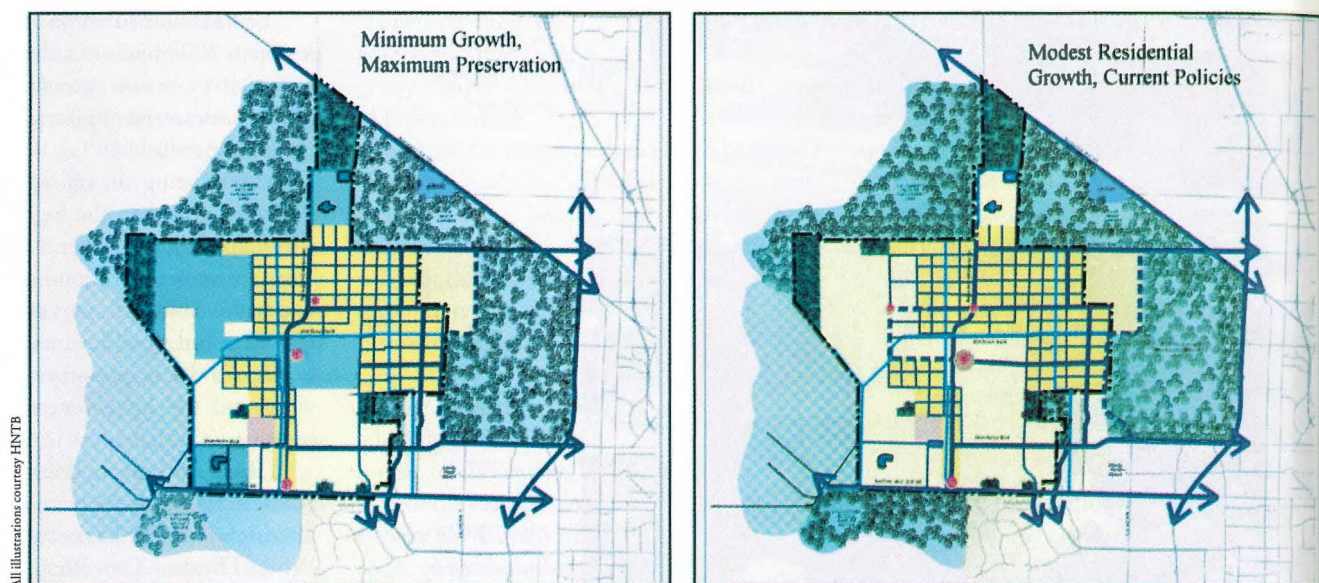


Getting Scenario-Building Right

By Uri P. Avin, FAICP, and Jane L. Dembner, AICP

Here is a dreaded but familiar scene: It's been and you believe the end of your comprehensive near. But then, during council hearings, people part in the public process raise a host of new



Three scenarios for a part of Palm Beach County, Florida.

Others who don't like your proposal coalesce into interest groups to push their own agendas. The process gridlocks, and the council throws the plan back to staff for reformulation. You have lost credibility and six months or more of hard work. Worst of all, council elections are looming and the whole process is about to unravel.

This tale is all too common. It has convinced us that a wide range of plan alternatives must be considered, and the effort must go beyond a bow to "visioning." Structuring plausible alternatives—building scenarios—that are credible and productive is a way to address this need. Here we propose a process, present some ex-

amples from our experience, and suggest some lessons for practitioners.

What is scenario-building?

What is a scenario? Kees van der Heijden, a leading business management theorist and practitioner, defines the concept this way: "Scenarios are a set of reasonably plausible, but structurally different futures."

