Planning for Sustainable Development:
Measuring Progress in Plans

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Abstract

This study sets forth a set of six principles that define and operationalize the concept of sustainable development. Using these six principles, a sample of 30 comprehensive plans is evaluated to determine how well the policies of plans support sustainable development. Findings indicate no significant differences in how extensively sustainability principles are supported between plans that state an intention to integrate sustainable development and those that do not. In addition, plans do not provide balanced support of all six sustainability principles, as they support one principle significantly more than others.

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Introduction

Sustainable development has been touted as a new planning agenda (Beatley and
Manning 1998). Critical global environmental issues of greenhouse gas emissions and
loss of biodiversity have led to increased advocacy for more sustainable land use
practices (Vitousek et al. 1997). Various states (Florida, Minnesota, New Jersey,
Virginia) have initiated sustainability programs to mobilize communities to alter
landscape development practices dominated by sprawl (Krizek and Power 1996). The
President's Commission on Sustainable Development has promoted the concept through
the funding of local planning demonstration projects. Countries like Canada, Holland and
New Zealand have adopted national legislation mandating that local plans and
implementation actions integrate key principles of sustainable development (Berke,
Dixon and Ericksen 1997; May, et al. 1996; Mega 1996; Roseland 1992).

Given the increasing weight of responsibility the public has placed on plans in advancing
sustainable development, we should be able to determine if plans are making progress.
While the verbiage about sustainable development is overwhelming, there is little
empirical evidence on the extent to which plans promote it.

This paper uses a sample of local plans to examine the influence of the sustainable
development concept on plans. The sample consists of plans that explicitly incorporate
the sustainable development concept and those that do not.

Two basic questions are addressed: (1) Are plans that use sustainable development as an
organizing concept more likely to promote sustainability principles than plans that do
not?; and (2) Do plans achieve balance by supporting all sustainability principles, or do
plans narrowly promote some principles more than others? Answers to these questions
will provide insight into the particular case of creating high quality plans, but also to the
general challenges of advancing the vision of sustainable communities.

This paper first derives a set of sustainable development principles to serve as a
framework to guide plan evaluation. It then presents a method for measuring progress in
how well plans advance these principles. Next, we apply the method to a sample of local
comprehensive plans to compare plans that use sustainable development as an organizing
concept to those that do not, and to assess how well plans promote diverse sustainability
principles. Finally, we set forth conclusions and implications for planning as a means for
creating sustainable communities. Future research needs are discussed, as well.

Defining Sustainable Development

What is sustainable development? The 1987 report, *Our Common Future,* of the United Nations World Commission on Environment and Development (WCED), sets forth the most widely used definition of the concept indicating that "Sustainable development is development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs" (1987: 1). The central goal is intergenerational equity, which implies fairness to coming generations.

To achieve this goal the commission attempted to weave together multiple societal values to confront the dual challenges of reducing over-consumption and grinding poverty. These values are sometimes referred to as the "three Es" of sustainable development: environment, economy, and equity. The WCED recognized that the conventional economic imperative to maximize economic production must be accountable to an ecological imperative to protect the ecosphere, and a social equity imperative to minimize human suffering.

On the surface, sustainable development is a simple concept: current and future generations must strive to achieve material comfort that is equitably distributed and within the limits of natural systems. Despite this simplicity, there is no general agreement on how the concept should be translated to practice. While there is no question that the concept is increasingly being used to guide planning, the concept's meaning is not immediately obvious. Beatley and Manning (1998) argue that within the planning profession, "There is a general sense that sustainability is a good thing, but will…require definition and elaboration, as do terms such as freedom and quality of life" (1998: 3). Other observers are more critical. Campbell (1996) maintains that the "current concept of sustainable development, though a laudable holistic vision, is vulnerable to the same criticism of vague idealism made against comprehensive planning…" (1996: 296).[1] Andrews further observes "sustainable development is primarily symbolic rhetoric, with competing interests each redefining it to suit their own political agendas, rather than serving as an influential basis for policy development" (1997: 19).

While these perceived shortcomings have some legitimacy, there are emerging efforts focused on translating the concept to planning practice. An examination of various definitions from the literature in planning scholarship and practice reveals key characteristics that can be used to derive a more precise definition (Beatley and Manning 1998; Campbell 1996; Kaiser, Godschalk, and Chapin 1995; Mega 1996; Neuman 1999). One characteristic is "reproduction." Planning scholar Scott Campbell defines sustainable development as "the long-term ability of a system to reproduce" (1996: 306). We consider Campbell's notion of "reproduction" to be not just duplication of the status quo, but also to fostering revitalization. Accordingly, planners must foresee and shape the scope and character of future development, identify existing and emerging needs, and fashion plans to assure that those needs will be met and that communities will be able to continuously reproduce and revitalize themselves. By this definition, built environments

become more livable; ecosystems become healthier; economic development becomes more responsive to the needs of place rather than furthering the profits of a powerful few; and the benefits of improved environmental and economic conditions become more equitably distributed.

