subjected to sophisticated challenge and used in combination with creative thinking and deliberation about what to do.
3. Intentional shaping of the future through actions that influence it is important, not just accommodating a population or economic projection or correcting market failures.
4. Plans analyzed as signals, in the sense of information economics, enable consideration of multiple actors, multiple plans, institutional organization of plan making, uncertain futures, and use of plans strategically over time, whereas considering plans only as targets to be implemented makes it difficult to recognize or consider these relationships.
5. All of this is pertinent to what land use and infrastructure planners do in practice by explaining the planning we observe and justifying the planning we do.

These aspects are not independent of each other. First, while elaborating each in turn, we build a narrative about how these ideas developed into a distinctive school of thought. Then, as another step in the Illinois School, we build on these ideas to consider plan led ad hoc coalitions.

1.1 Sources and Connections

Before focusing on the conceptual development of the ideas of the Illinois School of thought on plans, a brief story acknowledges some of the historical links. In 1970, returning from a summer in Europe, Lew was hanging out in Foyles book store in London and came across an interesting looking used book, *Local Government and Strategic Choice* (Friend and Jessop, 1969). Having read it on the plane, he discovered it on the reading list for one of the classes he took that fall at the University of Pennsylvania. The class was taught by Russell Ackoff (a student of C. West Churchman) and Robert Mitchell. Robert Mitchell graduated in architecture from the University of Illinois in 1930 and taught planning students for two years before going east, eventually becoming planning director in Philadelphia and founding chair of the planning program at the University of Pennsylvania. Mitchell and Rapkin wrote a well known early analyses of traffic and land use (Mitchell and Rapkin, 1954).

The strategic choice or Institute of Operations Research (IOR) School, as it is sometimes called (e.g., Faludi and Mastop, 1982) was of interest because it linked the analytical perspective of operations research (the interest of Ackoff) to the “on the ground” doing of planning (of interest to Mitchell) that Lew was combining in courses from Landscape Architecture, City Planning, and Regional Science at Penn. Brit Harris, who wrote “Plan or Projection: An Examination of the Use of Models in Planning” (Harris, 1960) was Lew’s PhD advisor. Gerrit’s advisor, Ed Whitelaw, was a student of Bill Wheaton, who was a student of Brit Harris.

The early faculty at Illinois, Charles Mulford Robinson, Harland Bartholomew, and Karl Lohmann, came from backgrounds in journalism, engineering, and landscape architecture. As scholars, they all wrote about planning, including not only the content of plans, but also the functions of plans (e.g., Bartholomew, 1932, Robinson, 1901, Lohmann, 1931) . Robinson (1916, p. 301) referenced estimates of cost savings from foresight rather correction in the development of urban infrastructure. The focus on streets and lots was in clear recognition of durable, difficult to reverse decisions, and included recognition that minor streets provide more flexibility over time compared to major streets (p. 293). Robinson also included extensive discussion of regulation and legislation as distinct from the plan itself. He also recognized that private, public, and third sector actors were making plans. The ways in which these ideas have been expressed have changed over time, in part to account for the salient issues of interest in particular scholarly conversations, but they remain crucial to the Illinois School.

Much of planning scholarship focuses on the phenomena that might be planned, and much of the scholarship on process focuses on collective action, market failure, government, regulation, and deliberative collective choice. These emphases derive in part from the influence of the Chicago School, seen by some as the source of a focus on rationality. More significantly, the Chicago School brought concepts from economic analysis and sociology into planning scholarship. These perspectives influenced policy analysis and the education of planning scholars (Sarbib, 1983).

One student at Chicago was Britton Harris, who, the story goes, did not want to read Chaucer as a senior, so switched his major from English to mathematics. This switch is indicative of his scope to use mathematical analysis not only to address computational, operational modeling, but also to frame conceptual ideas of what the models were about and what these models could do and not do (Harris, 1960, Harris, 1965, Harris and Wilson, 1978). The University of Pennsylvania at this time included a strong Regional Science department as well as a City and Regional Planning Department and this synergy mattered. Advocacy planning (Davidoff, 1965), urban design as a dynamic emergence from a succession of designs (Bacon, 1974, pp. 260-62), modeling of urban development (Herbert and Stevens, 1960), and ecological planning (McHarg, 1969) were all happening at Penn,

and students were finding ways to make sense of these ideas. Len Heumann, Lew Hopkins, Andy Isserman, and Barry Checkoway, all Penn grads made their way to the University of Illinois in the 1970s, joined at various times by Geoff Hewings, Mike Romanos, T. John Kim, Jan Brueckner, David Boyce, Peter Schaeffer, Alex Anas, Kieran Donaghy, Gerrit Knaap, and Luc Anselin, all with links to the spatial economics perspective of regional science.

1.2 Plans as the Object of Research

One legacy of the Chicago School is the use of economic concepts in making sense of the activities of planners. Two distinct paths emerged from the neoclassical focus on economic analysis of equilibrium systems: market failure and dynamics failure.

