CHAPTER 14

Regulating as If Humans Matter

The Transect and Post-Suburban Planning

ANDRÉS DUANY AND DAVID BRAIN

The United States has been experiencing a phenomenon without precedent. While our cities have maintained their fiscal and political reliance on continued economic growth, the very idea of urban growth has acquired strong negative connotations in the popular imagination. Americans have come to fear the growth of their communities, and this fear has become a powerful political force. Citizens who may not take the time to vote for the next president will nevertheless turn out in large numbers to oppose a real estate development. How did it come to be that people who built the constellations of villages, towns, and cities that span the continent should have so radically changed its ethos?

Such fear of growth is not unfounded. Whereas once growth represented an increase in the wealth of the community and the possibility of continuous improvement in the quality of life, there are reasons why citizens might now see it only as an increase in traffic, an influx of social problems, higher taxation, and the loss of open space. Neither is it surprising that there is a lack of faith in regulatory efforts to mitigate such problems. The proliferation of technically complex regulation and the unpredictable results of an elaborate public process have undermined popular trust in the government's ability to act as steward of our common interests and private developers' ability to act as agents of civic improvement.

The common outcome is not only sprawl itself, but a political incapacity to support either systematic alternatives to sprawl or substantively rational planning. Planners often observe that there are only two things about which they can count on finding a consensus in the public process: the criticism of sprawl and the equally passionate rejection of density. In the popular imagination, sprawl is bad but density seems worse; growth is bad but regulations infringe on freedom and yet they are ineffective at preventing bad outcomes anyway. When the negative consequences of development are combined with the breakdown of trust, civility, and respect for democratic process, it becomes difficult for many to imagine a pattern of growth that could be capable of improving both human and nonhuman environments.

Over the last 30 years, this impasse has both fueled and been fueled by the environmental movement. The effects of the environmental movement have been indirect through the shaping of popular attitudes against growth, and direct through the impact of environmental concerns on planning and land use regulation.[1] Although there is no question that there has been measurable improvement in certain environmental indices of conventional real estate development, this campaign has also produced deeply counterproductive outcomes. An unintended consequence of the way environmental concerns have been incorporated into the regulatory regime governing development has been a reinforcement of certain tendencies that produce low-density suburbia.

Environmentalism vs. Urbanism

These unintended effects of the environmental movement are clearly apparent in the tensions that have emerged between environmentalists and New Urbanists in recent years. "New Urbanism" emerged in the 1980s as a response to the broken promises of suburbia and an effort to improve the quality and diversity of the human habitat. Where the environmentalists had focused primarily on protecting nature from further incursions by humans, the New Urbanists focused on the problem of accommodating humans in ways that serve their needs and, incidentally, produce environmentally responsible patterns. Where the environmental response was to attack sprawl but avoid the necessary issues of density and mixed use, the New Urbanist response to the social and environmental damage associated with even closely regulated suburban growth has been to provide the practical and social amenities of pedestrian-oriented, compact, diverse, and transit-ready neighborhood patterns..[2]

Many on both sides find the conflict between environmentalism and urbanism puzzling. How could it be that two sets of values so fundamentally well intentioned—a concern for the natural environment and a concern for building healthier human communities—often find themselves on opposing sides?

There is no reason why environmentalism and urbanism cannot be reconciled and every reason that this reconciliation is necessary. In practice, however, contradictions emerge from both the techniques and the politics of planning.

Some of the tension between environmentalists and urbanists is the result of underlying philosophical differences. The environmental movement, responding to the sense of crisis that shaped its formation, has focused on limiting growth and protecting natural systems from human despoliation. The fundamental orientation of environmentalism is now supported by a scientific understanding of natural ecosystems as the very basis of the continued existence of human life on the planet. In the context of the American environmental movement, however, the science of environmentalism has been tied to a romantic ideal of wilderness that envisions a pristine natural world as if it were not inhabited at all by humans. This vision provides the baseline that runs through the diversity of the environmental movement, from John Muir and the early conservationists of the nineteenth century to the biocentrism and "deep ecology" of today.[3] Although some would say that the core belief of modern environmentalism is reflected in Aldo Leopold's notion that all life is integrated into a single "biotic community," the health of the biotic community is typically measured in terms that do not include the health and literal sustainability of human communities.

William Cronon has argued for the need to rethink the idea of the wilderness as representative of the core values of American environmentalism. He writes: "To the extent that we celebrate wilderness as the measure with which we judge civilization, we reproduce the dualism that sets humanity and nature at opposite poles. We thereby leave ourselves little hope of discovering what an ethical, sustainable, honorable human place in nature might actually look like . . . . By imagining that our true home is in the wilderness, we forgive ourselves the homes we actually inhabit. In its flight from history, in its siren song of escape, in its reproduction of the dangerous dualism that sets human beings outside of nature—in all of these ways, wilderness poses a serious threat to responsible environmentalism at the end of the twentieth century."[4]

Cronon's call to rethink wilderness has been echoed by some scientists, who have recognized the need for a more balanced scientific study of the world's ecosystems, given that human impact is pervasive and that we need to understand the ecological functioning of the human habitat itself, and not just its impacts on a pre-existing nature.[5] The current ecological paradigm privileges a pristine nature and regards the presence of humans as a disturbance in a system that is understood in terms of its condition prior to any human influence. As a result, in practice as well as in theory, a good human community can only be "green" by being invisible—so interspersed into conserved and supplemented nature that it disappears from sight. This is the ideal that has helped to

give credibility to the hyperlandscaped suburban sprawl since Hilton Head, and that is held up as a "best practice" in some circles. Measured against such an ideal, urbanism can only appear as a negative condition, never as an organization of positive choices for the improvement of human communities. Even so, there are grounds for common cause between environmentalists and urbanists. The two movements have common roots in reaction to the destructive impact of conventional suburban development, and there has been a proliferation of alliances between the two movements. Yet many of those who are struggling to build better urban habitats for humans are finding that those who would seem to be their natural allies in the environmentalist camp are turning up at public meetings as opponents to New Urbanist solutions to sprawl. In spite of explicit efforts among national environmental organizations such as the Sierra Club to mobilize anti-sprawl initiatives, urban projects that recognize the link between urbanity and land conservation often run up against environmental opposition at the local and regional level.

This contradiction is partly the result of the way the environmental movement produced a "quiet revolution in land use regulation" focused on open space and the definition of where not to build.[6] This logic has guided the integration of environmentalism into a technical and regulatory system that tends inadvertently to enforce suburbanization. We can see evidence of this in the requirements for "greening" urbanism in the form of maximum lot coverages, ubiquitous landscaping, and on-site stormwater detention requirements.[7]

Even those who have argued for "sustainable development" have had to struggle against a persistent suspicion that sustainability can be a kind of "green wash" for the growth orientation that got us into trouble in the first place. Indeed this accusation is often warranted. It is easy for the practical application of the ideal of "sustainable development" to remain superficial when the primary measures of environmental performance imply simply increasing the naturalistic quotient of conventional projects. Consider flagship projects based on this measure: Hilton Head in South Carolina or the Woodlands in Texas. What resulted from these reforms was a greener, more attractive suburban sprawl. Sensitive environmental land was preserved and the rest was given over to low-density, highly landscaped single-use zones, connected by well-buffered arterials. As conventional subdivisions and strip shopping centers are hidden behind berms, the economic segregation of suburbia is exacerbated, and it is impossible to walk to any useful destination. The outcome of this environmental model is that the better parts of nature are preserved while traffic-generating and socially dysfunctional development is camouflaged with a naturalistic aesthetic.

Techniques for measuring the "ecological footprint" of human settlement have inadvertently supported a misanthropic attitude.[8] Cities are assessed in terms of quantitative measures of their brute consumption of raw materials and energy and as producers of waste, heat, and even light.[9] By such measures, the environmental performance of the great cities of the world (London, New York, etc.) looks dismal, whereas the best measurements seem to be found in low-density suburbs. Although there is political value in quantifying the impact of human settlement in this way, there are fundamental theoretical and methodological problems inherent in drawing generalizations from data aggregated without attention to the functional differences between urban contexts. Assessments are taken from the outside, with complete indifference to the inner workings of the city as human habitat.[10] The city appears as a black box, into which resources flow and from which waste emerges. By such measures, the austerities of widespread poverty might lead to the best performance. It is assumed that the city's impact is to be accounted in terms of a cost imposed on nature, rather than regarding the city and the natural region as part of a common history in which resources are generated as well as exploited.[11] One cannot make sensible assessments of an optimal "energy budget" unless there is an understanding of the human values for which one is budgeting and an analysis of the form and qualities of the human places that are to be sustained by the budget.

A regulatory apparatus that is focused on the protection of nature rather than on a positive vision of human places reinforces a tendency toward a politics of obstruction. When Paul Murrain spoke at the Ninth Congress for the New Urbanism (New York, 2001), he created a furor by pointing out contradictions that have emerged between environmentalism and urbanism. He was careful to preface his comments by noting that he sees no contradiction between defending things "natural" and being passionate about urban places, commenting that he believes "contiguous, sizeable urban tracts are as vital to the sustainable agenda as pristine ones are to environmentalists." According to Murrain: "However, far too often many environmentalists measure their success as stopping things from happening. Often it makes no difference whether it is sprawl or urbanism. If they green, fracture, or de-densify the urbanism, that is 'making something better.'"[12]

High-density urbanism is regarded in terms of its negative impact on nature, quantified as an "ecological footprint" that is always too large to be defensible. Clearly it makes sense to argue that "sustainable communities should be conscious of their resource needs and waste streams, ensure that they do not destroy and exhaust the bioregion in which they are situated, and seek to minimize the environmental pressures placed on other regions and countries."[13] However, an emphasis on the design of cities in terms of resource flows and waste streams has to be balanced by an adequate theory of urbanism in its own terms, representing the functionality of the human habitat to be sustained and not just the natural ecosystems it can only be seen as destroying.[14]

The Results of Specialization

The consequences of this environmental perspective are amplified by the way it has been ingrained in the protocols of specialized experts who are trained to focus only on their particular piece of the process. Those concerned with natural systems are insistent that the concerns they represent be given priority, and those who focus on road construction, say, or urban design, do the same for theirs—with no way to resolve contradictions. The adjudication of conflicts involves disaggregating the elements of concern so that they can be handled in isolation by each specialist. The components are treated as abstract problems defined within each discipline, rather than as the interconnected task of creating places that meet social, economic, and ecological objectives precisely because they are put together in a certain way. Environmentalism in professional planning has not yet evolved the technical capacity to assess authentic urbanism, nor to articulate the tradeoffs between conservation and intense development in terms that allow for the reliable and effective (not to mention efficient) political resolution of conflicts.

Many problems derive from the fixations of different kinds of environmental specialists. For example, in Hillsborough County, Florida, the regulated minimum size of a tree planter is 120 square feet. That means that you need about 10 feet by 12 feet in order to plant a street tree—even in a downtown. The specialist is biologically correct: a tree in Florida does indeed need 120 square feet of unpaved surface to truly flourish—but that is considering only the tree, not any of the other aspects of designing a street, where the tree must participate in concert with building, sidewalk, and curb toward the creation of a pedestrian-oriented public place. The technical specification is based on the expert's knowledge of contented trees. In urban settings, however, trees have always been asked to compromise, to live in planters that are 4 foot square and even smaller. In a regulatory regime where the specialists each contribute in isolation, it is the community as a whole that is always compromised.[15] The cumulative effect of meeting standards defined separately for each component leads to decidedly suboptimal outcomes, but there is no technical framework within which to make precise and defensible assessments of the cumulative effects of allowing particular compromises between the requirements of nature and the needs of humans.