A second characteristic is "balance" among environmental, economic, and social values (Kaiser, Godschalk, and Chapin 1995; Neuman 1999). Kaiser and his colleagues argue that plans should reflect an appropriate balance among these sometimes competing, sometimes complimentary values. Achievement of balance usually entails coordination, negotiation and compromise. When all values are not represented, then sustainability cannot be promoted by a plan. If environmental values are not accounted for, then the basic life support process upon which a community depends cannot be sustained. If economic development values are not represented, then the fundamental source of community change and improvement cannot take place. If social values are not reflected in a plan, then places will be created that do not meet life and work needs of local people, and do not fairly serve all interest groups.

A third characteristic is that plans must "link local to global concerns" (Mega 1996). Sustainable development requires that communities reach beyond their individual interests in future development to account for global (and regional) needs. Local plans should acknowledge that communities function within the context of global (and regional) environmental, economic, and social systems. Moreover, just as communities should not act in their own interests, individual citizens and interest groups should be required to account for community, regional, and global interests.

A fourth characteristic is that sustainable development is a "dynamic process" that extends from the formulation of a plan. Sustainability requires communities to pursue an evolving and ever-changing program of activities, including a continuous process of evaluating current and emerging trends, an ongoing means of encouraging citizen participation and negotiating conflicts, and an updating of plans. These activities should be oriented toward searching for ways to continuously move in the direction of becoming more sustainable.

In sum, the literature on sustainable development has made substantial strides in defining the key characteristics of the concept that are relevant to the theory and practice of planning. For our purposes of evaluating plans, we use these characteristics in developing the following working definition:

> Sustainable development is a dynamic process in which communities anticipate and accommodate the needs of current and future generations in ways that reproduce and balance local social, economic, and ecological systems, and link local actions to global concerns.

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This definition provides a basis for deriving a more refined and comprehensive set of sustainable development principles for guiding an evaluation of local comprehensive plans.[2] Because plans reflect substantive (or technical) policy outcomes of planning, but do not fully account for procedural dimensions, the focus of this study is on the substantive principles of sustainability. Thus, the fourth characteristic of sustainability (dynamic process) will not be examined.

Given our definition of sustainable development, and the task of constructing a set of operational performance principles for evaluating local comprehensive plans, we offer six basic principles. All retain an explicit connection to the location, shape, scale, and quality of human settlements. None of them are narrow; all refer to clusters of qualities. Yet each principle has a common basis and may be measured in a common way.

The principles are:

1) *Work in harmony with nature.* Land use and development activities should support the essential cycles and life support functions of ecosystems. Whenever possible, these activities should mimic ecosystem processes, rather than modify them to fit urban forms. These activities must respect and preserve biodiversity, as well as protect and restore essential ecosystem services that maintain water quality, reduce flooding, enhance sustainable resource development.

2) *Livable built environments.* The location, shape, density, mix, proportion, and quality of development should enhance fit by creating physical spaces adapted to desired activities of inhabitants; encourage community cohesion by fostering accessibility among land uses; and support sense of place to ensure protection of special physical characteristics of urban forms that support community identity and attachment.

3) *Place-based economy.* A local economy should strive to operate within natural system limits. It should not cause deterioration of the natural resource base, which serves as a capital asset for future economic development. Essential products and processes of nature should be used no more quickly than nature can renew them. Waste discharges should occur no more quickly than nature can assimilate them.

The local economy should also produce built environments that meet locally defined needs and aspirations. It should create diverse housing, and infrastructure that enhances community livability and the efficiency of local economic activities.

4) *Equity.* Land use patterns should recognize and improve the conditions of low-income populations, and not deprive them with basic levels of environmental health and human dignity. Equitable access to social and economic resources is essential for eradicating poverty and in accounting for the needs of the least advantaged.

5) *Polluters pay.* Polluters (or culpable interests) that cause adverse community-wide impacts should be required to pay, taking into account that the polluter must bear the cost of pollution and other harms, with due regard to the public interest.

6) *Responsible regionalism.* Communities should not act in their own interests and should account for the consequences of their actions on others. Just as individual developers may be subject to the polluter (or culpable) pays, a local jurisdiction has an obligation to minimize the harm it imposes on other jurisdictions in pursuit of its own objectives.

In this conception of sustainability, principles one through four are associated with the "reproduction" characteristic, since they address the long-term ability of a community to sustain healthy local social, economic, and ecological systems. Principles five and six reflect the "link local to global concerns" characteristic, wherein communities (and individuals) act with a broader obligation to others. How well all six principles are represented by plan policies relates to the "balance" characteristic.

We next develop a content analysis method for evaluating the extent to which plans advance these principles. We first identify the principles promoted by plan policies of each plan, and then rate the extent to which the policies promote the principles. Admittedly, this approach is somewhat mechanistic and may not embrace the synergistic qualities that are frequently present in good plans. Nevertheless, it identifies principles that are accounted for, and provides an analytical framework to compare plans from diverse communities.

