Lessons Learned About Planning

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Perspective

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Forecasting, Participation, and Technology

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The author summarizes the most important lessons he has learned in more than 40 years of studying planning from the perspectives of planning theory, planning methods, and computer applications in planning. He suggests that planner's traditional professional roles, models, and methods often fail to adequately consider alternative futures and unnecessarily restrict meaningful public participation. He proposes that these problems can be overcome, but not easily, by adopting more community-centered approaches of planning with the public and using simple, easy-to-use, and understandable models and methods. The author recognizes that following his advice in practice raises many difficult questions that he cannot currently answer.

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I entered planning in 1971 during an exciting time of social and technological optimism at what may have been a high-water mark for public-sector planning in the United States. New academic planning programs were being created and planning went far beyond its previous focus on the physical city to include social policy, health, and criminal justice planning. In the decades since 1976, when I received my doctorate, I have benefited from an explosion of planning scholarship with the emergence of new books, new journals, new academic fields, and new organizations. The resulting body of academic research has dramatically increased our understanding of all aspects of planning, including the areas of particular interest to me: planning theory, planning methods, and computer applications in planning.

The work of a generation of planning theorists has given me an increased appreciation for the complex reality of planning practice, the limited role of formal information and quantitative analysis in policymaking, and the vital role that less formal types of information such as stories, metaphors, and personal experiences play in planning practice (see, e.g., Forester, 1989; Healey, 1992; Innes, 1995; Sager, 1994; Throgmorton, 1996; an excellent review is also provided in Healey, 2012). Like other planners, I have also benefited from the expansion of planners' repertoire to include meditation, negotiation, and consensus building (see, e.g., Innes, 1996; Innes & Booher, 2010; Susskind & Ozawa, 1984). I played a small role in these efforts, authoring a widely read defense of planning (Klosterman, 1985) and editing four decennial surveys of planning theory education (Klosterman, 2011).

Dramatic advances in information and communication technologies (ICT) since I first used computers in 1968 have made sophisticated computer programs and a wealth of spatially referenced data readily available to planners. It has also allowed them to communicate quickly and easily with clients and colleagues, anywhere and anytime, and prepare interactive virtual displays that were unimaginable when I entered planning. I have explored the ways in which these developments have affected planning as the *JAPA*'s Computer Reports Editor, in my publications (e.g., Klosterman, 1992, 1994), and by combining my interests in planning theory and computer applications in planning (Klosterman, 1987, 1997, 2007).

The dramatic advances in computer technology have made GIS a standard part of planning education and professional practice and stimulated a revolution in spatial analysis and urban modeling. I have contributed to these changes through a widely used textbook (Klosterman, 1990) and developing the What if? planning support system (Klosterman, 1999, 2008), which uses GIS data and user-defined assumptions to explore the implications of different growth assumptions and policy choices.[1]

This essay combines my understanding of the role that planning can and should play in helping a community engage an uncertain future with my realization that complex planning models and methods are more likely to reinforce planner-centric, top-down planning than to help planners work with the communities they serve to develop a shared vision of their future. However, I also believe that properly designed, simple planning models and methods will allow planners to give community members a more meaningful role in the decisions that affect their lives. This essay describes the lessons I've learned over the last 40 years that have led me to these conclusions.

The Need for Future-Oriented Planning

Like others in my generation (Brooks, 1988; Isserman, 1985; Myers, 2001), I believe that planners have all too often abandoned their traditional role of helping communities consider what the future may and should be. Instead, many planners focus their efforts largely on pragmatic problem solving and more immediate concerns of community development, code enforcement, and public-private development. Planners often neglect the future because the press of daily job requirements and the desire for job security understandably focus their attention on short-term concerns with clearly identified results. But I also know that the widespread adoption of social science methods and GIS, while greatly enhancing planners' skill sets, provides little assistance in helping communities engage with their collective futures.