Downtowns in southwest Florida have great locational and cultural assets, and are ripe for redevelopment. It is initially a puzzle as to why renovation or infill is slow to happen. As it turns out, one of the primary obstacles is the requirement that to renovate a building or redevelop a lot, the developer is required to manage the storm water entirely on the property. There may be perfectly good drainage in the street on which the property sits, but the requirement is to detain the rainwater on-site.

The authors of such rules may have been imagining a pond where the water can be allowed to infiltrate slowly into the aquifer, or simply held so that added impervious surface doesn't flood the adjacent properties. This is a perfectly reasonable standard for a greenfield site, but it makes redevelopment and infill difficult, especially as whatever space is available on a small lot is required to meet parking requirements as well. As a result, the only places that redevelop naturally in southwest Florida are places so valuable that it is feasible to agglomerate land sufficient to build structured parking or a cistern (see Figure 14.1). In downtown Fort Myers, for example, a developer was prepared to build a mixed-use town center on the site of a completely paved, dead shopping center—a classic infill project of the type that mitigates sprawl. The local environmentalists were in favor of it, but the regulations at the Southwest Florida Water Management District allowed for no flexibility in adjusting the regulations to respond to the specific conditions. In cases where there is controversy, there is likely to be even less flexibility, as the opponents press for enforcement to the precise letter of the law.

There is a certain logic to this regulatory system. The idea is to manage the environmental consequences of development by making each site take

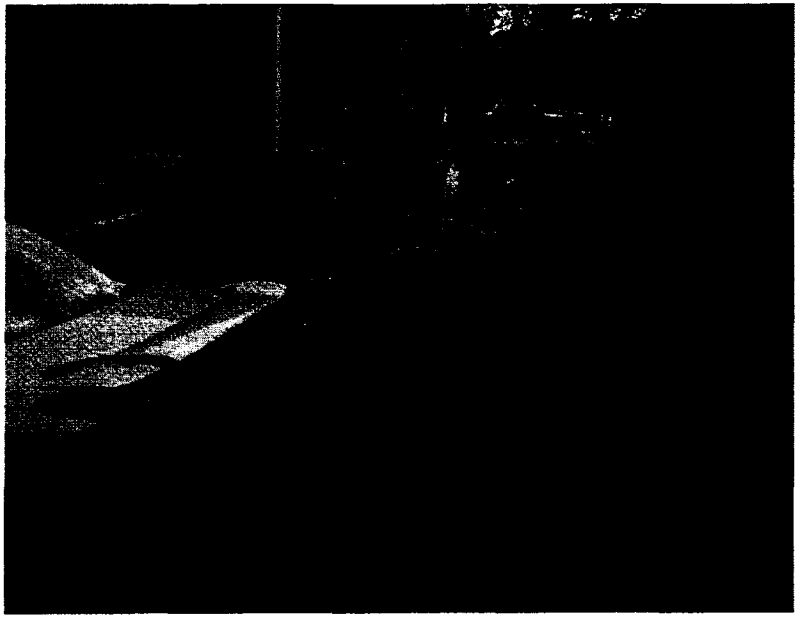

Figure 14.1 A stormwater retention pond in an urban condition of southwest Florida. (Source: Duany Plater-Zyberk, DPZ)

responsibility for its share of the overall impact of growth. The advantage of internalizing environmental solutions within each project is that the public burden is reduced, at least in the short run. The indicators of ecological performance tend to be defined as discrete measures for purposes of clarity and fairness, and the expectation that projects be subject to the same regulations means that the application of standards has to ignore significant differences of urban context. This situation has three unfortunate consequences: developers are driven away from infill settings to greenfield sites, where it is easier and more cost-effective to meet such standards; redevelopment is only possible if the market supports relatively up-market and high-profit projects, limiting economic diversity in the outcomes; and designers are pushed to naturalistic solutions that tend to disrupt the functionality and character of pedestrian-oriented urbanism.

Some problems are exacerbated when the idea of "greening" the city is simply being taken too literally. At a meeting of the Congress for the New Urbanism in Portland (1997), for example, one of the local members announced, "We (in Portland) will not stop, until there is a forest in every square and a stream beside every street." One might accept this simply as rhetorical overstatement, but it also can be seen as a symptom of an attitude toward nature that regards social space as blight, to be mitigated by plant material and naturalistic water features. There are good arguments for greening, but it cannot be a matter of imposing blanket rules; the goal cannot be simply to squeeze in as much nature as possible.

Other examples result from absolutism in efforts to provide protection for wetlands, greenways, and wildlife corridors. Again, it isn't that such protections are unnecessary or unimportant. However, a regulatory approach that gives ultimate privilege only to natural features, with no adjustment to the specifics of context, tends to favor conventional suburban development patterns at the expense of either the urban or the rural character of places. Developers often find themselves constrained to preserve isolated wetlands that can retain no real ecological value, while being completely free (or even compelled by the fact that it is all they have left) to destroy wooded upland that might be significant for human recreational use. A demand for intact greenways often disrupts connectivity of urban street networks, thus favoring the "dendritic" street system characteristic of conventional suburbia. As a result, the creatures may have easier access to their food sources or their mates, but the humans end up spending their time polluting the atmosphere on gridlocked arterials.

Why Keep Environmentalism Outside the City?

One of the more recent campaigns of the environmental movement has been its concern for the conservation of open space of any type, not just of ecologically

sensitive areas. This has become a fixation on the idea of an "urban growth boundary" as the predominant strategy for the regional scale of planning. One symptom has been the uncritical apotheosis of Portland. The problem is not that putting geographic controls on the outward expansion of urbanized areas is a bad idea, but that this technique is regarded by many as "solving sprawl," with a consequent lack of attention to the importance of the community pattern with the boundary.

As an actual presence on the land, the Portland urban boundary is a negligible physical artifact. The principal difference it creates is that outside the boundary the farmer is a farmer, whereas inside the farmer has become wealthy by selling or subdividing. The value differential is so extreme that the line is inherently unstable, and so the boundary surreptitiously or overtly moves—and will continue to do so. In a capitalist system, there is too much at stake economically to establish a defensible line when there is no environmental determinant on the ground. But that is not the most immediate problem.

The real problem is apparent in the area between the excellent historic neighborhoods and the boundary—most everything that has been newly developed is identical to sprawl anywhere else: strip shopping centers, unwalkable arterials, and automobile-dependent residential subdivisions. As a result, it is not only of regrettably low quality, but it suffers from the chronic inability of suburban patterns to accommodate increasing density, adding a final determinant to the inherent instability of the growth boundary.[16]

The urban growth boundary, which was heralded as a great victory for the environment, was also a tremendous boon to developers. Elsewhere environmentalist groups contest every project, often forcing developers to do a better job. In Portland, the developers were essentially given free range within the urban boundary, effectively neutralizing the possible impact of reform-minded groups on the character of development that was taking place inside.[17] The environmental impact of growth depends on the specific urban pattern within the boundaries of growth, but environmental groups were not equipped to assess this, so it slipped their attention until too late for much of the area within the boundary (see Figure 14.2).

At its core, the underlying principle of the urban growth boundary is essentially a defensive strategy. It is similar in logic, although at a regional scale, to the idea of "clustering." The best we can hope for, it would seem, is to contain humans within geographic limits that keep them from unduly encroaching on nature. The need to do a better job with the land that is to be developed as human habitat has not been of direct environmental concern. This approach reduces the effectiveness of an environmental proposition precisely to the extent that it focuses only on the limits of growth. If *the environment* is defined as the landscape devoid of human action, then we have given up on the ability to

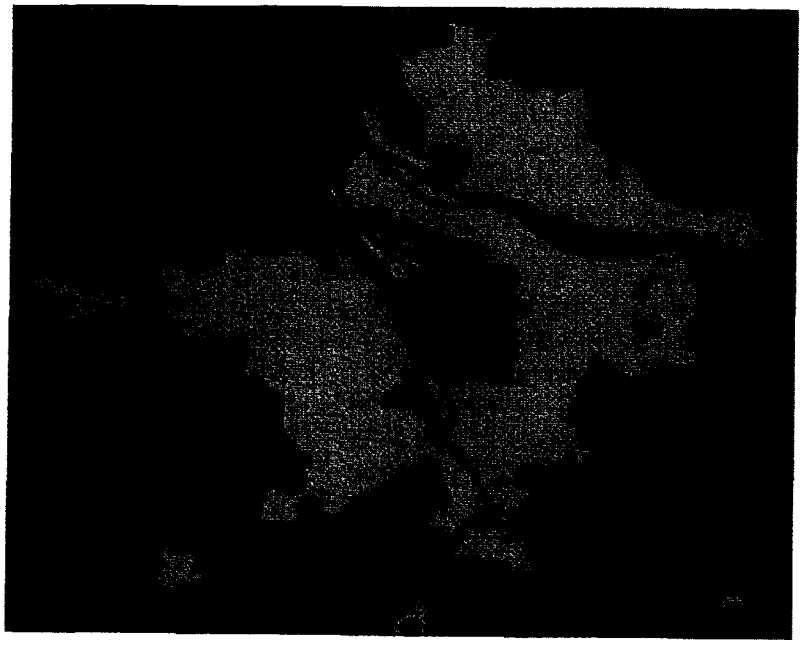

Figure 14.2 The urban growth boundary in Portland, Oregon. The dark areas are those parts of Portland characterized by walkable urbanism. The light area indicates the amount of land that has been left to conventional suburban development within the growth boundary. (Source: DPZ)

manage nuances of the interaction between the social and natural aspects of the world.

We can see a similar limitation in some recently evolved manifestations of the Smart Growth movement, although it has been allied with New Urbanism from its very beginnings. The Smart Growthers tend to concentrate on policy at the regional scale, largely oriented toward the maintenance of congruent urban growth areas. From the scale of the region, Smart Growth advocates tend to skip down in their attention to the level of "green building standards." These are valid practices in themselves, but no less so than the issues of community design—that middle scale that links architecture with regional issues. Smart Growth explicitly recognizes the community scale in principle, but there has been less than adequate political emphasis on the provision of the social diversity, mixed use, and walkability. The unintended consequence of this uneven commitment is that often no distinctions are made in practice between New Urbanist development and conventional suburban development, so long as the project is within the designated growth areas. Lack of rigor at the scale of urban

design has allowed NIMBYism, under the banner of Smart Growth, to attack good New Urbanist greenfield development as sprawl.[18]

In Sarasota County, for example, the local chapter of the Sierra Club and local environmental interests recently sided with no-growth organizations in opposing a new comprehensive plan that was intended to discourage the existing pattern of low-density sprawl, encourage compact mixed-use villages and sustain the diversity of landscapes. The opposition focused on the fact that the new plan would simply allow more development beyond the current urban services boundary, although it is plainly evident that the line drawn on the map has little relationship to what appears on the ground. There has been a consistent leakage of large-lot subdivisions and other development outside the boundary. Many of the local environmentalists explicitly preferred that the county be built out with an even spread of 5-acre "ranchettes" (according to current zoning) rather than by clustering development into villages and requiring developers to make planned allotments of land to connected systems of open space. The aim of the opposition was simply to allow as few people as possible to settle beyond the mythical urban boundary, ignoring the persistence of the socially as well as ecologically problematic form of purely residential, exclusively upscale automobile-dependent subdivisions.