Sample and Plan Evaluation Method

The first phase of this study focused on identifying a study population, and selecting a sample of local plans. The next phase was to develop and apply a method for evaluating the extent to which plans integrate the principles of sustainable development.

Sample

An exploratory approach was used in developing the study population of community plans. The initial task was to identify two groups of plans: those that explicitly used sustainable development as an organizing concept for plan preparation; and those which do not use the concept but have been noted as producing high-quality plans. The sustainable development plans were identified using the following procedure. Through

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federal agency reports (i.e., EPA and HUD), three newsletters of sustainable development organizations, sustainable community conference proceedings, and one computer mail list server, 105 communities that potentially used the sustainable development concept in their plans were identified.

To assure that the plans reflected contemporary practice, only plans that were prepared between 1985 and 1995 were used. Smaller jurisdictions were considered to lack the resources to initiate even a minimum planning effort, so communities of less than 2,000 population were excluded. Communities over one million in population were also excluded. The types of urban planning programs in such large cities were considered unique and not generalizable to the study population. The population size parameters reduced the study population to 85 plans. A plan was then obtained from each of the 85 local jurisdictions.

An initial content analysis was then conducted to determine how the sustainable development concept was used in these plans. Results indicated that the concept was used as an overarching framework for guiding the preparation of 10 plans. Six of these plans included the core values of sustainability (environmental, economic, and equity) into an introductory vision statement which served to guide the formulation of goals and policies in subsequent plan elements. Four plans did not include a vision statement, but contained language that consistently referred to the core values of sustainable development and translated these values into policies throughout the plan.[3] While this total is somewhat lower then we expected, the communities show considerable variation in geographic location and population size.[4]

We used the remaining 75 plans from the study population as a basis for selecting a sample of high quality plans that that did not use the sustainable development concept. We considered these plans to be high-end efforts for several reasons. First, many plans were APA award winners at the national or state chapter level. Second, all were documented in agency reports or professional practice journals as commendable plans that tackle a range of substantive issues, including, for example, natural resource protection, inner city redevelopment, growth management, urban design, and social justice.

A group of 20 plans was then randomly selected from the remaining plans. As an indicator of the quality of this high-end group, 10 received national or state chapter awards from the American Planning Association. All others were documented in the literature as being high-end efforts. No significant differences in population size, growth rate, and presence of state mandates for local planning were detected between the high-end group of plans and the sustainability group.[5] The sample thus provides the basis for comparing plans that integrate sustainable development with those that do not. The question is whether plans that integrate the concept advance sustainability principles more than plans that do not. Determining the contribution of the sustainable development concept to a plan's policies and implementation strategies is of major interest.

Plan Evaluation Method

The next phase was to develop a method for evaluating the extent to which plan policies promote sustainable development principles. This entailed development of a plan evaluation protocol that required three items of information from each policy statement. First, each policy was classified based on the sustainable development principle promoted by the policy. The principle was identified based on the goal that was linked to a given policy and/or the rationale to support the policy that was included in the text of the plan. Second, the type of development management technique (e.g., zoning and subdivision regulations, and capital facility program) stipulated by each policy for promoting a given principle was identified. Table 1 shows six categories of techniques included in the protocol. Third, each policy was evaluated as: 1 = suggested in plan; and 2 = required by the plan. Policies that are "suggested" consisted of key words such as encourage, consider, intend or should. Policies were considered "mandatory" if they contained words such as shall, will, require or must. Table 2 illustrates three examples of how the evaluation method is applied to our sample of comprehensive plans.

To increase reliability in plan evaluation, the protocol was pre-tested. Members of the research team (a graduate student and the two authors) independently applied the protocol to the same plan and compared results. The team evaluated several trial plans, each time comparing results, resolving differences in interpretations, and refining the protocol. This process was continued until the team was satisfied that interpretations of principles, development management techniques, and the regulatory versus voluntary orientation of policies were standardized, and plans could be evaluated consistently.

Plans were then evaluated by two coders working independently of each other.[6] An inter-coder reliability score was computed which equaled the number of coder agreements for plan policies, divided by the total number polices. An overall reliability score of 84 percent was achieved for plans that were double coded. A score in the range of 80 percent or above is generally considered acceptable (Miles and Huberman 1994).

The three items of information for each policy statement that were derived from the evaluation were then used to create indices of each sustainable development principle for each of seven plan elements (housing, transportation, environment, energy, land use and design, economic development and public facilities).[7] Computation of each index consisted of two steps. The first step involved summing the scores assigned to policies under each principle within each element. Higher summated scores indicate use of more policies and development management techniques to promote a particular sustainability principle, which represents a higher level of community commitment and activity devoted toward achieving a given principle. The second step was to standardize the indices by dividing the sum of scores by the maximum possible score and multiply by 10.[8]

Does Sustainable Development Make a Difference?