As planners, we realize that current actions affect future outcomes and that taking no action is an action in itself. Planning assumes that individuals, organizations, and communities can control their fate and take action to achieve desired futures and avoid undesirable ones. Without planning, communities can only stumble blindly into a future they make no effort to shape. With planning, the future is the result of the interaction of underlying trends and the public's efforts to modify them (Moore, 2007).

However, we also recognize that there are many obstacles to public-sector planning for the future. Elected officials generally focus public attention on issues immediately at hand. Property owners are understandably wary of public actions that may affect the value of their most precious asset. Businesses, large and small, place their particular interests above those of society at large. The rhetoric of protecting property rights and promoting individual freedom disparages government efforts to address the long-term collective interests of the community and protect the poor and powerless, while benefiting the rich and powerful.

The good news is that Americans like planning. They prepare plans for their personal lives, for the organizations to which they belong, and for the companies that employ them. They care deeply about their neighborhoods and communities and are vitally concerned about the future they are leaving their children and grandchildren. Given the opportunity, people turn out night after night to express their concerns and their hopes for a better future. Arbitrary-seeming regulations and the lack of a meaningful role in helping shape their world are what Americans understandably resist (Warner, 2000).[2]

The challenge for planning academics and practitioners alike is to create and use institutions, procedures, methods, and models that give voice to the latent demand for planning and address critical issues of environmental sustainability, deteriorating infrastructure, and growing disparities of wealth and power. Experience has proven that this is much more difficult than I once imagined. However, it has also taught me that appropriate modes of professional practice and new planning models and methods can help planners and the public they serve work together to address their shared futures. I have learned many lessons about the obstacles to, and promise for, more effective planning, which I describe below.

> You spend your life walking backwards because you can see the past but not the future; that's why we trip.
> —Maöri proverb[3]

Forecasting the Future Is Difficult

Forecasting the future has long played a central role in planning. Like many planners with a technical background, I assumed for much of my career that the sophisticated methods of regional science and the policy sciences could be used to identify past trends and accurately predict the future.[4] Given this information, I thought that planners could reliably prepare long- and short-term plans for a community

and identify the public infrastructure and services that would be required to serve its future needs.

I now recognize that individuals and organizations cannot accurately predict their long-term futures, and there is no reason to assume that planners can foresee an unknowable future better than the public they serve. At best, planners' models can only provide explicit logical and mathematical procedures for determining the implications that can be drawn from limited information about the past and present and plausible assumptions about the future. To ask for more is to require the impossible.

The Role of Assumptions

I also realize that the application of any model is ultimately dependent on the core assumptions that represent the modelers' understanding of the future. These assumptions cannot be derived from a method or model. On the contrary, a model is just a vehicle for tracing through the implications of the core assumptions that are chosen independently from, and prior to, the model that implements them. When the core assumptions are valid, the choice of methodology is either secondary or obvious. And when they are wrong, the projection methodology rarely makes a difference (Ascher, 1981).

Beneath their elaborate facades, planners' supposedly sophisticated methods and models generally do little more than extend past trends on the assumption that the future will be a foreseeable consequence of current conditions and past trends. This approach is ultimately justified by an assumption that these trends will continue into the future even though there is no guarantee they will do so. More important, blindly extending past trends into the future ignores the role of planning to help communities achieve desired futures and avoid undesirable ones. The future that occurs under planning is the result of underlying trends and planners' efforts to modify them. When the projected future is undesirable, the goal of planning will often be to prevent the most likely future from occurring. This means that accurate forecasting must anticipate both the nature and impact of community actions, part of which may be a response to the forecast. Otherwise, the future is taken as a given, which planning and society can accommodate, but cannot help determine (Isserman, 1985, 2007; Wachs, 2001).

The Politics of Forecasting

Like most planners, I have long recognized that planning is political. However, like many technically oriented planners, I once believed that planners' models and methods could be used to objectively identify and evaluate alternative public policy means while avoiding all political

questions of defining policy goals and objectives. (The following discussion draws on Klosterman, 1987; Wachs, 1982, 1989; also see Flyvbjerg, 2005; Flyvbjerg, Mette, & Buhl, 2002.)