Most planning scholarship has built from the market failures of externalities and collective goods. These phenomena break the conditions under which a market economy will reach an equilibrium that has optimal, or at least desirable, characteristics of allocating resources efficiently. The generic responses to externalities and collective goods are regulation and provision by government. These responses, in turn, require collective choice. Much planning scholarship has thus focused on deliberative collective choice in the form of advocacy competition, consensus building, or institutional design. These questions manifest themselves in questions about relative power, mechanisms and skills for deliberative practice, and regional institutions. Plans in these frames are incidental artifacts expressing the decisions made by government entities. The particular work that plans do is largely ignored to focus on the policies, regulations, and investments by governments. The caricature of this approach is to forecast population for a point in time, then, based on deliberative collective choice, design a land use pattern and infrastructure investments for this population, and implement this design through zoning to control for externalities and a capital improvements program to provide collective goods. Some scholars, building on this frame, have focused on how to make plans. This work is most closely associated with the University of North Carolina, and might be labeled the “North Carolina School”, updated over five editions of *Urban Land Use Planning* (Berke et al., 2006).

Dynamics failure raises a different set of issues based on breaking a different set of conditions in neoclassical economics for the desirability of equilibrium outcomes. First, correcting the market failures so that the optimal equilibrium is achieved fails to ask the question of whether the resulting equilibrium based on neoclassical economics is indeed a desirable one. Second, correcting for externalities and collective goods ignores the underlying mathematical conception of an equilibrating process, the dynamics by which the equilibrium is claimed to be achieved. Third, correcting market failure through government has tended to create a focus on one decision situation at a time, a collective choice by a government entity, incidentally expressed as a plan. Fourth, this focus on one decision situation, one plan, at a time also tends to ignore uncertainty, presuming that the plan once chosen will continue to be correct and need only be implemented. The Illinois School builds more directly on dynamics failure, arguing that plans work to cope with these dynamics failures. Thus plans, rather than policies, regulations, or deliberative collective choice, become the focus of research.

1.3 Analytical Modeling

There is an underlying ambiguity that confounds equilibrium analysis in neoclassical economics, seemingly confusing some economists as well as those in other fields trying to make use of these concepts. The mathematical formulation of a free market economy is identical to an optimization problem of the allocation of resources to meet a set of demands based on budget constraints for demanders and resource constraints for suppliers. Thus the same mathematical model is both normative, what should happen, and positive, what will happen. But each of these claims is contingent on a large number of properties of the

modeled system. The measures of desirability for outcomes may not be the same as the incentives for behavior necessary to achieve them. Externalities and collective goods are specific instances of this, but not the only instances. That is, we can choose a system outcome that is not simply the market failure corrections for the system's individuals. Similarly, if we use an equilibrium model to predict what will happen, it may not be what we want to have happen.

This understanding became particularly salient from the development of the Herbert Stevens Model (Herbert and Stevens, 1960) because the model was designed to predict patterns of urban development in the Philadelphia metropolitan region by simulating a market for land as an optimization problem. Harris, the leader in operationalizing this model, understood the fundamental distinction between its role in prediction as distinct from plan, as expressed in "Plan or Projection" (Harris, 1960). An optimization to choose a plan would not be the same as an optimization to simulate a market. Others developed and worked at operationalizing models explicitly intended to choose optimal plans (e.g., Schlager, 1965).

Even with this distinction, there was still a step unaccounted for. In a course paper written at Penn, Hopkins used a mathematical programming framework to argue that there were three separable tasks, each framable as an optimization program: choosing a target land use pattern as in Schlager's model, predicting the outcome of current behaviors (as an equilibrium solution) as in the Herbert Stevens model, and minimizing the cost of changing price signals to change current behavior so as to yield the target instead of what would result from current price signals (Hopkins, 1974). This argument was entirely conceptual, intended to clarify the role of plans rather than to aspire to operational modeling for particular instances. For plans to do work, a target outcome had to function or be translated somehow as a signal to actors deciding what to do. And, these signals could be information. That is, plans could work directly as information, rather than only as the preliminary expressions of decisions about regulations or collective goods.

Modeling of urban regional development based on economic concepts went far beyond the simple optimization models of the 1960s, including important work by Illinois faculty (Alex Anas, David Boyce, Jan Brueckner, T. John Kim). These models identified general properties of urban form in relation to economic efficiency and estimated implications of various policies and market interventions. This use of analytical modeling for conceptual understanding and for empirical investigation has continued to be characteristic of the Illinois School.

1.4 Intentional Shaping of the Future through Actions

Conceptual recognition of the distinctions between plan, prediction, and action merely frames the question of how, in particular instances, we can link actions to futures in the face of uncertainty. One approach has been to focus on design concepts implemented through advocacy and regulation, as for example the New Urbanists and Smart growth advocates have done with noticeable success, including by Illinois faculty (Emily Talen, Gerrit Knaap). The Illinois School has retained its heritage in analytical modeling, not so much by attempts at direct optimization, but by embracing a mode of using models to learn how the world can work. Such modeling asks not only, what scenarios are possible or plausible in imagining the results of actions by others, but also what scenarios are possible and desirable through our own actions?

One way in which the basic equilibrium model of economics breaks down is when certain mathematical conditions lead to more than one equilibrium solution, more than one optimum. When there are multiple optima, then equilibrium models cannot predict a unique outcome. Thus, even if the model were a perfect simulation of the system, the outcome would be uncertain. Contrasting the optima, for example as distinct spatial patterns, may yield insights about what futures are plausible. If issues not modeled mattered, which they almost always

do, then optimization models with multiple optima may still be useful in combination with human deliberation. Other optimization work in the 1970s focused on multiple solutions, not just multiple objectives. The major results from this work were 1) that alternatives that were very similar in objectives space could be very different in geographic space, and 2) this matters because it means that a) we can use models and still consider unmodeled issues, and b) even if we are seeking particular objectives, we can achieve them in spatially different ways that allow us to adapt along the way (Hopkins et al., 1982, Hopkins, 1973, Hopkins et al., 1981, Brill et al., 1990). In a student workshop in the early 1980s, we made several maps to illustrate possible future land use patterns that might occur in response to a new reservoir and associated land use policies because it was clear that resulting development could not be placed deterministically.