Table 3 indicates mean and total scores of sustainability principles for each plan that integrates the sustainable development concept and for each plan that does not. Plans exhibit considerable diversity in total scores within each group, with scores ranging from 9.7 to 54.6 in the group that integrates the concept, and from 7.1 to 63.1 in the group that does not.[9] Findings also indicate a diversity in ways both groups advance the sustainability principles. The two highest scoring plans (Jacksonville and Portland) illustrate this point. The Portland plan has the second highest total score of all plans in both sample groups. This plan strongly promotes multiple principles by weaving together policies from all plan elements to create a comprehensive compact urban form strategy. The sustainable development concept is used as an overarching, integrative framework for guiding the creation of this strategy.[10] Alternatively, the Jacksonville plan does not acknowledge the sustainable development concept, yet scores the highest of all plans in both sample groups. The principles in this plan are strongly advanced on a piecemeal basis, with separate plan elements oriented toward advancing one or two principles. The housing element, for example, emphasizes advancement of the equity principle through housing affordability and neighborhood revitalization policies. The environmental element promotes the place-based economy and livable built environment principles through emphasis on greenway and open space preservation.

These findings from our descriptive assessment of individual plans appear to suggest that plans which integrate the sustainable development concept are no different from plans that do not. This observation raises the question of whether use of the sustainable development concept makes a difference?

To answer this question the next analysis provides a composite assessment that compares the extent to which both groups of plans promote sustainable development principles. Table 4 compares total scores of plans by sustainability principle between each group of plans, and compares means for each principle by plan element. Most notably, whether plans integrate the sustainable development concept or not has a very limited affect. None of the total scores for the principles are significantly different between groups. A closer inspection of mean scores by plan element reveals little variation, as well. Four of the seven plan elements (housing, energy, economic development, and public facilities) have no significant differences between groups for all principles, two elements (transportation and environment) each have three principles that are significantly different, and one element (land use) has one principle that is significantly different.

In sum, use of the sustainable development concept as an organizing framework appears to have no affect on how well sustainability principles are implemented in the policies of plans. Several reasons may explain why our findings indicate that the concept has not had a stronger impact on plans. One is that "code words" for sustainable development may not be politically acceptable in many communities, but the principles, being less well known, would be accepted as common sense. Thus, some high scoring plans that

incorporate the principles but do not use the "code words" are not included in the group of plans that integrate the concept.

A second reason is that one person writing and developing the plan can make a significant difference. The individual may be convinced of the importance of sustainable development, but may not be able to get interest groups to agree to the idea. In this case, the individual may not have used the "code words" for sustainability, but worked the sustainability principles into policies where they are more hidden and based on common sense. Plans may thus receive higher sustainability scores due to committed plan authors, but they were not included in the sustainability group of plans.

A third reason could be that planners who wrote the plans did not have an in-depth exposure to sustainability concepts, since plans in our sample were adopted between 1984 and 1995 and planners writing plans were probably out of school a minimum of three to five years. Consequently, plan authors may not have had the capability to effectively integrate the concept into policies even if they used "code words" for sustainability in plans. This inability may partially explain the insignificant differences between the two groups of plans.

While initial findings indicate that the sustainable development concept has not yet had a significant impact on plan making, we contend that the concept is still useful as an overarching guide for evaluating how well plans achieve a balanced approach to managing development. Findings derived to answer the second question posed earlier demonstrate the usefulness of the concept.

Do Plans Provide Balanced Support of Sustainable Development?

Table 4 indicates that some sustainability principles are more advanced than others. Within each group, mean scores for each of the plan elements are significantly different across the six sustainability principles, with the exception of the energy element. To further explore this issue, Table 5 compares the mean of the highest scoring principle for each plan element with the mean score of the remaining five principles of each plan element. The mean scores of both groups of plans were pooled since there are no major distinctions between groups in comparing highest principle scores with pooled scores of other principles.

Two major findings were derived from this analysis. First, plans most strongly advance the livable built environment principle. This principle had the significantly highest mean scores for five of the seven plan elements (transportation, environment, energy, land use and design, and public facilities). This finding suggests that plans contain integrated strategies that promote the livable built environment principle. Transportation elements of plans, for example, often emphasize congestion reduction through infrastructure investments and market incentives that support non-auto forms of access, transit site locations, and pedestrian friendly streets. Land use elements focus on manipulating

density, proportion, mix, compatibility, and scale of commercial, civic and residential development to achieve livable built environment goals, such as enhancing pedestrian access among land uses, fostering civic engagement in public and private spaces, and protecting special qualities of the built environment to support community identity and sense of place. Environmental elements emphasize livable built environment needs, rather ecological integrity. For example, policies in the environmental element of Pittsburgh's comprehensive plan emphasize use of zoning regulations in landslide prone areas "to assure development can proceed safely," and land acquisition by the public sector "to promote increased public riverfront access opportunities" (Pittsburgh Department of City Planning 1993: 8). The primary goal of the environmental element of Portland's plan is to "Enhance the sense Portlanders have that they are living close to nature" (Portland Bureau of Planning 1995: 95). Subsequent policy statements are consistent with this goal as they support neighborhood parks and greenways that are intended to improve urban livability. However, both of these plans give significantly less attention to hydrologic, nutrient, and wildlife flows that are inherent to landscape ecological integrity and to supporting the working with nature principle.