This view is still widely shared by planners, elected officials, and the public, who often assume that planning models and methods are unbiased, politically neutral tools used by technical experts. Portraying forecasts as the objective outcomes of value-neutral analysis allows analysts to maintain their professional identities as politically neutral experts. Advocates of particular policy positions gain support for their positions by relying on supposedly unbiased technical analyses that support their positions. As well, politicians who choose between conflicting policy proposals can accept forecasts that correspond to their preconceptions and ignore those that do not. All three sets of actors (i.e., analysts, advocates, and politicians) gain by pretending that forecasts are objective, scientific statements, and not political arguments for a particular position.

However, I now recognize that value-neutral technical expertise in the preparation and use of forecasts is more apparent than real. Forecasts are rarely produced in a vacuum, but rather are prepared for a client (e.g., a government agency, an organization, a private firm, or an interest group) who often has a vested interest in the projected numbers and request, and even demand, projections that support public policies and actions that benefit them. More important, planning models and forecasts are not based on universally accepted bodies of theory and uncontested facts, but rather on incomplete data, partial hypotheses, and assumptions about what the future will and should be. As a result, the preparation and use of planning models and methods necessarily involves numerous choices in the selection of data, the application of computational procedures, and the analysis, presentation, and distribution of results. These choices are inherently political because they can shape the analysis results, the perception of problems, and the definition of potential solutions, helping answer the fundamental political question of who gets what, when, and how.[5]

Technical Problems of Forecasting

The forecasting task facing planners is further complicated because they generally work with information that is out of date, estimated, or collected at the wrong level of spatial and sectoral aggregation. Predictions in the natural sciences are based on well-developed bodies of theory and carefully controlled experiments that are impossible in the social sphere. Private-sector forecasters can use large quantities of reliable data and sophisticated

projection techniques that are unavailable to most planners. As a result, it is not at all surprising that planners' forecasts for the long-term future of cities and neighborhoods inevitably prove to be wrong.

Another problem is the frequent need to prepare long-term projections for small areas. Planners can prepare short-term projections for small areas relatively easily because demographic and economic changes over a two- or three-year period are generally small. However, projecting long-term changes is extremely difficult for sub-county areas, where new residential developments and employment centers or changes in local land use policies can lead to substantial population and employment changes over relatively short time periods. (These general observations are supported by empirical tests of forecast accuracy; see, e.g., S. K. Smith, 1987; S. K. Smith & Shahidullah, 1995).

> **Scenario:** an account or synopsis of a possible course of action or events. ("Scenario," 2014)

The Promise of Scenario Planning

I agree with a growing number of scholars who suggest that planners abandon the futile effort to predict what the future will be and prepare a range of scenarios suggesting what the future may be (see, e.g., Avin & Dembner, 2001; Hopkins & Zapata, 2007; Myers & Kitsuse, 2000; Xiang & Clarke, 2003). Scenarios are much more than predictions and forecasts that merely extend past trends to identify a single future. Instead, they describe a range of plausible and divergent stories describing how the future may unfold and how it might be different from the past. Scenarios are not visions, because not all of the futures may be desirable; they are not forecasts, because they describe a process of change, not a single point in time. Scenarios recognize the uncertainty and complexity of foresight and provide a way to think carefully about the future without trying to predict what it will be. (This discussion draws on Avin, 2007; Hopkins & Zapata, 2007; E. Smith, 2007.)

Scenarios are used in the private sector to help organizations survive and prosper in the face of future contingencies and competition. In the public sector, a diverse group of people work together to create a range of different scenarios that challenges the assumptions individuals may have about the future and allow them to jointly consider their shared future. Done well, scenario planning allows community members to learn about their community, identify what the community can control, recognize what it cannot control, and consider the implications of choices they make today.