Although many environmentalists prefer to think of themselves as embattled outsiders struggling against the establishment, the fact is that environmentalism has been thoroughly institutionalized into the rigid bureaucratic process against which New Urbanists often find themselves struggling. The problem is not only with specialized environmental regulation, but with the way specialized expertise has become interlocked in both government and the market such that it cannot be overcome by tackling simply one locus of the problem. Stefanos Polyzoides has described this as "operating on autopilot," an image that captures the reality of a system that builds places in ways dictated more by prior programming than by humane or rational response to immediate conditions.

One of the most striking things about this system is the extent to which its components contribute to self-reinforcing patterns of sprawl. Even when it is possible to arrive at a consensus regarding the general desire for patterns other than conventional suburbia, there is resistance from the system itself. Advocates for a project may succeed at convincing the individuals involved—the fire marshal, the transportation department engineer, the planning commissioners, and others—of the reasonableness or desirability of a proposal, only to run up against impersonal standards or routines in another part of the system. The local fire marshal might come to agree as to the desirability of a proposed variation from conventional practice, for example, but the insurance companies or the mortgage lenders might then present obstacles for the proposal. What makes current protocols so difficult to countermand or adjust is

that they have over the years concatenated into a comprehensive and tightly interlocking system with its own internal rationality. This is one of the reasons why, as Chris Leinberger has shown, there are only 19 types of real estate product in the market. The pervasive protocols reinforce the sprawl pattern that is easily recognizable by the system.[19]

Central to this system is conventional zoning, which has certain features that make it conceptually elegant and efficient to administer. By separating everything into defined categories based on use, it becomes easy to control and assess outcomes using precise quantitative measures. Traffic is one particularly important area where measurement is facilitated by conventional zoning. The traffic engineers can, with apparent precision, predict that a particular type of project will generate a certain number of car trips per day. Their job is facilitated by the zoning categories as well as their own design standards. When the separation of land into single-use zones is coupled with a system of thoroughfares based on a dendritic pattern (cul-de-sac, local, collector, arterial, highway), it becomes easy to construct models that predict "level of service" for traffic. The ability to interrupt the street network also happens to support the effort to maintain the connectivity of the environmental systems (greenways, wetlands, etc.).[20] In the new town of Abacoa, for example, the traffic network was originally designed to have three routes through each neighborhood, so that no street would be overloaded and all would be pedestrian friendly. The integrity of the greenways,[21] however, required the elimination of what were regarded as redundant connections, reducing the number from three to one for each neighborhood, and thereby undermining the quality of public space human permeability. The assumption among the specialists is that the "green" considerations—the functionality of the animal habitats—trump the social requisites of human habitats, even on land exceptionally well located to be urbanized.

Over time there has been a translation of parking requirements into building types (such as walk-up apartments, townhouses, etc.) that correspond to zoning categories. These also correspond to recognized market segments. Such standardization is the reason why there are so few building types with normative standing in current development practice. The demands created by the car, and supported by the categories of zoning code, create a repertoire of routine building products that are market tested and so recognized by the loan officers who provide the financing. The incentives for sticking to the standard products are increased by the extent to which loan officers are likely to resell the loan in the secondary financial market—the Real Estate Investment Trusts (REITs) and pension funds with billions per year to invest in such mortgages. Efficient decisions are a requisite of massive investment protocols and so they must be guided by checklists controlling the acceptable attributes of the property, and these, of course, happen to correspond to building types that correspond to zoning and ultimately to parking. Adherence to standard products minimizes transaction costs and reduces procedural friction as one moves through the development process.

Many of the problems emerge because the system focuses attention on discrete measures, but lacks the capacity for adjustment based on the interactions of the measured conditions as they are assembled into whole places. There is no capacity for the kind of responsiveness to context that is necessary when designing and planning for the complexity of human communities, especially as they change over the course of their history. The current system is compelling from the standpoint of institutions operating on the supply side of land and capital, and from the standpoint of bureaucratic administration, but not because it is an optimal way in which urban elements might be organized in order to produce beneficial social and ecological outcomes. That is surely evident from observing the last decades of development under this system.

A Reconciliation of Environmentalism and Urbanism

Although there is in principle no reason for a conflict between environmental concerns and a commitment to urbanism, there are significant conflicts in practice as a result of the way discrete issues are coordinated within the regulatory regime and within the conventional practices that have hardened into the professional division of labor. There is a conflict between the quantitative measures associated with a system of specialized expertise and the challenge of creating suitably complex places to meet the changing needs of society and economy. Finally, there is a conflict between politics that encourages simplistic tactics and the nuanced understanding necessary to enable a declension of compact, diverse, walkable communities.

The environmental movement has carved out a stronghold on the moral high ground. Within American culture, dominated as it is by individualism, it is very difficult to give legal and political standing to substantive notions of the public interest or the common good. Nonetheless, environmentalism has succeeded in establishing concern for the natural environment as a definition of the public interest that can even—at least in certain cases—override concern for the rights of private property. This is not to say that such invocations of the public interest are always uncontested or that they don't sometimes fail, but the achievement is really quite extraordinary.

Second, the environmental movement has been successful in having environmental requisites written into state and federal law, and into the local regulatory regimes that are the most immediate context of land use decisions. If one can find at least one "listed" species[22] on any specific parcel of land, one has immediate legal means to cause even powerful economic interests to make substantial concessions. On what other grounds is it possible to stop a highway, for

example—long an unquestioned symbol of progress? Whole communities of humans have been pushed aside for highway construction, but certain fish and fowl have caused even the most single-minded transportation department officials to reconsider their designs.

This regulatory regime has given rise to specialized professionals charged with representing the interests of nature. Their authority is technocratic, their language precise and standardized, their operations dependent on specific statistical measures of performance that tend to single out ecological conditions understood to be indicative of the acceptable limits of human interference. This expertise has standing equal to any of the others in the division of labor among specialists—traffic engineers, market analysts, zoning administrators. All are given mutually recognized prerogatives in the regulatory process by their ability to represent their concerns in technical and quantitative terms.

Finally, along with the advantages of growing moral authority and the legitimacy provided by claims to scientific expertise, the environmental movement has not forgotten its tradition of morally energized activism, now institutionalized in a great number of organizations. Some of these organizations assign their impressive resources to the expression of the pervasive fear of growth, becoming ready allies for any local interests motivated to oppose projects for any reason.

The powerful combination of a capacity to mobilize collective action with the moral leverage of claims to represent a legitimate public interest, and a regulatory regime that gives its concerns legal standing, enables (and even makes routine) effective protest, tends to discourage the kind of intricate and informed discourse necessary to produce real solutions to complex problems. Although the intervention of environmental activists can and do result in making some projects better, their power to cause friction is much greater than their capacity for encouraging creative solutions, thus tending to delay, dilute, or simply stop development from happening—good or bad.

In cases where environmental regulation has been an obstruction to good work, the defensive response is "But that's not environmentalism! Those are not-in-my-backyard (NIMBY) reactionaries, masquerading as environmentalists." That may be so, but the point is that the environmental movement has succeeded in having its concerns institutionalized as a significant part of the system that helps to perpetuate sprawl. Good intentions have been translated into a procedural regime—with its particular politics—that too often causes activists to undermine even their own stated goals.

Clearly environmental concerns are critically important as a component of the way we plan and design human settlements. However, the tendency has been to focus too exclusively on the protection of what is understood to be nature and not to give sufficient attention to the relationship of human economy, values, and choices to the opportunities afforded by natural systems.

Recent environmental thinking has made great progress in correcting this imbalance. For example, William Shutkin has also pointed out that traditional environmentalism has been narrowly concerned with a romantic ideal of protecting the wilderness and has relied too much on legal and policy tools that "disparage economic growth without proposing legitimate alternatives, thus decoupling economic challenges from environmental problem solving."[23] Shutkin offers one among several recent articulations of the idea of "civic environmentalism."[24] According to Shutkin: "Civic environmentalism confronts the irony that most Americans seem to care more about protecting remote natural areas than the very places they inhabit, and posits the notion that we would have to spend less time worrying about protecting remote areas if we ensured that the places where people actually live are environmentally and socially healthy."[25]

Although this kind of thinking is finding growing currency, and has affected practice in some exemplary cases, for the most part it has yet to penetrate the front lines where environmental ideas are rendered operational: the way environmental protection is written into regulation or the ways environmental science is used to inform the political process. Counteracting sprawl is possible only if one has a clearly articulated and technically elaborated proposition concerning the alternative. Environmentalism needs a theory of urban form as much as New Urbanists need a theory that enables them to understand the ecological impact of urban development.

The challenge is to forge a technical reconciliation between environmentalism and urbanism that is simultaneously responsive to political requirements. There is an urgent need for a technical framework that strikes a better balance between the protection of natural ecosystems and matters of urban design concerned with meeting human needs and realizing human values. This framework must be capable of operating effectively in the context of a modern legal and regulatory system, and also simple enough to allow a productive role for citizens to participate.

The key to a solution is to dissolve the tendency to see economy and culture as outside nature, and to let the needs of humans back into environmental discourse and practice. Humans must have standing in a system encompassing choices that reflect both urban and natural values. Among significant human needs, we should include a need for diverse types of communities capable of accommodating a range of individual lifestyle choices, some that are intensely urban and others that are progressively more rural. The framework must specify with technical precision the varied integration of appropriate natural elements into human settlements of different types and at different scales, and the way these settlements should integrate into varied natural settings as part of regional systems.

New Urbanists have been struggling for years to create patches and workarounds that allow urbanism to interface with the operating system that was designed to support conventional suburban patterns of development. In the early phases of the New Urbanist movement, practitioners tried to address the obstacles piecemeal, responding to the objections of the zoning administrator, traffic engineer, loan officer, environmentalist, marketing expert, and so on, as they came up. But this has been found to be far too time consuming, given the rate of growth in the United States, and it requires well-intended and extraordinarily patient developers who are more willing to weather greater difficulty than those building sprawl. It is now necessary to move from the mentality of designing interfaces (that are always less than optimal) to the design of an alternative operating system, one that is as comprehensive and as elegant as the one it is intended to replace, simple in the ways that it needs to be yet capable of generating the complexity required by human communities. In order to complement the asymmetry of the environmental perspective, a theory is necessary that encompasses both the social and natural variables, balancing them to achieve quality human habitats as an integral tool in the pursuit of sustainable environmental outcomes. This theory can be based on the urban–rural transect.

The Urban–Rural Transect

A transect is simply a kind of cross-section, a line traced across geography. In ecology and environmental science, it is a sampling technique. One draws a line along some observable gradient—wetland to upland, valley floor to mountain top—and then takes samples at intervals, systematically analyzing the characteristics of the minerals, plant communities, and animal habitats along the way, including soils, flora, fauna, humidity, and microclimate (see Figure 14.3). It is a technique that allows the scientist to make sense of the elements and patterns that make each habitat distinguishable and also to understand their succession as part of a larger system.