Second, the remaining sustainability principles received less attention from plan elements. The working with nature principle did not receive the highest score for any element. The equity principle had the significantly highest mean score in the housing element, but was not strongly promoted by the remaining plan elements. Although housing elements have a long tradition in promoting affordable housing programs for low-income people (Connerly and Muller 1993), comprehensive plans do not extend beyond this conventional practice in seeking to promote the equity principle.

Similarly, the place-based economy principle had the significantly highest score in the economic development element, but received low scores from other elements. Economic development elements typically included policies that promoted infrastructure investment strategies that support private sector investments. These elements frequently set forth policies that support local entrepenuership (e.g., property tax abatement schemes, impact fee waivers, zoning regulations that encourage proximity of supportive residential markets). In a few cases, other plan elements support the placed-based economy principle. The Teton County, Wyoming housing element promotes affordable housing to avoid local labor force shortages. The Honey Brook, Pennsylvania land use element includes farmland preservation policies to support local food production. The Davis, California energy element provides tax credits for energy saving building designs for the explicit purpose of fostering local economic self-sufficiency. However, these examples are the exception to common practice.

Finally, all plan elements place very limited attention on the polluters pay and responsible regionalism principles. These findings were not unexpected. Prior research based on large samples of plans indicates that plan polices overwhelmingly rely on the conventional regulatory approach to guiding development (Berke, et al. 1996; Burby and May, et al. 1997; Manta and Berke 1998). Policies that require markets to account for all costs

through price adjustments (e.g., pollution taxes, infrastructure impact fees, marketable non-point source pollution allowances) are only used on a limited basis. Moreover, given the weak regional governance arrangements in the US, it is not surprising that local plans give little attention to the responsible regionalism principle. Without strong regional authorities in place, there is little incentive for individual communities to account for extra-local impacts made by individual developers and local governments.

Conclusions and Implications for Practice and Future Research

Our study offers several findings on the role of sustainability in creating plans that promote more sustainable places. One indicates that the concept has no affect on how well plans promote sustainability principles. Interpretation of this finding is mixed. On the one hand, this finding bolsters the frequent criticism that the sustainable development concept is superficial, lacks political commitment, and cannot serve as an influential basis for policy development. On the other hand, the concept is viewed as highly relevant to planning. Supporters contend that sustainable development offers a concrete vision for a new planning agenda, and thus has generated widespread appeal.

As noted, many communities are now embracing the concept, but their planners may only have a superficial understanding of how to translate it to practice, and their interest groups may be skeptical of this new idea. Campbell, for one, argues that "In the battle of big public ideas, sustainability has won: the task of the coming years is simply to work out the details and to narrow the gap between its theory and practice" (1996: 304). Thus, sustainable development might best be viewed with optimism, but not without consideration of the caveat that a deeper understanding of how to operationalize the principles of sustainable development is needed.

A second major finding of this study demonstrates the potential utility of the concept by indicating that plans do not take a balanced, holistic approach to guiding development and moving toward sustainability. Instead, they narrowly focus on creating more livable built environments, which is the historic mainstream focus of plans (Kaiser, Godschalk, and Chapin 1995; Kent 1990). Findings further show that plans have not branched out into non-traditional subject matter involving a host of other sustainability principles (e.g., equity, working with nature, place-based economy, polluters pay, and responsible regionalism).

This finding begins to reveal that new and more expansive directions must be taken to fundamentally reform how planning practice approaches plan making. However, unless the planning field is able to go beyond the symbolic rhetoric and create more holistic plans that help communities move in the direction of sustainability, then critics will be right—sustainable development will be nothing more than just another popular fad to make its way into the planning field. Even worse, association with an unworkable concept could detract from the credibility of planners in their attempts to influence future

local land use polices. It might also draw down limited staff and fiscal resources of local planning agencies that could have been used for other more productive activities.

Planners clearly have a critical role to play in promoting the dialogue about sustainability and in conceiving concrete public policy solutions that promote community sustainability. The profession must confront and overcome John Levy's warning that planning "does not seem to have any guiding principle or central paradigm. The comprehensive plan lost its dominance several decades ago and nothing has come along to replace it" (1992: 81).[11]

What actions can planners take to engage the challenge of sustainable development in the crafting of comprehensive plans? One recommended action originally offered by William Lucy is that "community sustainability…should be incorporated as a fundamental aspect of planning education…and should be an axiom of planning" (1994: 306). Planning educators and professionals must take a more expansive view of comprehensive planning. The concept offers a new paradigm about where the profession of planning should aim. A key activity should be a strong focus on the decision-making process. Planners must employ various negotiation and dispute resolution techniques that are essential in formulating holistic development management strategies needed to achieve balance among sustainability principles. This entails resolving the classic conflicts among the primary goals of sustainable development (i.e., "jobs versus environment," "income equality versus growth and efficiency," "environment versus equity"). The independent effects of the techniques on how well plans promote sustainability principles need close scrutiny and future study. Another key activity involves promotion of a substantive vision of sustainability through creative use of land use, architectural, and technological solutions (Campbell 1996).