In current practice, planners select a single preferred future from a small set of alternative futures, which generally include high, medium, and low options (a desired future with two bookends) or two options, one of which is a baseline business-as-usual option that serves a foil for the preferred option. Assuming they can control the future, planners then discard the less-desirable options and attempt to make the desired future happen. Under fully realized scenario planning, there are no good and bad scenarios, but rather a collection of plausible alternatives, some of which may include new, sometimes even uncomfortable, possibilities. (Hopkins and Zapata [2007] provide several excellent examples of scenario planning in practice.)

Scenario planning can play an important role in attempts to engage the future by providing an opportunity for planners and the communities they serve to co-write compelling stories about the past and present and develop strategies for creating a better future. Compelling, evidence-based stories about the past, present, and desired future embedded in scenarios with plausible plot lines can also set the stage for planning by creating a sense of place that inspires planning action to achieve a desired future. Planners can play a central role in this process by helping communities understand where they are, how they got there, and where they would like to go in the future (Isserman, 2007).

> I participate; you participate; he participates; we participate; you participate…*They profit.*
> —Arnstein (1969, p. 387, quoting 1968 French student poster)

Meaningful Participation Is a Problem

Like all planners, I have long assumed that the public should have a meaningful role in shaping the decisions that shape their lives. However, I now realize that public participation efforts are all too often viewed by the public and planners alike as perfunctory, going-through-the-motions rituals conducted primarily to satisfy legal requirements and obtain public support for agency proposals.

The plans and proposals that shape policy discussion are generally prepared by planning staff and consultants with little input from citizens or stakeholders. While planners may solicit public comments, distribute attitude surveys, and appoint volunteer working committees, the public's formal role in the planning process is all too often limited to a public hearing held at the end of the process,

just before the action or policy is approved. Minor changes may be made in response to the comments made at the meeting, but the core decision concerning the issues to be addressed, the alternatives to be considered, and the criteria to be used in evaluating them will have been made long before the public is involved.

Under these circumstances, public participation is all too often little more than a means for ratifying choices made by professionals pursuing their own perceptions of the public interest. More troubling, public involvement is generally limited to an iron triangle of local business and development interests, public officials, and neighborhood groups, to the exclusion of the poor and unrepresented interests (Burby, 2003; Klein, 2000).

I believe that the public's limited role in planning practice is due in part to the professional role that has defined the profession since its inception. The early planning profession adopted the perspective of planning as design, which assumed that planning a city is fundamentally the same as designing a building or designing a landscape.[6] In the mid-20th century the profession adopted a new ideal of planning as applied science, which attempted to replace the intuitive designs of the planner–architects with the scientific methods and findings of the emerging fields of regional science, urban economics, and operations research.

Both of these approaches were based on an implicit model of planning for the public, which assumed that planners could achieve in the public sector the deliberate outcomes that are readily accomplished in a private firm or a centrally controlled government enterprise. (The following discussion draws on Klosterman, 2008, pp. 86–87.) In these settings, there is generally a single client with a clearly defined future, well-defined objectives, long-established means for achieving those objectives, and centralized control over the resources needed to achieve them. Together, these factors allow technical experts to prepare blueprints providing detailed guidance for constructing the structure or landscape that will best serve their client's needs.

Planners replaced the private sector's client with the public and the client's desires with their own perceptions of the public interest. The client's desired future was replaced by the planners' projections for the city's future population, employment, land uses, and related infrastructure demands. The designer's blueprints were replaced by comprehensive plans, which were assumed to guide public and private actions toward a shared image of the desired future.

I now realize that public-sector planning lacks all of the conditions that characterize private-sector planning. The public does not share a clearly defined set of objectives

that can guide planning practice. Reliable long-term forecasts for small areas are difficult, if not impossible, to prepare. The norms of professional practice are inadequate for dealing with the increasingly complex issues facing planning. The urban fabric is shaped by the actions of a diverse range of organizations and groups, largely outside the control of planners.