Michael Barbour has described the "holistic" ideas of Frederic Edward Clements, a principal proponent of this kind of ecological thinking in the United States, beginning in the 1920s: "Clements had argued that natural vegetation tended over time to become organized into discrete units separated by narrow or broad ecotones. These units, which he named formations or associations (and which others have come to call communities), are uniform over large areas."[26]

An analysis that *moves* along a transect between taxonomically distinguished communities provides an opportunity to capture both the associational attributes of those elements that make a single habitat or community identifiable and the relative intensity of distribution of certain elements across

Figure 14.3 The natural transect. A transect is a line that cuts through a sequence of distinct habitats arrayed along some kind of gradient, for example, wet to dry or lower to higher ground. (Source: DPZ)

a gradient. The idea of a transect that includes the full range of environments shaped by human intervention, as a way to make sense of the relation between social and natural systems, has a lineage back to Patrick Geddes, with his 1910 illustration of the valley section[27] (Figure 14.4). One can identify the transect (or what Emily Talen has called a "transect sensibility") in a wide range of sources. It is essentially an understanding of context and a sense that not everything can be put anywhere and still function appropriately. There is an understanding that the allocation of elements and attributes corresponds to the distinctive character of different kinds of places, from the most natural and least affected by human intervention to the most cultural and most intentional — reflecting a range of human needs and desires, a range of social patterns, and a range of ways in which humans and nature interact. Once sensitized to this idea of an urban–rural transect, one begins to perceive it everywhere and recognize its logic in the cultural coding of nearly every kind of artifact, from clothing to cuisine, from music to buildings.[28]

John Nolen and Raymond Unwin's books show that early-twentieth-century planners depended on their orientation as generalists, their attention to the way all the specialized elements of design could coalesce to produce coherent habitats that would be quite different in degrees of relative intensity. As Emily Talen has shown in her examination of the texts of the American planning and engineering professions, this sensibility seems to have disappeared by the 1960s. As the bureaucratic setting of municipal administration began to focus more and more on quantitative measures, legal and procedural correctness, and the building up of bodies of expertise in specialized areas, development increasingly became a collection of functions to be considered in their own terms, in the isolation enabled by the specialists' skill at abstraction and technical precision.

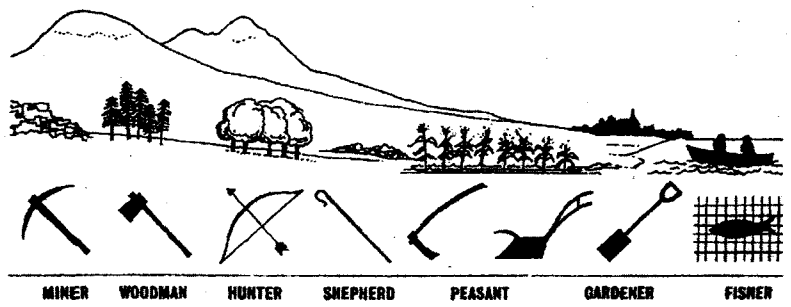

Figure 14.4 The valley section. In his 1910 conceptualization, Patrick Geddes combined a natural transect with a corresponding transect of human activities. In the context of contemporary environmentalism, one immediately notices that this transect has been constructed from the standpoint of the human exploitation of natural resources. (Source: DPZ)

Conventional zoning—the current operating system—is primarily about distribution of functions. Originally guided according to a principle of avoidance of noxious adjacencies, it has become an instrument of statistical control, acceptable because its simplifications create some predictability in the development process, not because it produces livable neighborhoods or beautiful towns. In contrast, an approach to urban form guided by the continuum of the urban–rural transect would focus attention on the complexity of different kinds of habitats, each of which responds to human needs both because of its distinctiveness and because of its place in a larger system of differences.[29]

The transect's extension of ecological theory to urbanism recognizes that there is a similar need to understand the character of distinctive communities sustained as part of a regional system (see Figure 14.5). On the one hand, there is the view that much of what happens in cities is the result of elements that distribute themselves in space according to some specific logic (e.g., the logic of the markets for land, labor, and capital or perhaps the logic of intergroup competition).[30] On the other hand, a transect-oriented perspective emphasizes that the various components of the built environment—building types, frontage, street sections, landscaping, and so on—interact to produce types of places,

each of which can be seen as evolving toward a kind of "climax" condition. The analogy to plant communities is not exact, of course. Obviously the components of urban form are not adapting through their own efforts or reproductive processes like a plant or animal species, but adapted by humans (often shaping as well as reacting to surrounding conditions). However, the survival of certain urban and building typologies depends on the emergent properties of their association, and the coherence of these associations and the related differentiation of typologically distinct places is important for maintaining the diversity of human habitats. Two examples of this kind of association are the association of the density of the transportation grid with sustaining retail of a certain size, and the importance of on-street parking for pedestrian-oriented building frontage.

The Social Gradient of Places

The desirability of maintaining a diversity of human habitats along an urban–rural transect has been supported by a variety of research findings. Although his typological declension was not originally intended to be regarded as an elaboration of a transect theory, Sidney Brower's study of residential neighborhoods provides a good example of the connections between social values and choices in physical design.[31] Brower set out to address what might seem to be a few simple questions: how do people choose residential areas when they have a choice? What qualities do people value? By examining the various dimensions of such choices, he was able to create a typology of residential communities that is based "in residential life-style rather than geographic location."[32] It is a typology that is not only descriptive, but captures the normative character of different kinds of places that manifest a particular experience of social order.

The typology focuses on three qualities, culled from 33 characteristics found in a range of satisfaction surveys, each having to do with ways that lifestyle and place are linked: ambience, engagement, and choicefulness. The first has most directly to do with physical qualities: the mix and pattern of land use, the "look and feel." The second has to do with "the way that residents engage and avoid engagement with one another and the extent to which they are facilitated or obstructed in this by the physical and social features" (pp. xii–xiii). The last one has to do with the extent to which individuals are able to choose "where, how, and with whom they will live and the range of different types of living environments from which they may choose."[33] For example, it turns out that choicefulness is manifested in the sense that a particular place might represent a choice that one could willingly make and justify (whether or not one actually had a choice and whether or not this was actually the basis on which choices were made).

Figure 14.5 The urban–rural transect. This drawing illustrates (and presents an analytic characterization) of typical conditions along a transect from the most rural to the most urban context. Where Geddes's transect focused attention on functional relationships between the natural environment and human activity, the contemporary urban–rural transect is understood in terms of settlement patterns and built form, and the different ways they integrate with nonhuman nature as one moves from the most rural to the most urban condition. This illustration is intended to be typical rather than rigidly normative. A North American transect looks different than a Latin American or Asian transect. Its real power is realized when it is locally calibrated based on detailed empirical analysis. For the purposes of both conceptual understanding and coding, the continuum captured by the transect needs to be sliced into discrete categories. (Source: DPZ)

Brower identified four types of neighborhoods that emerge from a synthesis of empirical findings: *center, small town, residential partnership,* and *retreat.* A center community is bustling, varied, and changing, inhabited by diverse kinds of people and characterized by active public spaces that connect uses rather than separate them. It provides choices among many competing facilities and includes notable monuments and institutions. A small town community is less open and cosmopolitan than a center, has a strong sense of continuity and more parochial institutions and public places that cater to locals, but is still a vital public realm that provides connections between residents and welcomes strangers. A residential partnership is typically a bedroom community, associated with a single set of tastes or lifestyle, providing some shared amenities catering exclusively to residents, and a "cocoon of tranquility around the housing units of its members." A retreat emphasizes privacy and has no connecting facilities or shared amenities. It allows no outsiders and expects no connections between neighbors.

This typology implies not only physical variation, but variations in qualities (such as expectations regarding the intimacy or frequency of neighborly engagement) relevant to the social character and experience of place. Many of the normative implications can be understood in terms of the way we organize relations along a gradient from the personal and intimate to the communal and parochial and, finally, to the impersonal and public. The key dimension of variation has to do with the balance in intensity between private and public space, with the more urban neighborhoods being characterized by connection to a more diverse and vital public realm. Brower found what might be a surprising distribution of preferences for different kinds of communities. Twenty-seven percent of Brower's sample stated a preference for the small town type. Only 22 percent stated a preference for a residential partnership, and 3 percent preferred to live in a retreat.

Brower's work points indirectly to the failures of conventional market research to identify the full range of American housing preferences. Conventional studies usually indicate a preference for the single-family enclaves of suburbia. A more complicated understanding of housing preferences, more in line with Brower's analysis, is supported by other analyses, such as studies using Zimmerman and Volk's "target market" methodology.[34] Brower clearly shows the functioning of the transect in the way people think about communities, indicating both preferences and needs associated with a diversity of places, each of which depends on its internal characteristics and its geographical position relative to other places for its desirable qualities. A key dimension of the differences is the extent to which a neighborhood offers engagement with a social context (e.g., urbanism with its value in emphasis on the public realm as opposed to solitude and engagement with a more natural environment).

Volk and Zimmerman observed that the apparent uniformity of housing preferences revealed in conventional surveys is contradicted by the willingness of buyers to bid up the value of housing in transect-based developments when the option is there.[35] They linked this confusion "to both the undifferentiated environments in which most Americans find themselves living, and, correspondingly, an inability on the part of surveyors and researchers to differentiate clearly the complexities of housing preferences."[36] In contrast with the usual supply–demand analysis, their methodology uses a mix of demographic and economic data, along with credit-card-based consumer preferences, to distinguish types of households, associate them with lifestyle preferences, and to determine the depth and breadth of the market for housing options arrayed along the transect. One of their most striking findings is that there are definite patterns of movement along the transect by households as they change in age, composition, or economic status. They also predict that as the baby boomers age, they are much more likely to prefer the kind of diverse communities characteristic of more traditional urbanism over the automobile dependence of the suburbs or the functional specificity of age-qualified subdivisions. Where Brower's study suggested a robust need for neighborhoods and communities that vary in the intensity of their urbanity, Volk and Zimmerman suggested that many of the failures of the market to deliver a satisfying range of residential choices can be traced to the failure to understand that statistically similar housing programs are differentiated by their location along the transect. For example, a two-bedroom, two-bath unit is an utterly different lifestyle option when it is a cottage in a suburban transect zone and a loft in an urban center. Both Brower and Volk and Zimmerman noted that people commonly choose different kinds of communities at different stages in their lives, and Volk and Zimmerman suggested that movement along the transect in favor of increased urbanity will increase steadily with the aging of the baby boomers.

Understanding Places Using Transect Zones

As a basis for understanding places and building a regulatory system, the transect provides a common operating system for all specialized regulatory standards. Land use, building types, thoroughfare streetscape standards, signage guidelines, and environmental standards can all refer to the common platform. All those who are specialists can coordinate their work virtually without even knowing of each other's efforts. Each of the professions can begin to rewrite their standards (as the Institute of Traffic Engineers is doing now, describing the effort as being "context sensitive"). For purposes of clarity and ease of administration, the proposed diagram (see Figure 14.6) represents the gradient of the transect in terms of six zones, from wilderness to urban core.