A second recommended action leads to adoption of state planning mandates, which require communities to adopt plans that support principles of sustainability. Prior research suggests that the presence of state planning mandates has a strong influence on the content and quality of local plans. A study by planning scholar Raymond Burby and his colleagues found that state planning mandates have a strong positive impact on the quality of natural hazard mitigation elements of plans (Berke and French 1994; Berke, et al. 1996; Burby and May et al. 1997), and on local government adoption of development management tools that are consistent with plans (Dalton and Burby 1994). Deyle and Smith (1998) found that implementation effort of a state mandate has a significant impact on plan quality and plan compliance with state goals. These studies also found that state mandates are important because they overcome local political opposition to planning. State mandates could thus help local governments to go beyond the rhetoric of sustainable development by requiring local adoption of plan policies that promote balanced and mutually reinforcing sustainable development principles. The current emphasis on livable built environments could be converted to a more holistic view of community development.

A third recommendation is that planners must examine the linkage between plans, implementation efforts, and the sustainability of outcomes. We agree with Talen (1996) that evaluation of the performance of plans warrants more investigation than is found in the literature. If planning is to play a significant role in advancing sustainable development, then more effort needs to focus on understanding the relationships within the continuum from state mandates (and incentives), to plans, to regulations, to standards, to outcomes. The focus should move from rhetoric to hard, relevant information. Better information about outcomes would be a useful to assess progress that communities are making toward sustainability, and evaluate the performance of mandates, plans, and implementation efforts. Better information would also improve the ability and legitimacy of planners, and give them an advantage over other competing special interest groups in promoting the more holistic sustainability concept.

Finally, an evaluation of the efficacy of sustainable development concept requires future research similar to our study. As noted, the introduction of the sustainable development concept into planning practice is relatively recent, which necessitates considering this as an initial assessment. A full assessment of the efficacy of the concept requires a larger sample of plans as more communities attempt to build on the experiences of prior initiatives in community plan making like those reported in this study.

In sum, sustainable development has become a highly visible idea in public policy debates. This concept has been touted as an overarching framework for helping communities to recognize the links among economy, environment, and equity. Governing these issues separately can be costly, and may result in unwanted consequences.

The task ahead is to narrow the gap between theory and practice. This study represents an initial step in carrying out the task. We argue that planners and their communities must go beyond symbolic use of the sustainable development concept in seeking comprehensive development guidance strategies that balance core values of diverse interest groups. We offer future directions the planning field should take to clarify the role of planners in creating comprehensive plans that foster community sustainability.

However, we must express caution that the path toward sustainability is a long one, with few "quick fixes." The complexity of the task at hand demands a holistic and carefully considered approach. The task rests largely with the practitioners and scholars of the planning field.

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[1] Campbell (1996) also contends that the criticism of vague idealism made against plans was most prevalent some 30 years ago. The criticism still holds in contemporary planning practice. Baer (1997) contends that while there is considerable "naive enthusiasm" about the benefits of plans, especially by state planners who often express considerable optimism about mandated local plans and their outcomes.

[2] We recognize that other dimensions of plans are critical to achieving sustainability (e.g. goals, quality of fact basis that supports policies, monitoring and evaluation of sustainability indictors, and procedural validity regarding public participation). Analysis of these dimensions will be undertaken as part of our broader study of plan quality and sustainable development. Nevertheless, the focus on policies presented in this paper represents a critical dimension of plans in that policies are the critical part of plans that guide day-to-day and long-range decision making about land use and urban form.

[3] The six communities with plans that have a vision statement which frames how a community translates the concept to planning policy include: Kansas City; Lincoln, NE; Portland, OR; San Antonio; Teton County, WY; Seattle. The remaining four communities that fully integrate sustainable development include: Burlington, VT; Chattanooga, TN; Livingston, MT; San Jose, CA.

[4] The communities that produced sustainable development plans are located in 10 states as indicated in Table 2 of this paper. These communities are equally distributed in population size across a range from about 20,000 to 900,000 people.

[5] No significant differences were detected when we compared means for population size (t-test = 1.44, p = .16) and population growth rate 1980-90 (t-test = 1.56, p = .12) between the sustainability group and high-end group of plans. No significant difference was found between the two groups in the percent distribution of communities that were required to plan under a state mandate compared to communities were not required to prepare a plan (Chi-Square = .714, p = .40).