Andy Isserman wrote an essay “Dare to Plan” in 1985 and related articles about using forecasting models (Isserman, 1984, Isserman, 1985, Isserman, 2007). “Dare to Plan” was a call to consider what should happen and to imagine aspirational futures without rejecting the possibility of analysis of how systems change, without rejecting the possibility of useful forecasting. He builds directly on Harris’s 1960 “Plan or Projection”, but focuses on population forecasting rather than urban development modeling. Among the tactics for using models, Isserman suggests using different chunks of history, longer or shorter sequences from which to project, as one way of thinking about how the world can work. In the most fully developed version (Isserman, 2007), he shows how considering economic modeling of employment and cohort component population models, both with interregional flows, we can investigate questions of labor supply, population, commuting, migration, and industrial structure in order to understand how a piece of the world is working and other ways in which it could work with consistent relationships among employment, population, and space.

Fundamental to the use of forecasting or plan making is recognition of uncertainty. We cannot know with certainty what will happen or what we can cause to happen. The traditional approach to this problem has been to bracket population forecasts between a high and low, a familiar graph in many comprehensive plans. As Isserman’s work, among many others, has made clear, the uncertainty is not simply about the size of population. It also includes industrial and employment structure, technology change, preference change, and politically driven regulations and governance structures. Working with this range of possibilities requires the kind of deliberative modeling with distinct but interdependent models of economic, social, and political systems.

Another approach to uncertainty is scenario planning, adapted from business management. Current work framing of scenario planning in the context of urban development, has been compiled in Hopkins and Zapata (2007). The key ideas are that we should imagine several possible futures that in some way sample the range of plausibility and then choose strategies of action that can cope with the entire range rather than pretending to be able to choose a particular future as if we are in complete control. The scenario approach is often confused with displaying possible futures, then choosing one, a longstanding traditional planning practice. It is important to be clear about what aspects are taken as external, differences among futures that are largely beyond our influence, and aspects that we can influence. Keeping this distinction in mind is crucial in designing coping strategies, which include robust, flexible, adaptive, and portfolio actions (Hopkins, 2001, pp. 74-75).

The scenario approach is often implemented by narrative expressions of futures as emerging from current conditions. The advantage of this approach is that it encourages broader thinking and explanation of how a future evolves over time. Isserman has long advocated to students that they should use analysis to tell a story. Narrative can build on analytical modeling (Guhathakurta, 2002). Chakraborty, Kaza, Knaap, and Deal (2011) have demonstrated the feasibility of using urban development modeling to consider multiple

futures and strategies for coping with such multiple futures from the perspectives of different agencies.

1.5 Plans as Signals

In the “Illinois School” plans are information. Information, in economic theory terms, is a signal that may influence decisions, our own or decisions of others, depending on how the information is shared. In economics, the quintessential signal is a market generated price, but in planning, the signal need not be price information and may be intentionally created and made available for strategic purposes.

The starting point in this approach is a single actor’s decision about how much planning to do. Think of this as deciding how much information to collect, how much time to spend figuring out what can be done, and how much signaling of intentions to send to others. Building on Friend and Jessop (1969), this question can be framed as a decision analysis problem, analogous to sampling from a population to determine attributes of the population based on Bayesian statistics (e.g., Hopkins, 1981, Hopkins, 2001 Ch. 4). Using decision analysis and information economics, in particular plans as information and their role as signals, Hopkins and Schaeffer (1983) considered who would have incentives to make plans, send signals, and some of the institutional implications.

Schaeffer and Hopkins (1987) used this frame to consider how land developers might decide how much planning to do at successive stages of the development process, taking into account costs of planning and expected changes in net benefits. This information might include information about potential sites, potential neighborhood opposition, and likelihood of gaining additional rights through changes in zoning. Schaeffer and Hopkins recognized that developers might want to keep some of this information (i.e., the resulting content from their decision to plan) secret from other developers and thus the public, but they do not model in game theory terms the strategic response of other developers or a government regulating agency. Intriligator and Sheshinski (1986) framed the single agent planning model in continuous form with a single state variable and explicit consideration of the interval between plans, the time horizon of each plan, the planned future values of the decision variable, and the cost of planning.

These ideas were also applied to the effects of urban growth boundaries and plans for infrastructure investments. Considering the effects of growth boundaries as regulations or infrastructure investments after they occur is distinct from assessing the effects of plans, of information, about what may happen. Framing urban growth boundary expansions as an inventory control problem implies that infrastructure providers and developers can view the expectations of change in the boundary over time as information (Knaap and Hopkins, 2001). Expectations as information result not only from plans for regulation, but also from plans for investment. Knaap, Ding, and Hopkins (Knaap et al., 2001) showed that plans for light rail affected developer decisions on parcels potentially influenced by light rail. Other work showed that developers responded to plans for sanitary sewer infrastructure (Hanley and Hopkins, 2007) and that considering changes in treatment plant location over time in the face of uncertain population growth patterns could yield financial savings (Hopkins et al., 2004). Thus information in plans, the signals, may be of use to an agency making the plan not only in signaling to others, but also in signaling to itself about likely future decisions.