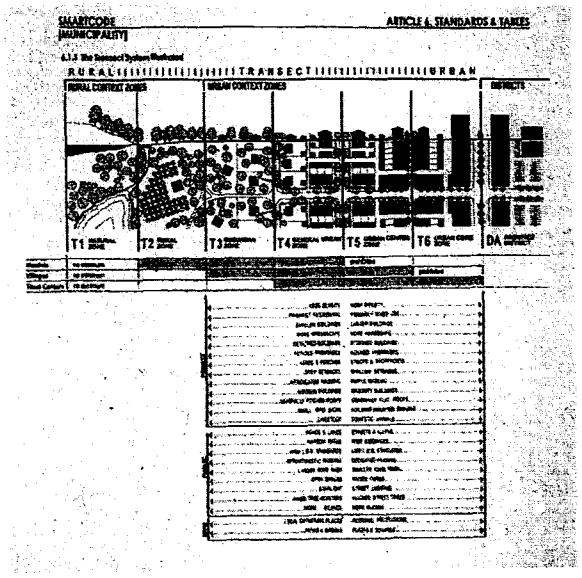

Figure 14.6 Using the transect to assemble different kinds of places. In addition to identifying characteristics of each context zone, a transect-based code would specify the appropriate mix of context zones for different types of human settlement, from hamlets to town centers. The key principle is that each community type involves assembling at least three context zones, each of which is both distinct form the others but also benefits from its connections to them.

The six T(ransect) zones are the unapologetically artificial calibration of a continuum in order to create a clear and cognitively manageable set of definitions, akin to the current planning standard of normative "zones" albeit each managing a desired complexity rather than an intended monoculture. The motivation for standardizing six zones is not only that it has worked well in empirical application in many analytical and design projects,[37] but that this number of variables approaches the threshold that most lay participants in the public process are able to handle without too much confusion.

The first zone, designated *Natural* (T1), is the most pristine natural condition, areas closest to the wilderness ideal and in which human intervention is oriented toward ecological stewardship rather than to accommodating human uses. This is not to deny that it often takes a great deal of human expertise to maintain the functioning of what appears to us as wilderness.[38] But in T1 human use has to be restricted and categorically disciplined by the prerogatives of the natural systems.

The second zone is designated *Rural* (T2). This zone comprises open space where there is some human intervention and habitation, usually associated with recreational and agricultural activity. In this zone, some preservation efforts might be oriented by particular kinds of cultural traditions such as hunting, but in ways closely related to justifying the retention of the place free of any but the lowest density development.

The third zone is *Sub-Urban* (T3), similar in some ways, but not to be confused with what is commonly called "suburban." This is a zone of human habitation where house and lot patterns are relatively low in density. The key difference from the conventional suburban pattern is that these are not monocultural residential zones, and that they are to be limited in extent by proximity to other T zones. This zone includes some mix of uses, including recognition of the reality of home occupations. Although this zoning category supports the market for conventional suburban lifestyles, it would serve the purpose not to segregate but to close mesh of this variety of residential patterns with the other components of human settlement.

The fourth zone is *General Urban* (T4). In the American context, this is the middle landscape that is most complex. Whereas the ends of the transect tend to be very distinctive in either urban or rural character, the T4 standards are set with relatively wide margins, allowing for a great variety of building types, setbacks, and uses. Many urban areas are in the midst of some kind of transition, usually reflected in a patchwork of spot zoning and variances. T4 brings some institutional acknowledgement of these transitions, and it also acknowledges an identifiable place for the messy vitality preferred by some.

The fifth zone is designated as *Urban Center* (T5). This can be the commercial "corner" area of a neighborhood or the "Main Street" of a town. In this zone, the alignment of buildings form a continuous frontage wall, clearly defining the space of the street as a locus for commercial activity, while still accommodating residential uses in appropriate forms. This zone can be applied to protect or project an intensely pedestrian-friendly urban fabric and as a way of enabling the provision of ordinary daily needs within walking distance of T3 and T4 zones.

The sixth zone, *Urban Core* (T6), is reserved for the most intensely urban areas with the highest density of jobs and the locus of civic institutions of regional importance. It supports a typical downtown of a medium-sized or large American city. T6 rigorously maintains the integrity of urbanity and is the zone that most clearly needs and supports forms of transit.

A seventh zone is the *Special Use District*, an exceptional out-of-system category for those places that need to be allocated to a single use in some way: Hospitals, university campuses, large-scale industrial facilities, or anything else that cannot be accommodated within the intrinsically complex transect zones. By retaining a place for such circumstances within the system, it becomes unnecessary to compromise the mandatory diversity of the other zones. Note that the single-use District is the exception and not the norm, as is the case with conventional zoning.

Transect-Based Codes

Transect-based coding approaches the problem of control over urban development in a manner that is fundamentally different in both its goal and functioning from conventional zoning. The transect focuses on the conditions that maintain character and diversity within a series of typologically distinct places. The main focus of a transect-based code is calibration of the mixture of component elements in order to turn what might be problematic adjacencies into symbiotic relationships that give variously urban and rural areas their value.[39] This is in sharp contrast with currently conventional zoning puts emphasis on keeping things simplified and separated so that unfortunate adjacencies can be avoided or mitigated, and so that the aggregate impact of different uses can be measured. For this reason, transect-based codes tend to be generative rather than simply a list of prohibitions. Both systems keep the political and administrative protocols of control and predictable outcomes in place.

There is efficiency and comfort in having a consistent set of categories. Architects can refine a new set of building typologies; traffic engineers can extend the available repertoire of thoroughfares and develop level-of-service measures for normative mixed use; environmentalists can set criteria for a gradient of permissible impacts on nature. In the end, each specialist can retain the prerogatives of their professional disciplines, yet by adhering to the mandatory declension of six standards (rather than the current single standard), they can contribute to the efficient production of complex places. The separate handbooks of the specialists can be reformulated to defined settings—neither the frightening free-for-all of the existing rules, as often results from "planned unit development" ordinances, nor the rigidity of the existing system, which requires endless variances and exceptions in a way that ultimately undermines both control and predictability of outcomes.

A transect-based code constructs a coordinated set of specifications for the component elements of the natural and human habitat, each part potentially delegated to the specialists who design or regulate them but on a common platform integrating the whole. As in conventional zoning, a transect-based code includes the concept of land use, but as one element among others and always subject to the discipline of the urban and architectural configurations appropriate to the place. Each T zone would allow all of the functions (residential, lodging, office, retail, manufacturing), but each in different degrees of mix or intensity. For example, lodging might take the form of a convention hotel in T6 and a bed and breakfast inn in T4, whereas T3 might allow an ancillary apartment for rent.

More subtle distinctions can also be made (e.g., one might be allowed to refinish furniture but not cars as a business in T3).

For example, the frontages—the way the building meets the street—should be arrayed from the most rural to the most urban. The arcade over the sidewalk is the most urban, defining the most pronounced spatial enclosure, then, progressively, the shop front, the stoop, the forecourt, the dooryard, the porch and fence, and the common lawn (see Figure 14.7). The specific types might vary regionally, but the point is that there is a full declension of frontages corresponding to the level of urbanity. By way of contrast, conventional suburban codes effectively allow only two frontages: the 25-foot front yard and the parking lot.

The coding of the streetscape is another example of the transect in action. At the most urban end of the transect, one might see a single species of tree in regularly spaced planters. At the more rural end, the sidewalk has become a path, and the trees become clusters of multiple species in a naturalistic arrangement. This simple gradient controls one of the most common transect abuses: the impulse to green urban centers with berms, naturalistic landscaping, and wandering paths. While such landscaping may be visually attractive, it undermines commerce and the informal social life associated with it.

The example of downtown Fort Myers demonstrates the need for the gradient of responses associated with the transect. The downtown boasts a quarter mile of embankment on the river, but the mangroves have become so thick that one can no longer see the river. It was suggested that the mangroves might be trimmed down to eye level, but this was declared impossible under regulations that do not differentiate contextually between the Everglades and a downtown waterfront. In this way one more reason for living downtown instead of the suburban fringe has been inadvertently eliminated by a standard concerned only with defending the natural condition. This case exemplifies the tendency to homogenize the human habitat toward a common greening that results in a degenerate urbanism that is neither urban nor rural.

For every environmental condition (and every element of the built environment), there should be at least six standards generated. To take the preservation of wetlands as an example: For the set-back from a river running through T1, a mile or two is a reasonable expectation. When the river comes into T3 suburbia, however, it becomes a "riparian corridor" and the set-back requirement could be decreased to 50 feet of intact nature. As the river passes through a T6 urban core, it makes no sense to keep to a standard that prevents humans the reward of access to the water as a feature that enhances the urbanism. (See Figure 14.8.) At the most urban end of the transect, an embankment —as in Paris, London, Chicago, Amsterdam, Rome, or Charleston—should be permitted.

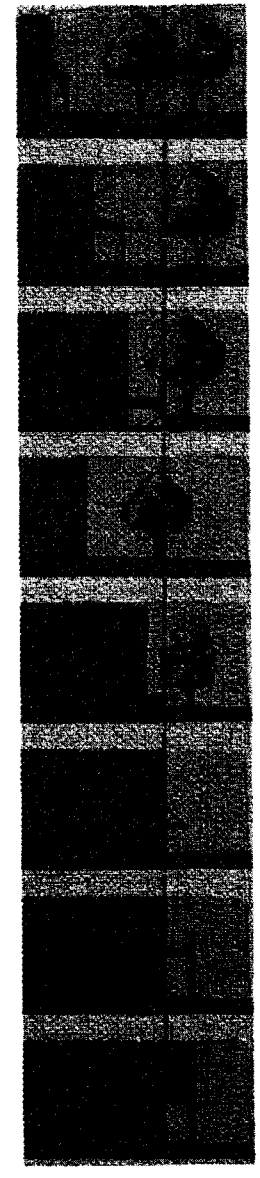

Figure 14.7 A typical declension of frontages across the six context zones, drawn in section. (Source: DPZ)

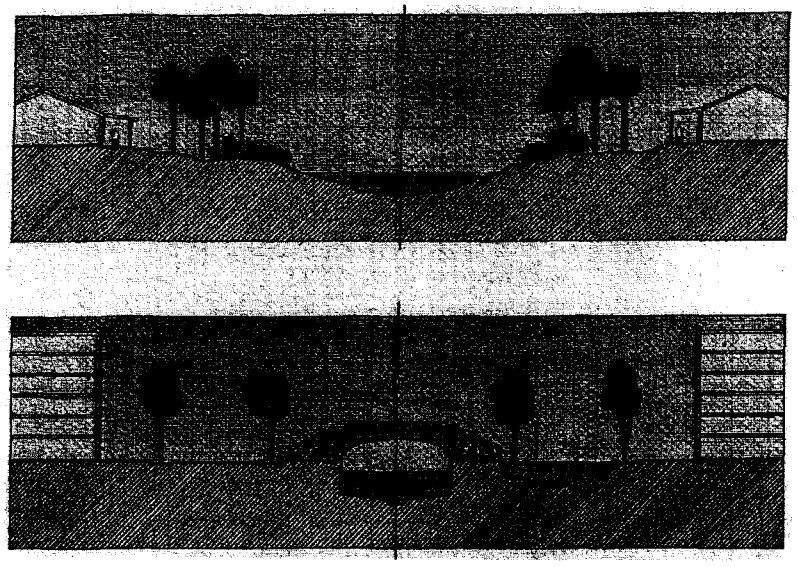

Figure 14.8 From riparian corridors to urban rivers. With respect to environmental standards, there needs to be a differentiation between the rural and the urban conditions. Where it is appropriate to maintain the natural character of the river's banks and the landscape included in a riparian corridor, urbanism both requires and is enhanced by allowing human activity and habitation to approach more sharply defined edges. (Source: DPZ)

Once one has defined the transect zones, forms of human settlement can be understood in terms of a combination of zones. Each type is defined to include at least three different zones. A hamlet consists of T2 and T3, with the T4 just reaching the level of allowing for a corner store. A village has some rural T2, but ranges from mostly T3 to the T5 of a main street area. A town may have T4, T5, and T6. Precluded would be the unrelieved expanses of a single zone that is typical of suburban sprawl. Sprawl is manifested at least as much by its socioeconomic monoculture as by its extent, dependency on the automobile, and consumption of land area at a high rate. By requiring a structured mix of uses within each T-zone as well as a range of T-zones within each community, transect-based planning catalyzes the requisite social and functional diversity, the absence of which creates the environmental impact of automobile-dependent sprawl.