[6] Given the extensive amount of time required to content analyze the plans (approximately 20 hours per plan), four of the 30 plans were double coded. Initially, the two coders content analyzed the first two plans to assure that the plan evaluation protocol was a reliable coding instrument. To assure consistency in coding throughout the coding process, two additional plans (tenth and twentieth plans that were coded) were coded, as well

[7] In some cases, a plan did not include a particular element as a stand-alone chapter. In these cases, a score of zero was assigned to the missing element. In other cases, an

element was embedded within another element. For example, the Lincoln City-Lancaster County Comprehensive Plan did not include a separate housing element (Lincoln City Department of Planning 1994). However, a subsection titled "Housing Affordability" was included in the land use element. In this case and in other similar cases, we coded the subsection as a stand-alone element.

In addition, the sample of plans did not contain additional elements not included in our seven categories of elements. Given the breadth of topics covered by these categories, we did not encounter plans that contained additional topics (and elements to cover those topics).

[8] The maximum possible score for each principle under each element is 62. As noted, there are 31 development management techniques under each element (see Table 1), with each technique having a maximum score of 2.

[9] The individual scores for each principle in Table 2 was computed by summing the standardized scores of each principle across all plan elements for each plan. The total score was computed by summing the score of all principles.

[10] The Portland plan vision statement serves to guide the formulation of goals and policies in the subsequent elements. The vision statement uses the term "livability" to convey the sustainable development concept. "Livability" is explicitly tied to sustainable development based on a discussion of intergenerational equity. The degree of livability of a place is affected by actions of people from seven generation back in time. The "seven generation" philosophy discussed in the plan is borrowed from Native American's notion of sustainability. That is, the use of the land use resource base by the current generation will affect level of livability of the land for the next seven generations.

[11] The quote from Levy (1992) was originally taken from Lucy (1994: 305).

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Table 1: Policy Categories of Growth Management Measures

Policy Categories	
1. *Land Use Regulation* Density Permitted use Special study zone Sensitive area overlay Subdivision Site review Local environmental impact statement	4. *Financial Incentives* Impact fees Reduced taxation Bonus zoning Exaction Land trust funds
2. *Property Acquisition* Transfer of development rights (TDR) Acquisition of land Acquisition of development rights Land bank Acquisition of development units	5. *Building Codes and Standards* Standards for new buildings Standards for retrofitting existing buildings
3. *Capital Facilities* Phased growth Concurrency Location of capital facilities Urban service boundary Annexation	6. *Public Education and Awareness* Builder workshop Public education program (job training) Information mailing

**Table 2: Application of the Plan Policy Evaluation Method
to Sustainable Development**

Example 1. A policy from the environmental element of the Loudoun County General Plan states that "The county intends to establish an overlay zoning district based on the concept of a 150 foot buffer from…streams that drain 640 acres or more" (1991: 29). The rationale of this policy fosters the working with nature principle by indicating that stream corridors are "excellent buffers for filtering out impurities in surface runoff moving toward a stream, as well as good wildlife corridors" (1991: 29). The type of development management technique used is a zoning overlay. The policy is suggestive and assigned a score of 1 due to the phrase "The county intends…"

Example 2. Another policy from the environmental element of the Loudoun County General Plan states that "The county will continue the Use Value Assessment Program…to preserve prime agricultural uses" (1991: 34).* The rationale for this policy supports the place-based economy principle by indicating that "Prime farmland is the foundation of the County's agricultural industry, one of Loudoun's largest and most valuable economic sectors" (1991: 31). The development management technique used is tax assessment of use value (rather than higher market value). The policy is required and assigned a score of 2 due to the phrase "will continue."

Example 3. A policy included in the housing element of the Charleston Comprehensive Plan indicates that "The City must…create a land bank for future affordable housing developments" (1991: 15).** The plan directly links a goal with this policy, plus includes a supportive rationale. The goal, "Provide City residents with affordable…housing (1991: 13)," promotes the equity principle. The rationale indicates that "Our most critical need is to make housing available for the nearly 9,000 households recognized as very low income" (1991: 13). The development management technique used is a land bank. A score of 2 is assigned to this required policy, as indicated by the phrase "The City must."

Sources:
*   Loudoun County Department of Planning. 1991. Loudoun County General Plan: Choices and Changes. Leesburg, Maryland. Loudoun County Department of Planning.
** Charleston Department of Planning and Urban Development. 1991. Charleston 2000. Charleston, South Carolina. Charleston Department of Planning and Urban Development.

Table 3: Scores of Plans Promoting Sustainable Development Principles by Community