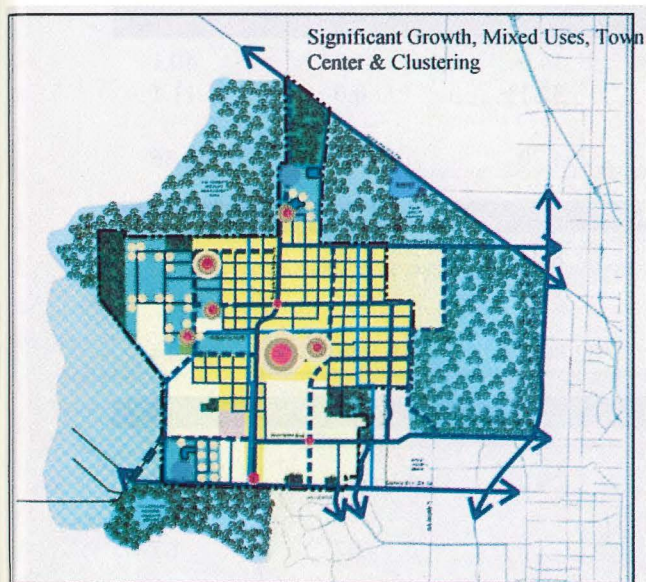
This definition makes scenarios quite different from "visioning" as it is typically practiced. Visioning asks people, "What would you like to see happen?" or "How would you like your community to look?" Such calls often raise false expectations and mask the tradeoffs involved, producing a lowest com-

mon denominator recitation of goals and objectives that may hide conflicting issues.

In scenario-building, the key question is: "What do you think might happen?" This question requires people to uncover and cope with forces that are driving change in their environment.

Scenarios must reflect an integrated, consistent storyline—an explanation of how an underlying reality can unfold under feasible circumstances. Plausible alternatives demand respect and objective analysis. Scenario analysis avoids obviously "good" or "bad" stories that favor some easy-to-defend option against straw men. This definition of a "scenario" challenges such easy comparisons as the typi-

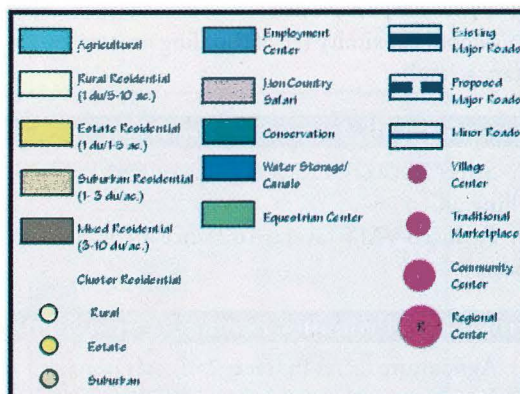
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Storyline 1, far left: Growth and build-out of the Central Western Communities is a bad idea because we don't want a suburban way of life. Instead, the county must use its wealth to acquire the development rights of major properties and offer incentives to lot owners to minimize their own build-out. In the long run, it will be cheaper for the county to buy development rights than to subsidize sprawl.

Storyline 2, center: People are satisfied with the way things are right now. Where else can you live on a two-acre lot, board your horses next door, and not have to deal with strip malls and congestion? Citrus groves are nice, but that land could be converted to five- to 10-acre lots. That approach would be compatible with the current environment, and it wouldn't stress our infrastructure and lifestyle. We would gladly drive 15 minutes for groceries and 30 minutes to work.

Storyline 3, left: Build-out under current plans will guarantee the worst of all worlds: low-density suburban sprawl. "Rural character" will be gone, and we will have increased population by two-thirds and added one million square feet of commercial services and a lot of traffic, all without benefit to our community or the county as a whole. Instead, we should allow a density consistent with approved plans for the general area. The result would be tightly clustered, planned communities with commercial services and jobs.



cal "compact versus sprawl" alternatives that are commonly generated and "tested."

A model from the business world

Planning textbooks advise us to generate alternative plans, to evaluate them, and then to select a plan or hybrid that satisfies the salient criteria. But such efforts often tinker with a few factors—slow, medium, or fast growth, for example—instead of examining fundamentals. Scenario-building demands a more rigorous structure and process.

Scenario-builders from the business world offer insights on how to fill this void in our planning practice. Many of the pioneers in this field were with Shell Oil in the 1970s,

when the firm explored and built alternative futures very different from the prevailing mindset. The strategists unearthed a number of seemingly obscure events that would serve as early warning signals of a major crisis in the oil production business. When these events in fact became reality, Shell cut back on a planned expansion of refining capacity. This shift allowed the company to ride out a turbulent period that crippled other industry giants.