Radical Adjacencies and Successional Planning

Because the transect is represented as a continuum, the diagrams sometimes lead to the erroneous assumption that a community ought to be zoned so that

it builds up centroidally, as in a medieval village. Although it is possible to build in such a pattern, most places simply do not work that way. There are always discontinuities and even radical juxtapositions. Figure 14.9 is a transect analysis of a historic neighborhood near downtown Syracuse, New York. The avenue consists of tall buildings and is a fully developed example of T5. Nearby there is a patchwork of T4, T3, and even a T2 area that is a surviving rural enclave. This radical adjacency between a T2 and T6 zone may be regarded as a positive asset, as in the more famous case of New York City between Fifth Avenue and Central Park. The transect helps to make sense of this kind of idiosyncratic urban fabric and to help decide to maintain it or to allow portions of it to evolve onto the next (successional) transect zone. It is most certainly not intended to be a technique for ironing out urban complexity into a consistent set of concentric rings. The gradient of the transect is an analytical convention not intended to be transcribed onto the landscape. The transect operates like a color wheel, with six primaries that enable a command of the chroma and saturation of a palette while providing the guidance to avoid producing murky colors.

The parametric approach to the standards of a code can provide for reasonable flexibility within each T zone while also minimizing harsh transitions between them. For example, building heights overlap between zones. If one zone is one to four stories, the next zone might be set to three to six stories, and the next to four to ten stories. The areas of overlap are potentially the richest in diversity, allowing for the urban equivalent of what is called "ecotones" in ecology.

This approach also allows the possibility of the urban equivalent of what ecologists call "succession" in natural growth. Succession is analogous to what we would ordinarily consider "history" or the patterns of organic growth associated with traditional cities. The transect-based approach offers this crucial difference from conventional zoning, which is written so that allocations are permanently fixed and as if change in the built landscape were an extraordinary and always problematic event. Changes in density or use require either variances or categorical re-zoning. As these adjustments accumulate over time in extended series of disconnected and poorly coordinated decisions, the result is unlikely to be orderly growth, cumulatively positive outcomes, or political contentment. Both the inflexibility and the disorderly patterns of change are reinforced by the rigidity and over-simplification of conventional zoning. The transect establishes parameters of order while allowing the adaptability that communities require over time. Systematic political consideration of succession in transect zones would avoid "spot zoning," allowing villages to become towns and towns to become cities in the course of time. Only when the urban equivalent of the natural "climax" condition is achieved would a preservationist regime be justified.

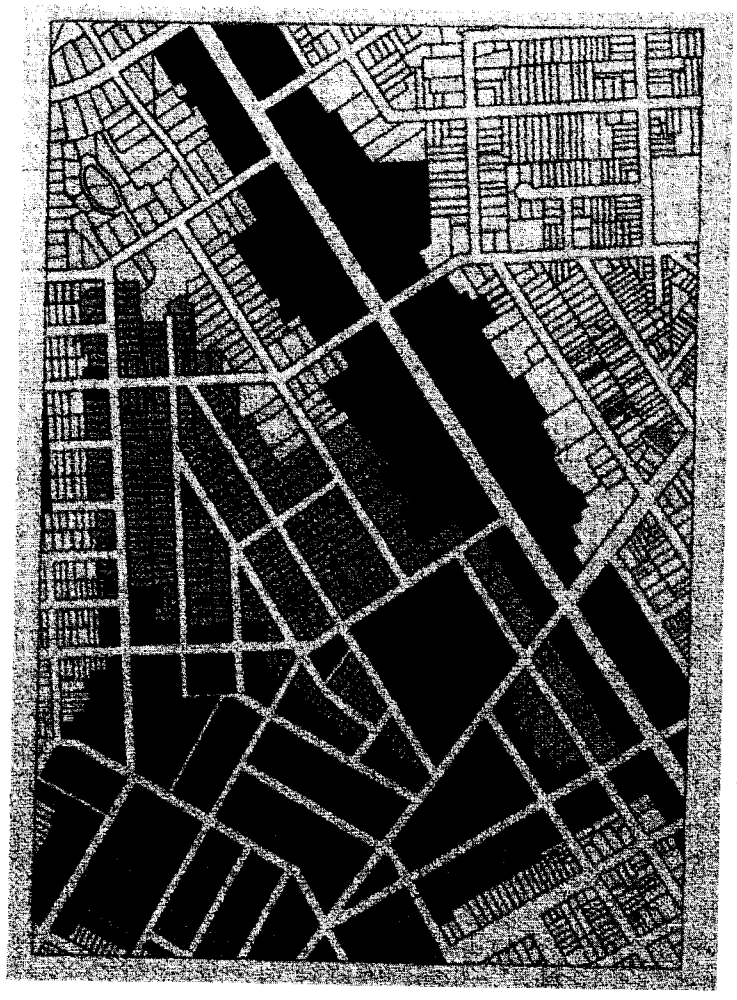

Figure 14.9 The transect in Syracuse, New York. This map of the existing conditions shows a fully developed T6, with nearby patches of T4, T3, and even a T2 that is a surviving rural enclave. (Source: DPZ)

The point of planning, it would seem, is to manage the process of change so that it leads to continual improvement while avoiding undesirable outcomes along the way. A transect-based code offers a way to institutionalize the process of adaptation to changing circumstances, ensuring that component elements can evolve in a coherent manner and avoiding the aberrations and destructive unpredictability that gave rise to zoning in the first place (see Figure 14.10).

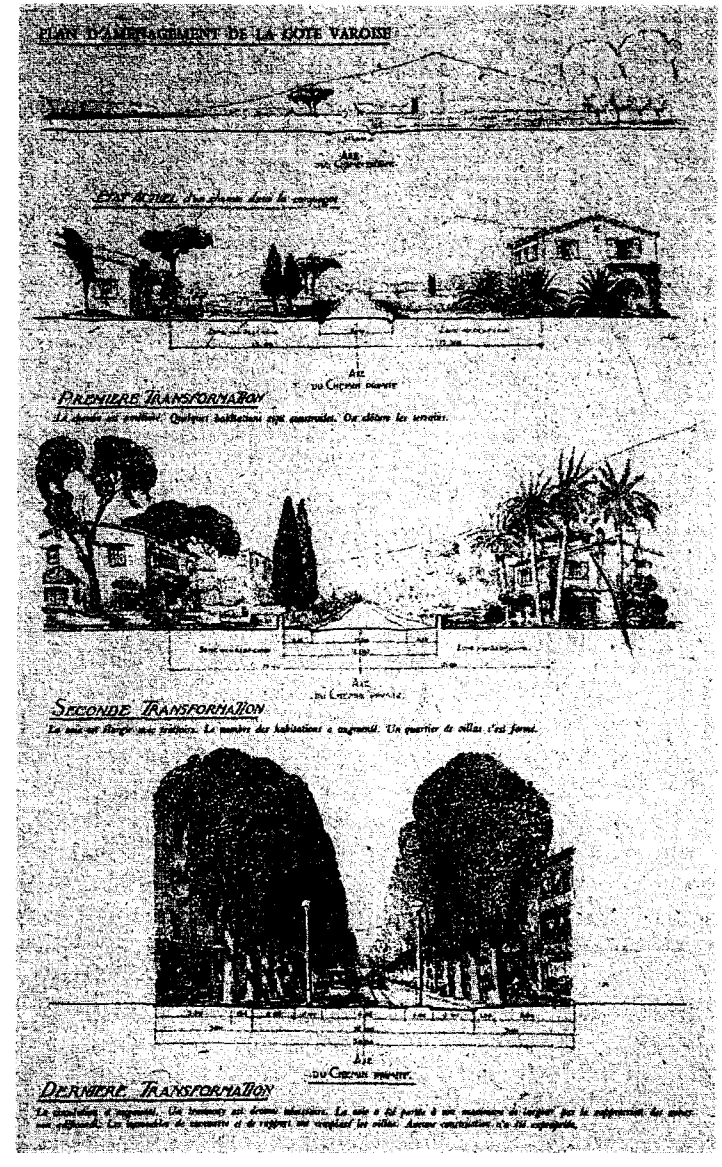

Figure 14.10 Succession along the transect. This image, prepared by Henri Prost in the 1930s, represents the successional potential of the transect. The frontage of the upper image is both earlier in time and more rural than the progressively more urban, later images. Traditional urbanism based on the transect is able to evolve. Urbanism based on conventional zoning cannot readily do so. [Source: T. H. Barnier, *Henri Prost* (L'Academie d'Architecture, 1960).]

Analytical Techniques

It is useful to realize that the transect is not only a synthetic, but also an analytical, technique It is a tool for understanding the urbanism that already exists, as well as for planning for its continued improvement. This is important because the standards of a transect-based code should be derived from an empirical survey of a specific community. The transect of New Haven is not the same as the transect of Santa Fe. The parametric ranges that define each zone are different, and the elements must be locally calibrated. What is constant, however, is that there are always ranges of rural to urban zones. Even across local differences, the consistency of the analytical framework enables comparison that both illuminate variations specific to places and enable planners and designers to learn generalizable lessons that can be skillfully applied in other contexts.

As an analytical technique, the transect is unusually efficient. The current method of surveying a community begins by assessing all streets and buildings, then taking the collected information and boiling it down to a manageable number of elements, such that a code can be written. This is an enormously time consuming and expensive process. Armed with the transect, a planner can study a place in the same way environmental scientists and engineers study a site. They don't scrape off all the layers of earth and rock, analyze them, then put them back. They take core samples of typical areas on the site. They perform a synoptic survey to establish representative places (referents) to be studied thoroughly, and from these are drawn technical data that lead to specific recommendations These analytical techniques include the dissect and the quadrat. The dissect is a section that cuts both above and below the ground to determine flora, fauna, and microclimate, as well as subsurface composition of the soil, humidity, and root structure. The quadrat sets the boundaries of a normative area-for example, an ecologist might mark off a one hundred foot square and then assemble a comprehensive quantitative inventory of the plants and animals found within the sampled area. (See Figures 14.11 and 14.12.) In a similar way, the planner can first identify certain locations that are typical "referents" of each transect zone and then study those examples intensely. The planner can then use the inherently distilled results to develop normative standards that reflect a community's recognition of its best and/or most typical places.