Game theory enables us to consider strategic behavior that takes into account in a decision to plan the interacting strategies of other players. Hopkins (1981) used the formulation by Harsanyi (1967) of games with imperfect information and Bayesian players to explain situations in which actors might form voluntary groups to provide plan making for themselves or others or might seek enforceable regulations about paying for the provision of plan making. These explanations are based on oligopoly leadership in voluntary group formation

and on the pure collective good concepts from economics. These explanations recognize that the contents resulting from such plan making, using distinctions by Levine and Ponsard (1977), may be secret (keep others from knowing you have planned so that they cannot infer what to do by observation of what you do from your presumed better knowledge), unshared (others know you know more, but not what you know), or shared (others know what you know). Examples of such behaviors include voluntary groups developing large schemes, primarily for themselves, of new development (e.g., O'Mara, 1973), business group led plans for action by others, for example the Chicago Plan of 1909, and regional planning agencies that provide planning services to municipalities on a voluntary membership basis.

Using a Stackelberg game in continuous form, Knaap, Hopkins, and Donaghy (1998) argue that a provider of major infrastructure, such as light rail or sewage treatment, is likely to plan for its own purposes at its own expense because its own gains from planning for itself are likely to exceed its costs of plan making. This will occur despite the recognition that its plan has characteristics of a collective good because developers will benefit from knowledge of these plans even if developers do not pay for their creation. And the infrastructure provider will be better off sharing its plans because that will increase the likelihood that developers will behave as the infrastructure provider expects. Thus, the infrastructure provider will not want to exclude any developer from knowledge in order to enforce paying for the plan making. In game theory terms, the equilibrium solution of the game of paying for this planning, is for the infrastructure provider to plan and pay for it and to share the resulting information in the plan with developers. Neither the infrastructure provider nor the developers have reasons to diverge from this equilibrium. This interpretation depends on developers finding such plans credible. This interpretation was used to show that light rail plans in Portland, Oregon were credible and had the predicted effects (Knaap et al., 2001). This does not mean, however, that developers are not also making plans about their own decisions, which may or may not be shared.

The Stackelberg game emphasizes two important distinctions. First, an actor might participate in creating the content of a plan, or at least influencing that content, but not participate in paying for the cost of plan making. We need to consider whether developers will try to influence the content of the infrastructure provider's plan as well as whether they will participate in paying for it in a given strategic situation. Second, the participants in plan making are not necessarily the same as the participants in plan using. Developers might participate very little in influencing or paying for the infrastructure provider's plan making, but both the developers and the infrastructure provider have incentives for developers to use that plan in deciding what to do.

Wies (1992) used game theory to explain how counties, municipalities, and interest groups participated in the stages of a traditional transportation planning process for the Chicago metropolitan region. Some counties and municipalities chose not to participate actively at the goal setting and objective setting stages but then engaged in strategic coalition building to influence the choice of specific projects or project attributes, such as interchange locations. Wies argued that these choices could be explained through particular game structures about expected benefits and costs of participating at each stage of the planning process. In effect, the benefits were in expected influence on specific outcomes of interest and the costs were in time and effort expended to achieve that influence. This could be interpreted as analogous to choosing not to join the plan making regional coalition, relying instead on local plan making, then using these local plans to find coalitions among localities to participate in the third phase of regional planning to influence the inclusion of particular projects that were the best achievable at that point in the process relative to seeking to achieve local plans.

Most planning theory (non-Illinois School) actually focuses on reaching decisions, not on making or using plans. Making a plan is seen as identical to reporting a decision after it is made. The question for a planner is then, how do I help a bounded group reach a decision?

There is no consideration of signaling, uncertainty, or other decisions in the future or by others. But, in the Illinois School, a plan is a strategy in a dynamic Bayesian game with incomplete information. Plans are imperfect signals sent intentionally or inferred from observed actions, not reports of decisions. In the Illinois School based on dynamics failure, what matters is the sequence of price signals during the process of achieving equilibrium (Walrasian), not the observed price after equilibrium is reached. We cannot focus on plans as the object of research if there is no difference between a plan and a decision, between making a plan and making a decision.

If plans are signals within and among organizations, this raises the question of how such signals can be effectively represented. One response is to devise graphic devices for representing contingent actions in the face of uncertainty (Hopkins, 2007). Another is to design information systems of plans that enable sharing of information (Hopkins et al., 2005, Kaza and Hopkins, 2012, Finn et al., 2007).

The ideas of plans as signals make sense of observed planning from a “coherentist” philosophical perspective (Donaghy and Hopkins, 2006). These ideas also provide a distinct explanation to economists as to the capabilities and questions pertinent to planning (Kaza and Knaap, 2011). Plans as signals also provide particular research designs for assessing whether plans matter (Knaap et al., 1998, Hopkins, 2012).

1.6 Land Use and Infrastructure Planning Practice

These ideas, especially their basis in analytical mathematical modeling, may seem distant from practice. Much of this work has, however, been closely linked to prototypes for practice and is influencing practice. *Urban Development: The Logic of Making Plans* (Hopkins, 2001) tried to bring these ideas together, at least to record them in coherent fashion, and ideally communicate them to a broader audience of planners through illustrative applications and interpretations. The most frequently picked up ideas are agenda, design, policy, strategy, and vision as different ways in which plans work and “the four I’s”—interdependence, indivisibility, irreversibility, and imperfect foresight—as the aspects of situations necessary for plans as strategy to be useful. Excerpts were included in two readers aimed at practitioners or professional planning students and some of the ideas were included in the most recent edition of *Urban Land Use Planning* (Berke et al., 2006), the textbook of record for planning practice. *Engaging the Future: Forecasts, Scenarios, Plans, and Projects* (Hopkins and Zapata, 2007) presents a planning approach based on these ideas and framed as a request for proposals for planning services, which has been recognized as communicating effectively to practitioners (Knowlton, 2009, Seltzer, 2008).