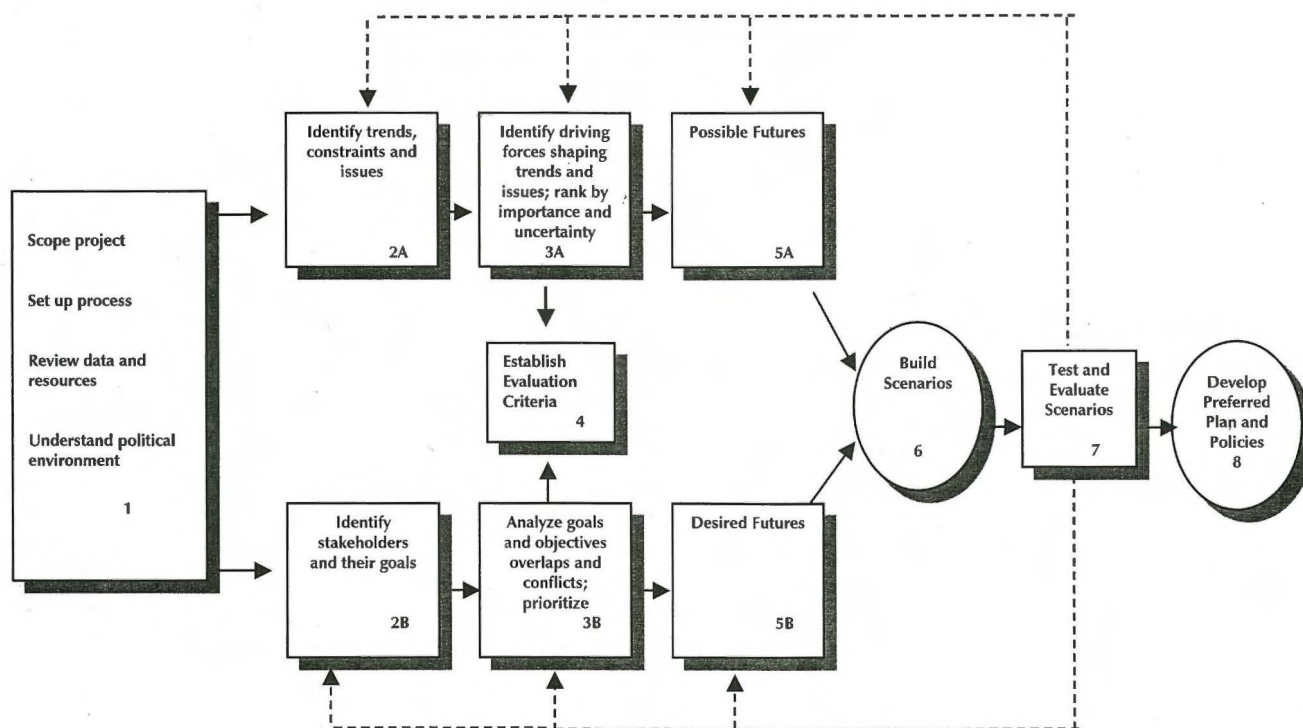
The Shell method distinguishes what is bound to happen ("predetermined" or "givens") from what might change ("uncertainties"). The "givens" hold for all scenarios. Various configurations of the major "uncertainties" are key to differentiating between

scenarios. This analysis of givens and uncertainties—a key activity—precedes the development of the scenarios. It seeks to go below current events, below apparent trends and patterns, down to an underlying structure. Scenarios then are created based on five driving forces: society, technology, environment, politics, and economics (STEPE).