Fortunately, an alternative ideal of planning with the public promises to overcome the most important limitations of planning for the public. I believe that computer modeling and methods can play an important role in achieving this ideal.

Form follows failure.—Petroski (1992, p. 22)[7]

The Promise of Planning With the Public

Traditional Models and New Approaches

Planning with the public is not limited to the formal models that have been proposed in the academic literature. Instead, planning with the public requires that, whenever possible, planners involve as many members of the public, as completely as possible, in the decisions that affect their lives. Unlike traditional public hearings conducted at the end of the planning process, citizens are involved throughout the planning process in a collective effort to understand the community's past and present and identify its preferred future.

Planning with the people who live and work in a community encourages planners to learn from those most familiar with local conditions and the realities in which plans will be implemented. It also helps planners understand the concerns of stakeholders, identify potential collaborators and latent opposition, and mobilize support for issues that have traditionally lacked public support (Healey 2010; Innes & Booher, 2010).

This suggests that planners should strive to help communities understand where they are, how they got there, and where they would like to go in the future. Rather than preparing plans and proposals that they believe best serve the needs of their clients, planners should attempt to facilitate and inform a citizen-led policy process. Instead of blindly extending past trends, planners should become authorities on the area for which they are planning, learning about its past and present, understanding the potential and limitations of its natural and organizational resources, and identifying the key factors that will affect its future development (Isserman, 1984).

The Difficulty of Planning With the Public

I certainly realize that, taken seriously, planning with the public will be more challenging for planners and the communities they serve than the practices of the past. It will require much more than the popular regional visioning and scenario-planning exercises in which a small number of self-selected citizens gather around tables and devote a few hours to placing chips or Lego blocks representing planner-generated land use demands to locations on maps of their region. Participants find these exercises engaging, empowering, and fun; they readily generate favorable media coverage; and they often increase public awareness of planning issues. However, it is unreasonable to assume that a diverse group of citizens can produce meaningful scenarios in a few hours in the absence of information on the feasibility and implications of alternative policy alternatives. As a result, they all too often serve largely as exercises in unproductive wishful thinking or as mechanisms for promoting planners' preferred options for the future (Bartholomew, 2007; Chakraborty, 2011; Helling, 1998).[8]

It is also important to recognize that the perceptions of individuals and groups are inevitably colored by their personal experiences and their limited understanding of the past and present. In the face of overwhelming problems and crippling uncertainty, communities often retreat to an idealized past rather than looking realistically at their current conditions and the most likely future (Baum, 1999).[9] As a result, community-based planning and forecasting using simple analytical models and tools can be extremely helpful in augmenting the partial, poorly defined, and often faulty tacit knowledge stored in individuals' mental models with explicitly defined public knowledge, helping reduce the influence of expedient viewpoints and resist overly wishful or pessimistic thinking (Skaburskis, 1995).

KISS: Keep It Simple, Stupid.[10]

Use Technology Right

The tremendous advances in computer technology in the last 40 years have been accompanied by a series of technologies (large-scale urban models, spreadsheets, expert systems, GIS, planning support systems [PSS], and the Internet), each promising to revolutionize planning practice and research (reviews of these developments are provided in Klosterman, 1992, 1997). Unfortunately, planners rarely use computer-based models and methods to help communities engage the future because the current generation of planning models and methods generally does not overcome the realities of planning practice that I identified previously.

The widespread adoption of GIS and office productivity tools, while extremely useful for facilitating routine management tasks, has diverted planners' attention from their traditional concern with helping shape the future. Implementing planners' forecasting methods in a computer does not make planning any less political or an unknown future any more certain. Technologies such as public participation GIS, which uses GIS and the Internet to inform the public and collect citizen inputs, provide no assurance that the public's role in public policymaking will climb above the lowest rungs of Arnstein's participation ladder (Arnstein, 1969; McCall & Dunn, 2012).