In a 2002 architectural studio at Yale, the transect was used in this way. Students analyzed 10 American cities, each one in three days, collecting only the necessary information to write a code. They were told to go to cities like Santa Barbara, Charleston, Santa Fe, or Boston and to spend a couple of days walking around with an eye to identifying the most paradigmatic urban location (for T6), then the most satisfying sub-urban location (for T3), and then to identify two evenly graded ones between (for T4 and T5). On the third day,

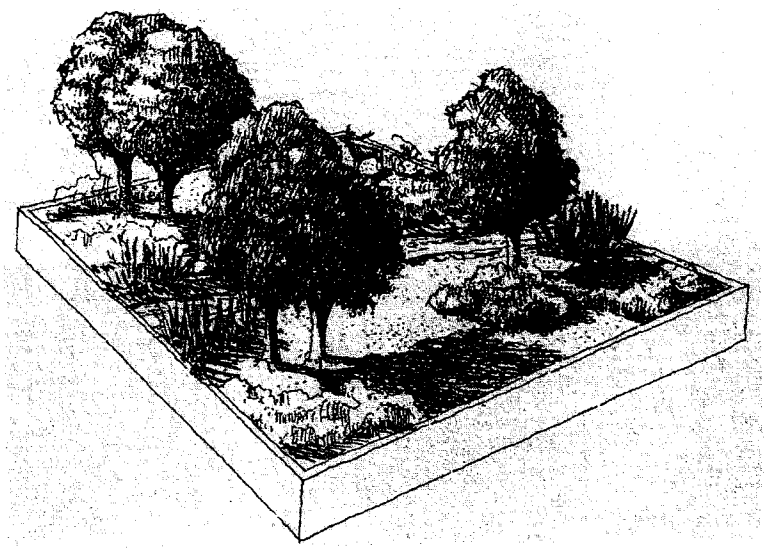

Figure 14.11 The quadrat in nature. This technique involves taking systematic samples from within a designated "boxed area" in order to catalog the typical components and quantities found within a particular habitat. (Source: DPZ)

they were to perform a dissect and a quadrat at each one of their selected locations. The dissect involved photographing, measuring, and quantifying the characteristics of public space and its elements: species of street tree, type of planter, set-back, building height, etc. The quadrat was formed from the lots encompassed by opposing block faces, and the students counted the areas of commercial use, the number of residential units, trees on private and public land, on- and off-street parking, and so on. The result was a quick proto-code, locally calibrated to the distinctive urbanism of the place. (see Figure 14.13).

There is a need to develop such techniques for the sake of economy. American planning has become too elaborate and hence expensive, often putting the necessary skills out of reach of many ordinary communities that need it most. The simplified transect system can be accessible to places with little in the way of budget for planning, perhaps only able to afford to purchase (or copy) standard boiler plate codes. At the same time, the system can be developed to a level of technocratic mystique equal to that of any other of the quantitative specialists in the political process: the traffic engineer, the environmentalist, and the developer. Armed with the conceptual precision of a transect-based analysis, the planner (often the sole generalist) can put forward

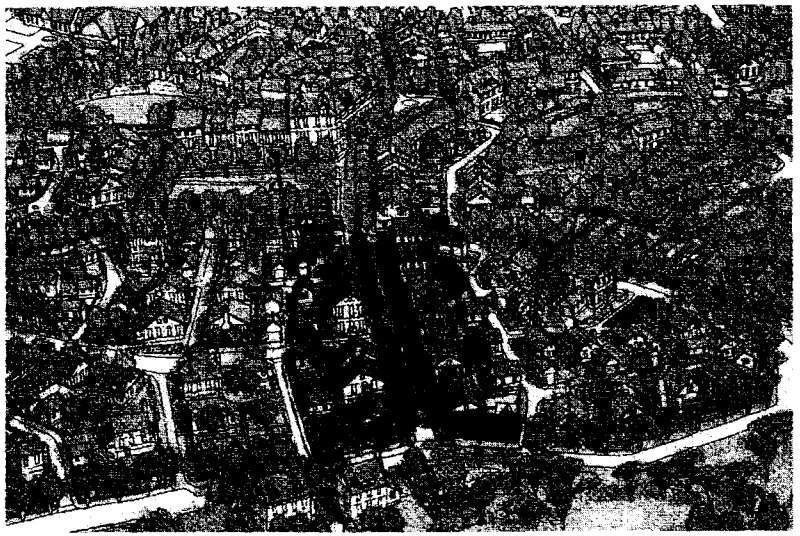

Figure 14.12 The quadrat technique applied to urbanism. In order to apply this technique fruitfully to an urban–rural transect, one takes both sides of the street along a single block. This sampling technique makes it possible to characterize the transect zones with empirical and quantitative precision. For example, one can begin by counting doorbells and parked cars to get an accurate picture of the existing density. (Source: DPZ)

propositions responsive to the broad range of human concern, with clarity and authority no less founded in data than the specialists who look after the interests of cars, trees, storm water, or various animal species.

The Promise of Post-Suburban Planning

If one takes a square mile of conventional suburban development, an assessment will often find most of the elements of a town, with "some assembly required." The growth of the last decades has provided everything necessary for towns, but the individual has to drive around all day to put it together. As a result there are none of the benefits of urbanism—neither the convenience nor the quality of human experience, neither the public realm nor the opportunities for civility. Many of the problems in the modern development industry result from the way planning practices reinforce the homogenizing protocols involved in managing large aggregations of capital; the simplifications associated with technocratic administration; and the legal practices that have been shaped by responding to and reinforcing the tendencies of an impersonal regulatory system.

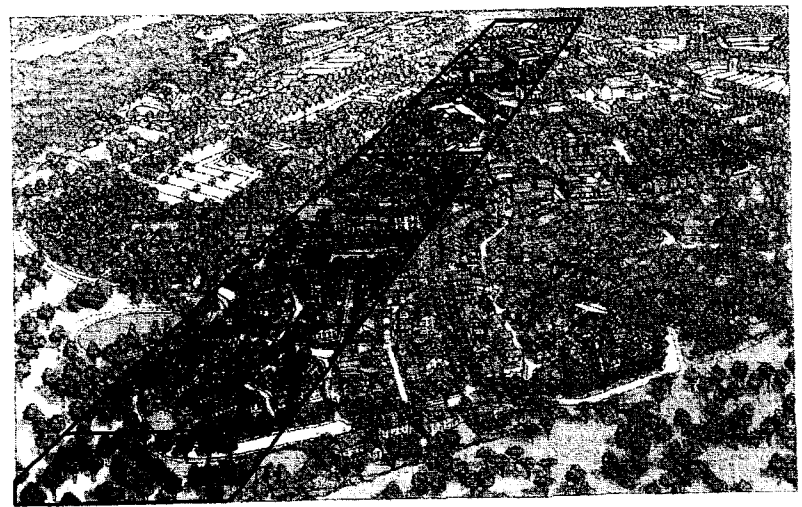

Figure 14.13 The urban transect applied. As an analytical system, the transect is the basis for efficient and precise study of existing urban fabric, in a manner that simultaneously integrates environmental considerations. Analysis moves from the synoptic level of the transect to more detailed sampling of specific locations, using techniques also derived from the methodology of the ecologists: the dissect and the quadrat. (Souce: DPZ)

The solution is not as simple as just getting rid of regulation, as these practices are now thoroughly institutionalized in the supply side of the market and reflected in attitudes and expectations on the demand side.

The prospect of what may be called post-suburban planning is likely to depend on our ability to install a comprehensive theory of urbanism in a form that is compatible with the existing legal frameworks and to harness this theory to the politically powerful ethos of environmentalism.

The transect provides a theoretical basis for integrating a science of both natural systems and human settlements into planning and policy. It enables an understanding of the broad ecological picture that doesn't fetishize nature or make it impossible (as some environmentalism tends to do) to organize environmentally acceptable choices into politically sustainable patterns, or to respond systematically and intelligently to the challenge of creating human habitat that is dense, compact, and connected.

Conventional assessment techniques currently measure ecological impact in a way that tends to favor low-density suburban development. Ecological performance shows steady decline from the moment a human steps foot on the

scene, and becomes almost completely degraded in the urban core. Such conclusions are drawn from the fact, for example, that water filters through to the aquifer more easily when the density is lower and pavement therefore less. However, such a measure makes no sense at the regional scale, when maintaining low densities in order to address water quality issues has the ultimate result of spreading human impact more widely, disrupting more of the natural systems and multiplying secondary impacts such as atmospheric pollution through increased traffic. The specialized science of environmental assessment tends inadvertently to encourage the position that the "solution to pollution is dilution," the idea that spread out, humans won't do as much damage. This view is persistent, in spite of the evidence that spreading humans more thinly on the ground has been shown to be as damaging to social, economic, and political health as it is to the natural environment. And the result is that policies driven by this kind of thinking exacerbate the political difficulties, as accumulations of well-intended actions lacking overarching vision lead to consequences that are plainly socially, economically, and ecologically damaging.

When the appraisal of environmental impact is reconsidered from the standpoint of an integrated, transect-based theory, ecological performance drops instead in the middle ground of suburbia (T3), where the efficiency in the human consumption of land is not enough to balance its hidden and secondary impact on natural systems (see Figure 14.14). This is particularly true insofar as the naturalistic appearance of the suburban landscape actually masks deeply disrupted natural systems (e.g., the effects of soils compacted, plantings that require irrigation and chemical treatment, and atmospheric pollution that results from extended travel distances). Measures of ecological performance must take into account the efficiencies as well as the impacts associated with the variety of urban settlement patterns. To the extent that humans are attracted by the social values embedded in urbanism, they feel less compelled to use nature as a buffer between themselves and their fellow humans, and hence less likely to insist on large lots and monocultural residential areas. Ecologically, the most efficient pattern of human settlement is dense, compact urbanism, traded off symmetrically against carefully preserved areas, and certain lower-density sub-urban settlement areas. In contrast with a settlement pattern reflecting the mix and diversity of transect-based development, conventional suburban development produces a consistently low level of both social and ecological value across the whole transect.

The transect system measures the exchanges required by growth in a systemic way, integrating the measurement of environmental and social performance. As a regulatory technique, it offers opportunities for sophisticated transactions, not just the painful downward tradeoffs that have given growth its uniformly bad reputation. A properly systematic assessment could encourage efforts to achieve the higher scores at the ends of the transect, as the more

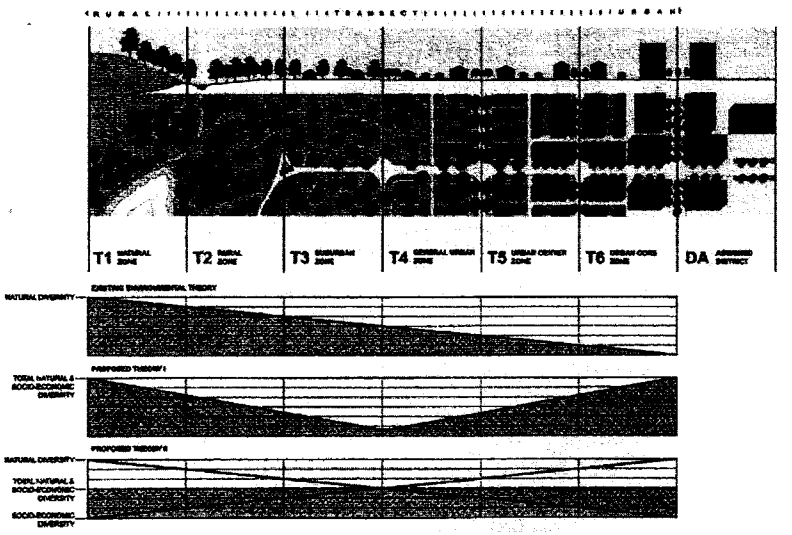

Figure 14.14 Environmental and Social Performance Measures. According to conventional measures, environmental performance declines consistently as one moves from the most rural to the most urban areas. This curve might be conceptualized as a decline in natural diversity. The transect suggests two alternative theories. In the first theory, the decline in natural diversity is compensated by the increase in socioeconomic diversity (as a kind of proxy for the health of the corresponding ecologies). In the second proposed theory, it is suggested that the exchange might be managed so that an achieved balance represents an optimizing of both natural and social capital. (Source: DPZ)

rigorously urban zones (T4, T5, and T6) sustain economic and social values. Residents of such zones may not so readily want to leave them for large-lot subdivisions if the absence of a yard large enough for private amenities were compensated by the attractions of a truly lively street life and the resources of an urban public realm. Overall, transect-based planning could optimize the curves defined by the whole system of tradeoffs between maintaining natural ecological conditions and producing forms of habitation that meet the full range of human needs and values. In this way, we are most likely to make substantial progress toward sustainability in the widest sense.