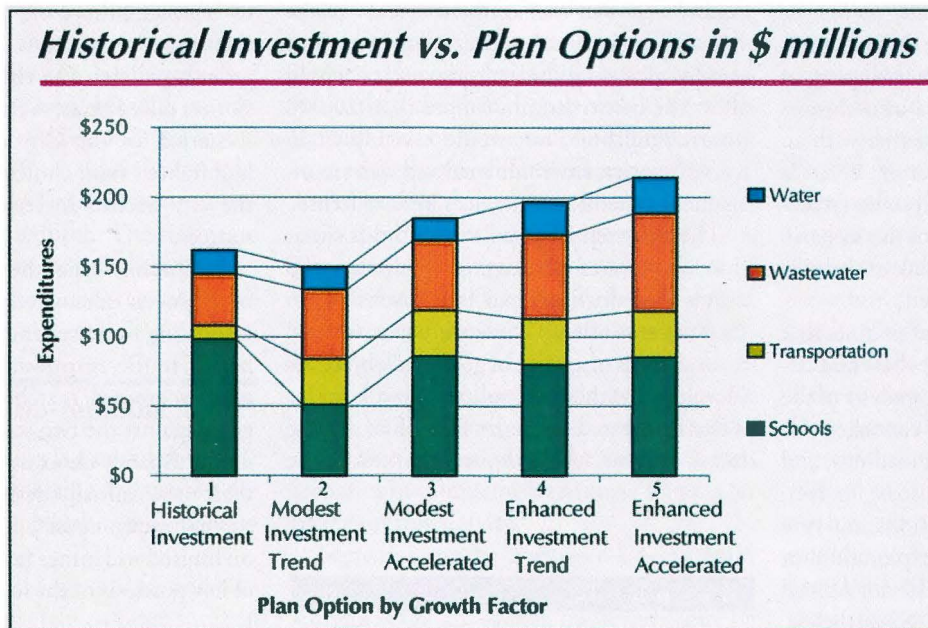
The emphasis is on understanding causes. The scenario clarifies how the external environment could change and therefore alter what is possible and what is considered immovable. Against each scenario, the company's "business idea"—a mental model of the forces behind its current and future success—is tested for robustness and resilience. Ultimately, this

	Minimum	Modest	Significant
Guiding Principle 1: Preserves Rural Character			
Indicator 1.1: Population Growth (% change from existing)	8%	61%	191%
Indicator 1.2: Gross Density (dwelling units per gross acre)	0.23	0.35	0.73
Indicator 1.3: Agriculture Retention (% of existing acreage retained)	82%	0%	28%
Indicator 1.4: Open Space (acres per dwelling unit)	1.75	0.38	0.31
Guiding Principle 2: Promotes Sustainable and Livable Communities			
Indicator 2.1: Balance of Uses (% of retail demand accommodated)	31.66%	40.21%	78.35%
Indicator 2.2: Walkability (% of dwelling units in mixed use centers)	1.11%	2.32%	41.51%
Indicator 2.3: Walkability (% of dwelling units in one mile of pedestrian/bike trails and greenways)	92%	92%	82%
Guiding Principle 3: Promotes Environmental Sustainability			
Indicator 3.1: Greenway Corridors (length in miles)	68	68	72
Indicator 3.2: Water Quality Impacts—Nitrogen (annual loading)	54,958	75,745	74,087
Indicator 3.3: Water Quality Impacts—Phosphorus (annual loading)	458,309	298,844	318,938
Guiding Principle 4: Manages Water Resources			
Indicator 4.1: Residential Water Consumption (Total MGD)	14.9	21.2	40.1
Indicator 4.2: Agricultural Water Consumption (Total MGD)	32.1	0.0	11.1
Indicator 4.3: Water Quality Impacts—Wastewater (septic tanks per square mile of developed area)	254.70	230.61	259.36
Guiding Principle 5: Provides Adequate Services and Facilities			
Indicator 5.1: Fire-Rescue Response Time	8.01	5.95	4.48
Indicator 5.2: Police Response Time	4.21	6.25	5.73
Indicator 5.3: School Proximity (% of dwelling units in two miles of an elementary school)	32.80%	33.40%	63.14
Guiding Principle 6: Minimizes Traffic Impacts			
Indicator 6.1: Street Network Efficiency (major road lane miles per 1,000 dwelling units)	9.7	14.85	9.95
Indicator 6.2: Reduced VMT (average distance for all residences to nearest grocery)	2.8	2.7	1.7
Guiding Principle 7: Promotes Economic Sustainability			
Indicator 7.1: Agriculture (acres in tracts 250 acres or more)	16,000	0	5,500
Indicator 7.2: Employment (total jobs)	6,800	8,500	27,700
Indicator 7.3: Ratio of Jobs to Labor Force	0.35	0.30	0.54
Guiding Principle 8: Promotes Fiscal Sustainability			
Indicator 8.1: County—Operating Costs to Revenues (per dwelling unit)	(\$370)	(\$383)	(\$89)
Indicator 8.2: Schools—Operating Costs to Revenues (per dwelling unit)	(\$1,803)	(\$1,742)	(\$1,033)
Indicator 8.3: Roads—Capital Costs to Revenues (per dwelling unit)	\$206	(\$1,975)	(\$258)
Indicator 8.4: Schools—Capital Costs to Revenues (per dwelling unit)	\$756	(\$1,249)	(\$1,204)