More important, implementing planning methods in a computer does not eliminate the need to make assumptions and choices. Representing a complex reality in a computer model inevitably requires choices in specifying causal relationships, selecting input variables, and adjusting model outputs so that they are reasonable to modelers and their clients. Every component of a forecasting model is a hypothesis that may be valid for short-term forecasts, but is highly questionable for the 20- to 30-year forecasts planners routinely prepare. The more complex the model, the larger the number of (often hidden) assumptions. Computer-based models and methods do not reduce the need to make assumptions; they only hide them in computer algorithms, which are unfathomable to outsiders.

In an attempt to mimic engineering prototypes and architects' scale models, planners have developed large and complex models that attempt to capture the city in a computer. I now recognize that these efforts reflect and support the profession-centered model of planning that I critiqued above. Fortunately, these models have been augmented in recent years by the development of GIS-based PSS, which use simpler modeling approaches in an effort to support the future-oriented, community-based planning efforts that I feel should be the center of planning practice (see, e.g., Brail, 2008; Geertman, Toppen, & Stillwell, 2013).

In my opinion, the use of simple planning models is justified by Box's Law: "All models are wrong; some models are useful" (Box & Draper, 1987, p. 424). (The following discussion draws on Ascher, 1978; Klosterman, 2012).

The first part of the law is true by definition because a model is a simplification of reality that selectively focuses attention on some aspects of a complex world and ignores others. As a result, all models are inevitably wrong in the sense that they are incomplete and leave out some aspects of reality. However, Box's Law also suggests that the question isn't whether a model is correct in some absolute sense, but rather whether it is useful for a particular purpose. A model can serve a number of purposes: to develop or test

theory, to provide a sheen of technical sophistication to public policymaking, to enhance the reputation and income of the modeler, or to support professional practice. While all of these objectives are valid, computer models' primary value for planning practice lies in their ability to help planners and the communities they serve understand the present and engage the future.

Complex models are large and expensive systems that provide detailed answers to a wide range of policy questions and explicitly express causal relationships that are implicitly retained in the minds of analysts using less complex models. They are particularly useful for representing interconnected relationships, feedback loops, and other intricate relationships that are ignored by simpler models. However, as complex models add more variables and longer causal chains, they often require data that may not be available or measured correctly. As more variables are added the associated measurement errors may compound rapidly, overwhelming the specification errors made by not properly modeling underlying causal processes (Alonso, 1968; Wachs, 1982).

Analysts who rely on judgment and a simple model keep the richness of nuance and detail in their heads; complex model users rely instead on relationships, which are expressed in formal mathematical relationships they may not understand. Simple models also promote more open and democratic policymaking by making explicit the factual and political assumptions that complex models hide from view. By involving the public more directly in the modeling process, simple models not only limit the discretion of professionals but reduce the knowledge differential between professionals and laymen, generating information that is more familiar to, and more likely to be accepted by, policymakers and the public (Klosterman, 1987; Wachs, 2001).

Equally important, I was surprised to discover an extensive body of research demonstrating convincingly that complex forecasting models are no more accurate than simpler models (see, e.g., Makridakis, Hibbon, & Moser, 1979; S. K. Smith, 1987; S. K. Smith & Shahidullah, 1995). This research also suggests that simpler models are preferable when other factors such as flexibility, ease of use and interpretation, and the ability to use existing data and provide timely information are considered. As a result, it seems clear to me that planners should develop models that are as simple as possible, but not simpler.[11]

I believe that planning models and methods should serve as prostheses for the mind, allowing planners and the communities that they serve to understand the past and present, think systematically about the future, and focus their attention on ways they can work together to prepare for an uncertain future (Klosterman, 2008; for efforts along this line, see Isserman, 2007; Klosterman, 2007). To do this, models like my What if? PSS make explicit the assumptions about the past, present, future, and alternative policy choices that underlie the analysis results. They identify alternative policy options, allow them to be easily changed, and clearly identify the effects of different policy choices. Most important, they do not naively assume that we can predict the future, but instead explicitly acknowledge that the model results only indicate what would happen if the underlying modeling assumptions prove to be correct.