2. PLAN LED AD HOC COALITIONS OVER TIME WITH MULTIPLE DECISIONS

To illustrate the approach of the Illinois School, we turn now to the question of plans in coalitions of organizations. We focus here on decisions about plan making as strategic interaction among actors whose intentions, beliefs, and interests are relatively stable and different from those of other actors. Consider the following general problem. There are several distinct actors with different geographic and functional jurisdictions that are partially overlapping, and actions taken by any one of these actors are in some way interdependent with actions of the other actors. In the Baltimore-Washington Corridor, for example, these actors would include the State of Maryland Department of Transportation, Montgomery and Howard counties, Chesapeake Bay Commission, Washington, DC Metropolitan Planning Organization, The Washington Suburban Sanitary Commission, municipalities, private developers, and many others, including private and non-profit organizations. Even within one organization, such as the state, there are distinct agencies with different missions and policies. Even for one function, such as transportation, there are many organizations with partial jurisdiction and overlapping geographic scopes. In some cases, more than one actor

must decide on a particular action, such as in Federal, state, and local shares in transportation projects.

Each of these actors must decide in which circumstances about what decisions to join what coalitions of plan making, which may include inducing others to join. This is not one decision but a continuing problem of plan making over time and scopes. Think of two extremes: I can either join a plan making coalition that is complete across geographic and functional scopes and that makes one common plan, or I can make my own plan, recognizing that other actors will make plans in coalitions of various sizes at various times about various issues and actions. By casual observation, plan making is a mix of activities between these two extremes.

To make sense of this question, we must consider using a plan, the complement of plan making. A plan made by a particular coalition is not, generally, used only by that coalition, much less only by that coalition as if it were a unitary actor. Even if the Washington Suburban Sanitary Commission and Montgomery County collaborate in a coalition to make a plan, these organizations still use the resulting plan in making decisions under their separate authorities and in their geographically incongruent jurisdictions. A set of plans made separately by actors whose decisions are interdependent will be used while coping with that interdependence, which may include sharing plan content, hiding plan content, and inferring hidden plan content. These individual plan users will use any one plan in conjunction with other plans.

2.1 Signaling Games and Coalitions of Making and Using Plans

The content of plans is information, imperfect signals about intentions as indicators of action and beliefs about how the world works. For present purposes, plan making generates information and sends signals. Plan using receives signals and interprets these in the face of particular decisions. In the case where there are multiple actors that are at least partially separable, there are thus two questions. In what circumstances should I join a coalition to generate information and send signals? In what circumstances should I use a particular plan, a set of signals, to achieve decisions, in particular decisions that depend on decisions of other actors who may also be using at least some of the same signals? In keeping with the Illinois School, we will start from rational choice theory and thus the usual ambiguity between should and will, justification and explanation. We return to this distinction in later examples.

For an individual actor, the decision about whether to plan depends on the expected net benefit from newly generated information (Hopkins, 1981, Schaeffer and Hopkins, 1987) and the net benefit from sending signals, which may include generated information and indicators of intentions that result from generating this information (Knaap et al., 1998, Kaza and Hopkins, 2006). If I consider joining an ad hoc coalition to make a plan I could benefit in at least two ways. I could share the costs, and thus increase net benefits. I could increase the credibility of the signals sent if the joint production of information increases trust among the participants or by third parties. On the other hand, I risk reduced benefit in at least two ways. The coalition's choice of information to be generated may not improve my decision making as much as information I would choose myself, including the issue of timeliness of information and signals. Information shared within the coalition in the plan making process and the coalition's choice of what signals to send and to whom may not fit my strategic interests as well as choices I could make on my own. These reduced benefits may apply not only to an individual considering joining a coalition, but also to the other members of the coalition. That is, if I join, your signal may become less useful to you because of modifications to account for my joining. This phenomenon, familiar in considering amendments in legislative coalitions, is also roughly analogous to club goods in economics.

Signaling games have been studied extensively in game theory (e.g., Gibbons, 1992, ch 4), including dynamic Bayesian games of incomplete information. In the case of infrastructure agency and developers analyzed in Knaap et al (1998), the game has a unique equilibrium. The agency will plan, share its signals widely, and developers will view these signals as credible.

Broadening the lens on this situation by considering a longer time and larger set of decisions, however, complicates the model. Developers may choose to use their own individual plans to influence the infrastructure agency's plan without publicly participating in the agency's plan making; the agency may infer developer's plans through their actions or inactions with respect to development in particular areas or at particular times. A school district, with different geographic and temporal scope might signal intent or infer development plans in different ways than a sanitary sewer agency, and thus leave developers with conflicting signals. Thus, once there are many actors and many plans in play over time, the question of how these plans are used in making decisions matters. For our purposes, coalitions are events, not structures. Said differently, we are interested in seeing sufficient spatial and temporal scope to understand changing coalitions of making and using plans over time. The individual agents remain independent actors, though not necessarily unchanged, retaining separate beliefs about how the world works and separate interests in carrying out their own actions. They may join different coalitions for different decisions, and agree on decisions for different reasons.