These indicators developed for a sector plan in Palm Beach County, Florida, attempt to quantify the Guiding Principles for three scenarios. This type of data should be reduced and simplified, preferably with graphics, for the public.



The process for scenario-building. Boxes 2A through 5A parallel the scenario-building steps of the private sector model, and produce a range of possible futures. Boxes 2B through 5B analyze the different goals and objectives of stakeholders, showing a range of desired futures. Conflicts within and between stakeholders goals and objectives should be explicitly acknowledged, and can become building blocks for different scenarios.



This analysis for Queen Anne's County, Maryland, shows that taking smart growth seriously will require more money than a softer commitment. Both scenarios showed commissioners that smart growth would require more money than historically spent on infrastructure, and with this and other information, the commissioners decided to raise taxes.

testing may cause the company to modify its business idea.

A new way to go

Businesses use scenario-building to survive and prosper in the face of uncertain futures. Planners, however, strive to temper uncertain futures in order to serve the public good. Businesses seek adaptability and flexibility in their strategies, whereas planners must implement policies—politically endorsed—in support of a preferred scenario.

Businesses have the luxury of developing and pursuing a unified and coherent business idea. Public planners must accommodate a wide variety of goals and ideas, even when they conflict with one other. Recognizing these important differences, we offer a process for public sector scenario-building.

To build planning scenarios, one must match a possible future with a desired future. Two parallel processes are involved, one that is objective and analytical and that sets limits on the range of possible futures, and another that reflects the desires of various interest groups. These processes are brought together so that the goals and objectives of various interest groups are aligned with complementary driving forces to produce possible scenarios.

In our model, goals and objectives are not derived, defined, and agreed upon up front to drive the process. Instead, problem identification and analysis will be done early on to help establish evaluation criteria for the scenarios. What drives the process is the grouping of conflicting goals and objectives into clusters of attitudes. Those clusters, together with an objective analysis of driving forces, create a range of plausible futures. Finally, when stakeholders make tradeoffs as part of the scenario evaluation process, the “real” goals and objectives of the plan are made explicit.

The scenario-building process assumes that stakeholders will modify their beliefs and behavior when they are shown an analysis of the outcomes of their particular, cherished futures. Based on our experience, readings, and discussions, we see that this does, in fact, happen. However, when positions are very hardened, even a thorough exploration of alternatives may not change behavior or lead to consensus or compromise. Nevertheless, the exercise almost always clarifies choices, allowing a coalition of interest groups to move forward.

Palm Beach County

Last year, HNTB assisted WilsonMiller, Inc., in initiating a sector plan for a 55,000-acre

area in Palm Beach County, Florida. Adjacent to the Everglades and to several protected reserves, these lands have been drained and partially cultivated as citrus groves. More than 17,000, 1.25-acre lots have been platted, and about half of these have been developed with on-site septic and well systems. Most roads are unpaved.

The key question is: ‘What do you think might happen?’