I hope that these simple models will encourage planners to view forecasts as the results of assumptions that may reflect the competing perspectives and interests of contending parties rather than clearly defined foundations for future action. Viewed in this way, the future is not a single grand vision or the inevitable consequence of past trends, but rather an object of public deliberation. Appropriate planning models and methods can play an essential role here by testing a range of forecasts and policy proposals derived from the policy preferences and assumptions of different segments of the population (Wachs, 2001).

Much More to Learn

It is understandable that planners of the past adapted the profession-centered model of planning for the public from architecture and engineering, which ignored the intellectual and political realities of helping communities engage an unknown and politically contentious future. However, I believe that it is time for the profession to combine modes of professional practice that directly involve stakeholders and the public with simple and easy-to-understand models and methods in a collective effort to determine what the future may and should be.

I realize that my recommendations raise a number of important questions for planning practice and theory: Can the simple, easy-to-use, and understandable planning models and methods that I believe should be used in public discourse deal adequately with the inherently wicked problems of an increasingly complex urban world? How can planners help multiple constituencies act strategically in the face of alternative visions of the future? How can planning models and methods best inform and improve collaborative planning processes? How can the tremendous potential of computer visualization and communication be used to promote meaningful participation? Most important, how can planners' attempts to plan with the public best help communities better engage an unknown and politically contentious future?

These questions and a host of others of which I am not aware make one thing clear: After 40 years of study, I still have many lessons to learn about planning.

Notes

1. My efforts in these areas continue. A revised edition of the methods text that incorporates the lessons described in this essay is currently being prepared, and I hope to develop a collection of open-source online applications that implement the methods in the book. The desktop version of the What if? PSS is no longer available, but an online, open-source version is currently being prepared in conjunction with the Australian Urban Research Infrastructure Network (https://aurin.org.au/).

2. The appeal of community-based planning is confirmed by a survey conducted by the American Planning Association (2012) in which more than 60% of the respondents from all political parties, in urban, suburban, and rural areas, believed that their communities need more planning, and more than one half of the respondents wanted to participate in community planning efforts.

3. The Māori are the indigenous Polynesian people of New Zealand. The quotation is from Lau (2004).

4. This view is regrettably reflected in the current version of my methods text (Klosterman, 1990).

5. As Innes (1998) points out, even apparently neutral requirements to collect particular kinds of information can fundamentally shape policymakers' perceptions of public policy issues and their responses to them.

6. The conception of planning as design has been recently been resurrected under that label of geodesign (McElvaney, 2012; Steinitz, 2012), which unfortunately shares many of the limitations of its previous incarnation.

7. This principle recognizes that all innovation is driven by the real or perceived shortcomings of things as they currently exist (i.e., their failure to function properly).

8. An alternative approach for using scenarios to create robust and contingent plans is described in Chakraborty, Kaza, Knaap, and Deal (2011).

9. Community visioning exercises all too often compound this problem by presenting imagined futures that do not recognize current conditions and political realities (Helling, 1998; Myers & Kitsuse, 2000).

10. The acronym was coined by Kelly Johnson (1910–1990), lead engineer at the Lockheed Skunk Works, creators of the Lockheed U-2 and SR-71 Blackbird spy planes, among many others. While popular usage translates it as "keep it simple, stupid," Johnson translated it as "keep it simple [and] stupid." There was no implicit meaning that an engineer was stupid; just the opposite. The principle is best exemplified by the story of Johnson handing a team of design engineers a handful of tools, with the challenge that the jet aircraft they were designing must be repairable by an average mechanic in the field under combat conditions with only these tools. Hence, the stupid refers to the relationship between the way things break and the sophistication available to fix them ("KISS Principle," 2012).

11. Like religious precepts, this principle is much easier to espouse than to practice, but is still useful as a guide to practice. It is generally attributed to Albert Einstein, but its originator isn't clear.

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