Community	Sustainable Development Principles						Principle Totals
	Polluters Pay	Responsible Regionalism	Working with Nature	Livable Built Environment	Equity/Eradi-cating Poverty	Place-Based Economy	
Sustainable Development Integrated							
Burlington, VT	.0	.0	5.5	3.2	2.3	.0	11.1
Chattanooga, TN	.0	.9	2.1	3.5	3.0	2.1	11.5
Kansas City, MO	.7	.9	2.3	5.1	3.2	1.6	13.8
Lincoln, NE	1.8	1.4	3.5	8.1	1.4	.0	16.1
Livingston, MT	.0	.0	1.2	2.3	.0	.9	4.4
Portland, OR	1.2	6.9	10.4	16.8	8.5	10.8	54.6
San Antonio, TX	.0	.2	2.1	4.8	1.2	1.4	9.7
San Jose, CA	1.4	1.4	3.2	12.0	2.8	1.8	22.6
Seattle, WA	.5	3.0	2.8	6.2	1.8	2.5	16.8
Teton County, WY	.7	.2	3.7	7.1	2.8	.9	15.4
Sustainable Development Not Integrated							
Anchorage, AK	.7	1.4	6.5	6.5	1.6	.7	17.3
Annapolis, MD	.7	.7	2.1	8.5	2.1	2.5	16.6
Arlington, TX	.9	.5	2.8	13.8	2.1	5.5	25.6
Bethel, ME	.0	.0	.7	.9	.0	.0	1.6
Bozeman, MT	.0	.0	.5	7.4	.2	.2	8.3
Bucks County, PA	.5	1.4	8.8	7.4	3.2	3.7	24.9
Champaign, IL	1.2	.9	1.6	9.4	1.2	2.1	16.4
Charleston, SC	2.3	.0	6.7	7.4	5.8	3.0	25.1
Cleveland, OH	.0	.0	.0	4.1	.7	2.3	7.1
Davis, CA	.9	2.1	5.5	13.6	3.9	1.6	27.6
Georgetown, TX	.2	.9	3.2	13.8	1.4	9.2	28.8
Honey Brook, PA	.2	.0	3.0	4.8	.7	.0	8.8
Howard County, MD	.9	4.4	10.1	14.1	4.1	2.1	35.7
Jacksonville, FL	1.2	4.4	14.7	25.3	10.1	7.4	63.1
Loudoun County, VA	.1.8	2.3	8.1	18.7	3.2	3.2	37.3
Madison, WI	.0	.0	.0	7.4	.0	1.6	9.0
Nantucket, MA	.0	.0	3.0	9.9	2.5	.9	16.4
Pittsburgh, PA	.0	.2	.0	5.5	2.5	1.6	9.9
Wilmington, NC	.0	.0	5.1	8.8	.9	3.0	17.7
Windsor, CT	.0	.2	.0	6.7	.9	1.2	9.0

1. Values of .0 are not equal to 0, but are too small to be depicted by 2 significant digits

Table 4: Comparison of Mean and Total Scores of Plan Elements Forwarding Sustainable Development Principles[1]

Plan Element[3]	Sustainable Development Principles[2] Integrated (Not Integrated)											
	Polluters Pay		Responsible Regionalism		Working with Nature		Livable Built Environment		Equity/Eradicating Poverty		Place-Based Economy	
Housing	.0	(.0)	.1	(.0)	.1	(.4)	.6	(.7)	1.4	(1.4)	.1	(.1)
Transportation	.1	(.3)**	.4	(.3)	.3	(.3)	1.0	(1.7)*	.1	(.3)	.1	(.5)**
Environment	.1	(.0)	.0	(.2)*	1.3	(1.4)	.8	(1.8)*	.0	(.1)	.0	(.3)**
Energy	.0	(.0)	.0	(.1)	.5	(.3)	.3	(.4)	.1	(.0)	.3	(.0)
Land Use	.2	(.0)	.3	(.1)	.8	(1.1)	2.5	(3.0)	.4	(.1)*	.5	(.6)
Economic Development	.0	(.0)	.2	(.0)	.1	(.1)	.3	(.5)	.3	(.2)	1.1	(.7)
Public Facilities	.3	(.1)	.4	(.1)	.5	(.6)	1.4	(1.6)	.2	(.2)	.1	(.4)
Principle Totals	.7	(.4)	1.5	(.8)	3.5	(4.1)	6.9	(9.7)	2.6	(2.3)	2.2	(2.5)

1. Values of .0 are not equal to 0, but are too small to be depicted by the significant digits
2. Comparison of mean scores of integrated and not integrated plans for each principle by each plan element and principle totals show t-values that are significantly different for * $p < .1$; and ** $p < .05$.
3. Among the integrated and not integrated groups: F-values are significantly different ($p < .01$) for each plan element, but are not significantly different ($p > .1$) for the energy element; and the F-value is significantly different ($p < .01$) for principle totals.

Table 5: Mean Scores of Highest Principle Versus Remaining Principles

Element: Highest Principle	Mean (standard deviation)		t-test
	Highest Principle	Remaining Principles	
Housing: Equity	1.4 (1.4)	.2 (.2)	4.7**
Transportation: Livable Built Environment	1.4 (1.1)	.3 (.4)	5.4**
Environment: Livable Built Environment	1.5 (1.4)	.4 (.5)	3.9**
Energy: Livable Built Environment	.4 (.8)	.1 (.3)	1.8*
Land Use: Livable Built Environment	2.8 (1.7)	.4 (.3)	7.6**
Economic Development: Place Based-Economy	.8 (1.0)	.2 (.1)	3.7**
Public Facilities: Livable Built Environment	1.6 (1.3)	.3 (.4)	5.0**

 * $p < .05$; ** $p < .001$