In contrast, the environmentally driven regulatory impulse to green the city ends up suburbanizing even the urban core and undermining the advantages and amenities of urbanism, reducing it to a poor substitute for real suburbia and creating an uncompetitive component within the overall market. Not many are interested in trading in the large yards and easy parking that provide

the comforts and convenience of suburbia without the compensation of the pedestrian interest and convenience of dense urbanism. Transect-based urbanism would keep humans contained not by the proscription of an urban boundary, but by desire and choice. There is ample evidence of this: Substantial numbers of people willingly select (and pay a premium for) an urban lifestyle wherever authentic urbanism is still to be found.

As a technical matter, the transect makes it possible to think in precise terms about an environmental science that is geared to a comprehensive ecological solution—one that achieves the kind of specificity required to create regulations that can be administered by existing technocratically oriented administrative protocols. As a matter of politics, the transect makes it possible to bring clarity to the choices that citizens need to make in the political discussions that attend (and should attend) growth. The conceptualizations and analytical representations enabled by the transect system can help citizens understand the forms and nature of urbanism in a way that enables them to make informed and rational choices about the future of their communities.

Perhaps the most important asset of transect-based planning is that it is inherently oriented toward the market, toward providing an array of places that are desirable for those who have a choice of where to live. This includes the American middle class, whose lifestyle will otherwise continue to be a root cause of some of the most destructive environmental problems we face. It also implies the possibility of integrating places for people who have historically been faced with little choice, precisely because of the way a transect-based system helps to expand the range of choices in building mixed-use and mixed-income communities. Thus it holds promise to reconcile the environmental ethos and the concerns with social equity that have typically been represented by the political left with the expansion of "choice" as exercised through the free market that is the central conviction of the political right. The problems that confront us do not otherwise hold even a glimmer of the promise of resolution, short of the agonies of long economic emergency that might render some of these discussions moot, but that none of us should wish upon the nation.

Notes and References

1. See Adam Rome, *The Bulldozer in the Countryside: Suburban Sprawl and the Rise of American Environmentalism* (Cambridge: Cambridge University Press, 2001).
2. See the Charter of the New Urbanism, reprinted with detailed commentary in *The Charter of the New Urbanism*, eds. Michael Leccese and Kathleen McCormick (New York: McGraw Hill, 2000).
3. See Roderick Nash, *The Rights of Nature: The History of Environmental Ethics* (Madison: University of Wisconsin Press, 1989) for an illuminating discussion of the ideological roots of this perspective.
4. William Cronon, "The Trouble with Wilderness; or, Getting Back to the Wrong Nature: Rethinking the Human Place in Nature," in *Uncommon Ground*, ed. William Cronon (New York: Norton & Co, 1996):81.
5. See James Collins et al., "The New Urban Ecology," *American Scientist* 88, no. 5 (September 2000).
6. Rome, 221.
7. Ironically, some of these standards also enforce an inappropriate urbanization in rural areas, requiring a highly engineered stormwater infrastructure that forces developers to be more destructive of the land than they would otherwise need to be.
8. See discussion of William Rees's concept in Timothy Beatley, *Green Urbanism* (Washington, D.C.: Island Press, 2000): 19–20, and Timothy Beatley and Kristy Manning, *The Ecology of Place: Planning for Environment, Economy, and Community* (Washington, D.C.: Island Press, 1997).
9. Not per capita consumption, where they are more efficient than suburbia, but absolute measures that are then translated into open space consumed in the city's support. This is the very recipe of anti-urbanism. Properly applied, the technique of analyzing an ecological footprint can be a useful measure. However, it tends to be used only to reinforce the sense of environmental destruction wrought by urbanism.
10. For example, as Michael Mehaffy has pointed out to us in discussions of London, measures of the ecological footprint of the city of London have not taken into account the fact that the city supports a tourist population as well as residents.
11. William Cronon provides an important alternative view of the relationship of the city to the reshaping of its region in *Nature's Metropolis: Chicago and the Great West* (New York: W. W. Norton, 1991). Cronon's account of the wide-ranging impact of Chicago's development on the development of the whole region raises questions regarding the status of nature in relation to the city, as well as the appropriate boundaries for analysis of the relevant ecocycles that make up a city.
12. See *New Urban Post III* (March, 2002).
13. Beatley and Manning, 88.
14. There have been many influential books about urban nature and ecosystems, from Ian Mcharg's *Design with Nature* (New York: John Wiley & Sons, 1992), to Anne Whiston Spirn, *The Granite Garden: Urban Nature and Human Design* (New York: Basic Books, 1984), to John T. Lyle, *Design for Human Ecosystems: Landscape, Land Use, and Natural Resources* (Washington, D.C.: Island Press, 1999). In each case, these discussions are strong on the analysis of natural ecosystems and weak on the form and substance of the qualities of the human settlements that might warrant any sacrifice of nature as anything other than unfortunate and unavoidable.
15. In the case of a project that Duany Plater-Zyberk & Company has worked on in Hillsborough County, Florida, the requirement for a certain number of trees was met by making a reservation on one side of the project, planting great numbers of trees in it, and taking the trees out of the urbanized area. As a result, the whole project is lined with trees on the edge, just to get the mandatory number of trees because they each needed 120 square feet and there was no way to accommodate them within the street section.
16. Later, we discuss the idea of the successional tendencies of healthy urbanism, and the way conventional zoning and suburban patterns interfere with the ability of communities to change (or improve) over time.

17. To be sure, those mistakes are now being corrected with more attention to the issues of transit and the patterns of urban development. One recent scholarly paper attempted to measure the success of Portland's efforts, and the measures indicate substantial success in the war against sprawl at the neighborhood level, whereas there has been less measurable success at the regional level. Yan Song and Gerrit Knaap, "Measuring Urban Form: Is Portland Winning the War on Sprawl?" (2002) (forthcoming).
18. Kentlands, among others, has been criticized in this way.
19. As Leinberger observed: "Thus, the real estate development industry now has 19 standardized building types—a cookie-cutter array of office, industrial, retail, hotel, apartment, residential, and miscellaneous building types. These projects are easy and cheap to finance, build, trade, and manage. To take one example, a 'neighborhood center' will always be built on a 12 to 15 acre site, with 20% of the space set aside for building and the remaining 80% dedicated to parking. The center will invariably be anchored by a 50,000 to 70,000 square foot grocery store, a 20,000–30,000 square foot drugstore, and in-line shops occupied by national chain retailers. It will draw its customers from 15,000 households in the 'neighborhood' in a 3 to 5 mile radius."
20. You can see the effects of this logic very clearly in the illustrations of the method of designing "conservation subdivisions." First, you identify the areas on the site that are to be preserved (wetlands, slopes, greenway connections, etc.). Then you lay out the roads to provide access to the pieces left over. See, for example, Randall Arendt, *Conservation Design for Subdivisions: A Practical Guide to Creating Open Space Networks* (Washington, D.C.: Island Press, 1996).
21. The greenways were entirely artificially constructed to simulate wetlands eliminated by farming in the 1940s.
22. As noted, not only "rare" or "designated" but even "listed"—a lesser standard—is now considered sufficient cause for concern.
23. William Shutkin, *The Land that Could Be: Environmentalism and Democracy in the Twenty First Century* (Cambridge: MIT Press, 2000): 18–19.
24. See also Carmen Siriani and Lewis Friedland, *Civic Innovation in America: Community Empowerment, Public Policy, and the Movement for Civic Renewal* (Berkeley: University of California Press, 2001).
25. Shutkin, 14.
26. Malcom Barbour, "Ecological Fragmentation in the Fifties," in *Uncommon Ground: Rethinking the Human Place in Nature,* ed. William Cronon (New York: W. W. Norton, 1996): 234.
27. Ibid., 237
28. As an aside, one might observe that a political limitation of modernist architecture has been a reflection of the refusal on the part of many modernists to elaborate conventional means to express this kind of sensitivity to context or to cooperate in this kind of encoding of meaning in built form.
29. See Emily Talen, "Help for Urban Planning: The Transect Strategy." *Journal of Urban Design* 7, no. 3 (2002): 293–312.
30. The urban sociology of the early twentieth century and the so-called urban ecology models operate according to this kind of logic.
31. Sidney Brower, *Good Neighborhoods: A Study of In-Town and Suburban Residential Neighborhoods* (Westport: Praeger, 1996).
32. Ibid., xiv.
33. Ibid., xiii.
34. Laurie Volk and Todd Zimmerman, "American Households on (and off) the Urban-to-Rural Transect," *Journal of Urban Design* 7, no. 3 (2002): 341–352.
35. Ibid., 343.
36. Ibid., 344.
37. The transect as a basis for coding has been used by the firms of Moule & Polyzoides, Dover/Kohl, Torti-Gallas, Mouzon & Associates, and Duany Plater-Zyberk & Company. There are more, but these are most familiar to the authors.
38. For a discussion of the problem of "wilderness," see William Cronon, "The Trouble with Wilderness; or, Getting Back to the Wrong Nature: Rethinking the Human Place in Nature," in *Uncommon Ground,* ed. William Cronon (New York: Norton & Co, 1996): 69–90.
39. See Emily Talen, *Urbanism in America, Ideals, Connections and Conflicts* (forthcoming).

CHAPTER 15

Substituting Information for Regulation

In Search of an Alternative Approach to Shaping Urban Design

J. MARK SCHUSTER*

My intent in this chapter is not to present research results, nor is it to criticize (or praise) regulation. My intent is to raise two questions: Are there viable alternatives to regulation, and if so, where might we look for models? I will do so by suggesting one place to look.

The standard critique of regulation is made quite clear in other contributions to this volume: Regulation is inefficient, ignoring important market signals as to what is desired by individuals in society in its pursuit of a broader, loosely specified "public interest"; moreover, regulation visits the costs of serving that broad public interest on the few who are regulated—the few pay for the benefit to the many. Some of the authors call for *less* (or *no*) regulation; others call for *better* regulation. Perhaps those who are calling for better regulation are also calling for *more* regulation—it is a little difficult to tell, although some readers may detect hints of that stance lurking behind arguments that have been more benignly presented.

I wish to propose a different tack.

* I am grateful to Amy Brown, Dan Cohen, Constance Bodurow, and Kitty Hannaford for their invaluable assistance with this project.