Old timers, including hobby farmers, equestrian enthusiasts, and more affluent newcomers, are determined to retain the area’s rural character. Citrus grove owners, who control 15,000 acres, are anxious about the future and want to retain development options. The county’s growth management system places this area in its rural and exurban tiers, but current planning and zoning policy would allow the construction of more than 20,000 homes. Full build-out would severely strain traffic capacity, environmental and water management systems, and services infrastructure.

The first step in grappling with this situation was to analyze existing conditions and trends that distinguished the “givens” from the “uncertainties.” These were then related to an analysis of a range of goals and objectives (developed with focus groups) to result in five scenarios created through a STEPE or driving forces analysis. (An in-house team test of the

scenarios’ plausibility is illustrated through their storylines.)

Scenario-builders, in using the STEPE process, must look beyond the boundaries of the study area or jurisdiction—or risk missing important parameters. For instance, the Palm Beach process could include the possibility of hurricanes, economic uncertainties related to an over-reliance on one segment of the economy, or a stronger federal role in the protection of the Everglades.

To minimize bias, the guiding principles used to test the scenarios were developed *before* the scenarios took shape. The scenario test results were presented in tabular form and graphics, wherever possible.

Five initial scenarios were developed. A peer review group recommended one additional scenario and the consolidation of two others. The final five scenarios were tested rigorously, applying travel demand modeling and fiscal assessment. Palm Beach County commissioners are currently pursuing the minimum development/maximum preservation scenario.

Other places, other ways

In two other locales, our comprehensive plans focused on the fiscal health of the community. In Queen Anne’s County, Maryland, we compared future scenario-based infrastructure investments with historical investments to highlight the costs of aggressively implementing the county’s long-standing smart growth policies. On this basis, the commissioners raised taxes. A fiscal analysis of several scenarios for the City of Suffolk, Virginia, highlighted stark choices and concluded that the city needed to seek additional funding sources.

In Dublin, Ohio, the comprehensive planning process exhaustively tested two scenarios (modeling for sewer and water, schools, fiscal health, traffic, stormwater impacts). An evaluation scorecard matched the city council’s goals against the two scenarios. The community ultimately chose a scenario less intensive than those initially developed—one that constrains future nonresidential development based on limited widenings (and therefore capacity) of key portions of the local road network.

Resources

Reading. Kees Van der Heijden, *Scenarios: The Art of Strategic Conversation* (1996), John Wiley & Sons. Peter Schwartz, *The Art of the Long View* (1996), Doubleday.

On the web. For more information, see http://planning.hntb.com/5_news.htm. Click on Noteworthy News, then Scenario building.

Lessons learned

Our process proposes a series of scenario-building tasks. But many practical questions remain. What follows is a set of best practice principles that draw on the lessons we have learned, the literature on this topic, interviews with clients, and discussion with experi-

enced scenario-builders (including Paul Sedway, FAICP, Paul Tischler, Bill Potapchuk, and John MacNamara, AICP). The principles address process first and then substance.

1. Get support from top leadership early on. At the very least, start with some expression of political support (public statements, a straw poll from the elected officials) for the scenario approach and process. Even better would be a task force that includes key elected officials, appointed officials (such as planning commission members), and department heads.

2. Keep the leaders involved. Briefings or work sessions with elected and senior appointed officials must occur at key points in the scenario process. These sessions will alert decision makers to the trade-offs. More importantly, the meetings allow them to air concerns and suggestions at all stages, not just during the formal public hearing process, when the political heat is the highest.

3. Seek diverse opinions. This will encourage innovative thinking and reality checks. Critics or skeptics, even outspoken opponents, should be part of any task force or steering committee. The staff technical team that will do much of the everyday work should include many different agencies (such as the city attorney and the directors of public works, economic development, and finance).

4. Define a clear mission. The task force's mission and authority must be defined up front and be ratified by the group itself. Is the role advisory, or will the group vote and approve? Responsibilities can be increased or decreased depending on available staff, money, and time. In most jurisdictions, we would advise using the task force (and subcommittees, if the group is very large) for brainstorming, critiquing, and feedback. The staff team should undertake the more arduous and time-consuming work on storylines, scenario-building, and evaluation.