This broader lens leads us back to the more familiar application of signaling games, negotiation framed as bargaining, which has also been tied to resolution of negotiated decisions in planning (Lord, 2012). The focus on negotiation and bargaining is about decision making, not about making and using plans. Kaza and Hopkins (2009) make a distinction between the plan making process and the content of a resulting plan and argue that whether the process should take place in public and whether the resulting content should be public (signaled universally) are distinct questions, in part because of the distinction between deliberative effects and signaling effects. We thus consider coalitions to make plans and coalitions formed by using plans as distinct but interacting phenomena.

Although signaling games provide a useful set of concepts for thinking about strategies for use of signals taking account of the response functions of other players, the situations we now wish to understand take us to n person games in a succession of different, interacting games, a situation well beyond the feasibility of direct interpretation from formal analyses of game theory.

A coalition could be seen as making its own plan for its unitary interests and its members using it in interacting with plans of other coalitions, and thus forming a higher level coalition. We need not assume that any such coalition with members participating in making plans necessarily means that its members use resulting plans jointly. Individuals may have incentives to participate in a coalition of plan making, but still have incentives to use the resulting information in independent ways in achieving independent interests.

2.2 Explaining Observed Planning Coalitions in New Orleans Recovery

Explanations of who plans with whom will be overwhelmed by institutional structures or historical patterns if we focus on conventional cases embedded in historical claims about planning. Thus, municipalities in metropolitan areas have been planning together under inducements from Federal programs at least since the 1950s, driven primarily by transportation planning concerns. But as Wies (1992) shows, even these cases can be understood as intentional strategies of participation based on game theory. Calls for regional planning through consensus building for metropolitan regions are ubiquitous. Lester and Reckhow (2012) argue, however, that these regional visions are only one piece of a larger

set of initiatives and loosely coupled interactions among different interests. And, their citation of Long (1958) makes clear that understanding communities as ecosystems of interacting games is not new.

What we need is a fruit fly analog for planning research, a laboratory model of rapid change in planning activity that enables us to see many instances of actors creating new planning configurations in a short time and focused place. Disaster recovery planning has precisely these characteristics (Olshansky et al., 2012), and planning in New Orleans after Hurricane Katrina provides an opportunity to try these explanations as means for understanding what we observe.

In the recovery of New Orleans after Hurricane Katrina, the Parish School District had to decide which if any schools to reopen quickly and how to serve potential student demand of uncertain quantity and geographic distribution. The Housing Authority had to decide how to house residents through relocation or rehabbing of damaged buildings and was constrained by changing Federal policies about housing. Residents had to decide whether to rebuild their homes and return. The City had to decide which streets to rebuild, how to dispatch police and fire services, and where and at what level to provide many other services. Did all of these agents (and many others) join together in working out one plan sufficient to guide their respective actions? This possibility is unworkable on its face, and, despite calls for such a plan, that is not what happened. Will each of these actors recognize the potential value of joining some coalitions to influence plans about some subsets? Yes. Will this result in many plans of different, partially overlapping scopes? Yes.

There is now an extensive literature on planning during the recovery of New Orleans (Olshansky and Johnson, 2010, Wagner, 2010, Fields, 2009, Ford, 2010, Olshansky et al., 2009, Nelson et al., 2007). We use one example here: the Lafitte Greenway Corridor. A more complete narrative of this case and a Medical Center case are provided in Olshansky et al (2009).

The key players in this simplified story were the City of New Orleans, the Friends of Lafitte Corridor, the Mid-City Neighborhood Association, and the Housing Authority of New Orleans. In the wake of Katrina, each made its own plan. In their estimations of the plan making coalition possibilities, none of these players was confident that its interests would have sufficient salience in any plan by a broader coalition. The Bring New Orleans Back plan, created by a coalition of the city and business leaders and abandoned politically because of the reaction to its apparent proposal to abandon parts of the city to green space, made clear that competing interests could not be expressed in a common plan. The next round of broadly sanctioned planning focused on neighborhoods as distinct entities, though the Mid-City Neighborhood Association already had its own plan from which to participate in that process. Neville and Coats (2009) argue that much of the plan making in post Katrina New Orleans was done by ad-hoc neighborhood groups trying to figure out how to make their neighborhoods livable in the face of their major decision—whether to rebuild and return.

The Friends of the Lafitte Corridor, instigated by bike trail enthusiasts, jumped at the opportunity to realize a bike trail in an abandoned rail and industrial corridor. They developed their own plan as a means of advocating their particular intent and the interests that drove their formation. The demolition of a Housing Authority complex adjacent to the corridor in order to create a mixed income project was controversial given the extreme shortage of affordable housing. The Friends of Lafitte Corridor Plan largely ignored the adjacent housing project, choosing to signal its intent as independent of what might happen with respect to housing. Plans for the housing redevelopment similarly ignored the Corridor proposal. These players used their plans in advocating for their projects to be included in other plans prepared by the city because the city wide planning efforts, such as the Unified New Orleans Plan and the later Blakely Plan were seen as leading to capital funding allocation lists that would

influence Federal funding and choices among projects subject to a budget constraint. Players chose to participate in those broader efforts less from a perception of benefiting from generating common information or sending a joint signal than to argue for competing interests in an iterative decision process about funding.

This instance finds coalitions of information generation and intent signaling by individuals around interests—a bike path or neighborhood recovery, by lead agencies around affordable housing or schools, and by business interests and local government—the familiar growth machine coalition—around efficient and financially viable spatial development of real estate and infrastructure. Note also that the focus of this one case is ignoring all the conventional or mandated planning, for example by the Metropolitan Planning Organization or of the legally required Master Plan to back the city zoning ordinance under the revised charter. In other words, if we look for the conventional, prescribed planning we may find it. But if we ask who is deciding to plan with whom, given a sufficient time frame or planning compressed in time by disaster recovery, we will see ad hoc coalitions, at least in this case smaller in scope than our conventional lens of observation typically sees.

The signaled intent from the Bring New Orleans Back plan (BNOB), as received by many residents, was that the coalition of city and business interests behind it intended to drive them out of the city by turning their neighborhoods into green space. The response to this received signal, was even greater energy in small coalitions of interest in opposition to this intent, each coalition narrowing its size to focus its information collection and signaling on its urgent interests.

The neighborhood groups were interested in sending signals to their neighbors who had not yet returned: We have come back and we are working hard and investing in our houses. These are the things we are pushing for the neighborhood and concerns we are monitoring. Come back. Don't believe the BNOB plan, at least not for our neighborhood. The BNOB plan, however, was sending the opposite signal, and just because the BNOB plan was rejected politically, does not mean that no one was receiving its signals as credible. We could argue that the credibility of the BNOB signal that not all neighborhoods would recover was increased by its political rejection because some people realized how hard they would have to fight its scenarios and that business interests might see it as very credible.

The Unified New Orleans Plan took as a starting point that all neighborhoods would recover. This assumption made it possible to engage neighborhood groups, perhaps making its process credible, but arguably undermined the credibility of its result. The participation by these small coalitions in the processes of the ensuing Unified New Orleans Plan was at least as much about using their own plans, their small coalitions of interest around a neighborhood or around advocacy or opposition to a particular project, to compete in what they perceived as an iterative march to funding allocation decisions. They did not trust these plans to be credible commitments of intent by funding agencies, in part because they saw little happening physically.

In the process of this march to decisions by funding authorities, the separate interests identified relationships with other interests in order to reduce opposition or gain support. The Friends of Lafitte Corridor were signaling that they wanted a bike path, a continuous and safe connection to downtown; if others also wanted parks in the neighborhood, that was OK, but not crucial. The Mid-City Neighborhood Association recognized that the bike path corridor would bring city infrastructure dollars to their neighborhood, while also voicing concerns about the amount of land consumed and the mix of adjacent land uses. They used their individual plans, but annotated them in communicating to various audiences, to deal with interactions among their interests. The interactions among these coalitions in using the resulting plans provide an alternative narrative to the more traditional consensus building, shared vision narrative of much planning.

2.3 Explaining Observed Planning Coalitions in Maryland

The state of Maryland offers several good examples of ad hoc coalitions that engage in planning, though they lack the urgency of planning for New Orleans. In 2006 an ad hoc coalition of land use stakeholders organized a visioning exercise called Reality Check Plus. The exercise was led by the National Center for Smart Growth, the Urban Land Institute, and 1000 Friends of Maryland and included more than 20 state agencies, local governments, advocacy groups and professional organizations. Held at four locations around the state, the exercise included nearly 900 participants. By placing Lego blocks on regional maps, participants were able to offer a general expression of preferred spatial patterns of future growth. Such exercises lack depth but can produce a set of general policy statements that have some legitimacy. Each organization in this coalition believed it could benefit from generating additional understanding about spatial implications of plausible growth and disseminating this signal about how the world worked.

After the Reality Check Plus exercise, a new coalition was formed called PLUS (Partnerships for Land Use Success) to promote those general policy statements. The organization included 1000 Friends of Maryland, the National Center for Smart Growth, the Maryland Homebuilders Association, and the Maryland Municipal League. This coalition was short lived, however, because differences widened as the planning agenda became more specific.

This simple, although probably not uncommon, instance of ad hoc planning illustrates a key principle. Ad hoc coalitions for planning can include large numbers of organizations when the planning is highly stylized and more visionary than strategic. As the level of specificity rises, however, the number of participating organizations falls. This well known principle of interest group politics also applies to ad hoc planning. Said differently, Reality Check Plus was an ad hoc coalition that should not be expected to survive beyond a specific planning event around which it emerged. Using the newly generated and disseminated understanding of urban growth is a different activity, and each organization may now wish to send distinct signals about projects or regulations.

A more unusual example has arisen in the preparation of PlanMaryland, the state development plan. By executive order, all state agencies were required to prepare implementation strategies with intent to align the programs and policies of the various state agencies with the land use plan developed by the Department of Planning. In short, the objective was consistent planning across agencies. State agencies planning under an executive order may not seem to be an opportunity for ad hoc coalitions, but the way agencies responded illustrates several principles of the Illinois School. Although every agency submitted something in response to the executive order, many agencies offered only general statements of what they were already doing, or clipped material from previously published documents. Only the departments of transportation, natural resources, housing, and environment were able to identify how PlanMaryland could be used to further agency interests and how those interests could be advanced even further by engaging in the planning exercise with other state agencies. Of course the work of these four agencies is fraught with the four I's (interdependence, irreversibility, indivisibility, and imperfect foresight), so they are naturally inclined to plan, in particular in response to a land use plan. But more interestingly these agencies recognized their interdependence and how that interdependence could be exploited through planning. Each of these agencies recognized that at least some of the signals it wanted to devise and disseminate would be more credible and effective if embedded in the more tightly coupled PlanMaryland frame than if disseminated separately.