When to do scenario-building

While scenario-building is a useful discipline for many planning problems, the process described here is most applicable in the following situations:

Where significant change is likely and outcomes are not obvious (e.g., a large surge in growth, the likelihood of major redevelopment, a military base closure).

When the time frame is medium to long term (10 to more than 20 years).

Where the community is heterogeneous and reflects different values and views of the future.

ing, and evaluation.

5. Set basic limits. Important questions about the scope and scale of the scenario process should be answered up front. These include: the timeframe being covered (10, 20, or 50 years?); which items elected or appointed officials might deem "off the table;" and the available resources. (Are staff, time, data, and resources adequate for a sustained analytical process? If not, can a shorter, non-quantitative effort yield any useful insights?)

6. Use SWOT productively. Planners frequently use a strengths, weaknesses, opportunities, threats (SWOT) framework to identify issues, often in breakout groups involving the public. In private sector strategic planning, where SWOT originated, the strengths and weaknesses are those of the organization itself, whereas opportunities and threats emanate from the outside. In our work on comprehensive plans, the strengths and weaknesses of the *current plan* take the place of the business organization, while the opportunities and threats remain external.

7. Get the maximum information from interviews. Conduct individual interviews of key stakeholders, including elected and appointed officials. Assure individuals that interviews will be confidential and, although notes will be taken, that no individual attributions will be made public. The interviews should be fairly informal, with open-ended questions and no more than two interviewers.

8. Highlight commonalities and differences. If objectives or strategies differ but share broad goals, then the shared goals should be highlighted. However, the analysis should not try to conceal genuine differences among the goals and objectives.

9. Establish evaluation criteria early on. Near the beginning of the process, the core team and stakeholders should establish a set of measures against which the ultimate plan can be judged.

10. Recognize that there is more than one way to build scenarios. The *possible*, as well as the *desired* futures, should be combined into scenarios in complementary ways. There is no recipe for this activity.

Scenarios can be built step-by-step from the data and can emerge without an initial storyline. Or an overall framework can be created as a first step and pieces of evidence fitted into the framework. Or one can start with the "official future" and make excursions into surrounding territory. Several team workshops will be needed to shape the scenarios.

11. Test the storylines for plausibility. The storylines must be developed with a begin-

ning, middle, and end. Once sketched out, they should be tested for plausibility by being quantified (how would growth of various kinds be distributed and other differences made meaningful?) and role playing (take account of different perspectives to check whether the storyline is consistent with an actor's likely behavior).

12. Limit the number of scenarios and clearly differentiate them. Three or four scenarios usually suffice, but they need to offer strongly contrasting futures reinforced by memorable names. One scenario typically scores higher on evaluation criteria than others do. But the preferred scenario (upon which the final plan is based) often borrows features and policies from the other scenarios.

13. Don't go public prematurely. Both staff and stakeholder groups should, at a minimum, complete tasks one through six before bringing their work to the public. These initial steps include a STEPE analysis, defined storylines and graphics, and enough quantitative analysis to answer basic questions on the allocation of future growth or redevelopment.

14. Evaluation should include fiscal testing. It is essential for elected officials and stakeholders to understand the fiscal impact of their ideas. If the scenario covers a short period (say 10 years), a marginal cost approach is better than an average per capita one.

15. Allow enough time and resources. Everyone must be aware of this point so that expectations are not out of line with the real effort needed to execute the work.

Worth the effort

Although scenario-building lengthens the planning process, we find that planning managers, citizen planners, and consultants believe that the effort is invaluable to the ultimate plan and its adoption and implementation.

Asked a few years after the plan was adopted if the process and timeline were worthwhile, Dave King, chair of the Dublin, Ohio, steering committee, said this: "It couldn't have worked any other way. The arguments would not have been based on real information; they would have been subjective. People wouldn't have believed the numbers. The testing and alternatives provided options and benchmarks for comparison."

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