In contrast, the Department of Business and Economic Development (DBED)--which views its mission as creating jobs of any kind in any place--views PlanMaryland as more of a constraint than an opportunity. This agency did not want to send a signal to potential

locators, or to its other constituencies, that it would necessarily be constrained by the policies of other agencies. The superficial response of DBED might be interpreted as lack of understanding of the possibility of using PlanMaryland to its advantage, perhaps because it did not recognize any interdependence with the other agencies. Or, this response might be interpreted as an intentional strategy that would satisfy the public image of meeting the executive mandate, while sending a signal that anyone looking for credible signals about what the Department of Business and Economic Development was up to should look elsewhere, not at PlanMaryland. This instance illustrates that, especially in situations of mandated participation in a coalition of plan making, it is important to consider separately the credibility and strategy of participation of each organization in the coalition. Participants in ad hoc coalitions participate for different reasons and in different ways.

These examples demonstrate that interpretation as ad hoc coalitions can be useful in making sense of planning across disparate organizations from civic organizations to units of government and planning within organizations such as state agencies reporting to one executive. The apparent constraint of existing institutional structures, even apparently strong hierarchical control structures such as state executive branch agencies, states and their chartered municipalities, or universities and their subunits, does not lead to fundamentally different phenomena. We now use this understanding to consider briefly its implications for deciding how to justify choices about participating in an ad hoc coalition of planning.

2.4 Justifying Behavior in Planning Coalitions

How can we frame the choice of which coalitions an agent should join? How can we frame the tradeoff between joining a particular plan making coalition and using, perhaps no longer jointly, the resulting plan versus joining a different coalition or no coalition? More precisely, how can we frame the question of which combination of plan making coalitions we should join taking into account how the resulting plans will be used?

Using the state agency example for PlanMaryland, each agency plausibly could benefit from sending some signals, but even though the agencies are all at the same level of government, the signals cannot be meaningful if they are a priori required to be consistent. Some of these signals will be within the agency, some among agencies, some to the governor, some to the legislature, and some to various public constituencies, and it is, therefore, unlikely that all these signals will be consistent, especially across agencies over time. It is likely that each agency, and even departments within an agency, could gain net benefits from generating a plan, information and signals, of its own. It can be useful if at least some of these plans are communicated in a partially similar, commensurable format so that overlapping signals of intent or beliefs about how the world works can be recognized. Some of these signals, however, should not be explicit in published plans for strategic reasons. In summary, agency heads should use planning techniques to advance the mission and interests of the agency in the context of its institutional and political situation. Governors who mandate planning across agencies should do so with the recognition that the result should be interpreted as the result of an ad hoc coalition of plan making, not as the literal realization of a consistent plan. And, agency heads and governors should recognize that each is behaving this way even if it is not politically or strategically useful to emphasize this publicly.

In the more loosely coupled institutional structures of New Orleans Recovery and the Maryland Reality Check Plus coalitions, the same principles apply. As an environmental enthusiast, is it more effective to join a coalition to generate scenarios of urban growth or to work alone (or in a smaller coalition) to create an environmentally driven plan (or scenarios)? Similarly, for economic development enthusiasts, is it better to join a broad coalition or a narrow coalition focused on a growth machine driven plan? The tradeoff is whether what needs to be figured out (analyzed) and what needs to be signaled to advance these interests becomes so watered down in combination that the plan making effort is less effective.

Given the tasks in Reality Check Plus, each coalition member should choose to join because despite conflicting objectives and interests, the activity of showing implications of growth patterns is useful for each coalition member. They can save costs of carrying out the exercise by sharing the costs with others and they can gain credibility for the signal sent—the reported implications of different growth patterns and the difficulties of accomplishing what everyone wants—by reporting them jointly rather than alone. Reality Check Plus is not inherently environmental, smart growth, or growth machine, which increases the credibility of the combined signal. Once that credible signal is sent, the organizations should consider other coalitions for other planning activities, and these other coalitions are likely to be different. In particular, if the later coalitions are focused on particular infrastructure projects in particular dealing with proposals for infrastructure investments or regulation in particular places, the coalitions are likely to be smaller and involve direct conflicts between members of the previous, larger coalition.

The New Orleans examples include instances of these smaller coalitions, such as the Friends of the Lafitte Corridor. Bike path enthusiasts who see an opportunity in recovery to get a bike path built should devise their own plan, their own narrow coalition, around the bike path details of the corridor in a way that will be particularly effective in signaling their intent in its institutional context. Housing enthusiasts and school districts and city, county, state, and federal agencies should behave similarly.

These recommendations for strategic use of planning may sound like the traditional arguments for advocacy planning, but there is an important difference inherent in the Illinois School. The confusion is about whether differences are being resolved in a plan or in a decision. In advocacy planning the role of the plan gets lost. The focus in advocacy planning is on the competing advocates for a particular decision at the time that decision is being made. In other words, advocacy planning is about decisions, not plans. Plans are about generating information and sending signals. The questions for coalitions of plan making is when, in the massive mix of games, does it make sense to make plans and signal the results of these plans as intent that will influence ourselves and others?

3 CONCLUSIONS: SHAPING THE FUTURE OF THE ILLINOIS SCHOOL

After 100 years, the Illinois School continues to evolve through the influence of publications, practice of its alumni, and the dispersion of former faculty and graduates of its PhD program. Whether the particular aspects of its ideas about plans that are retrospectively salient now—plans as objects of research, analytical modeling, intentionally shaping the future, plans as signals, and pertinence to land use practice—will be sustained in the future is less important than continuing contributions to our thinking about plans.

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