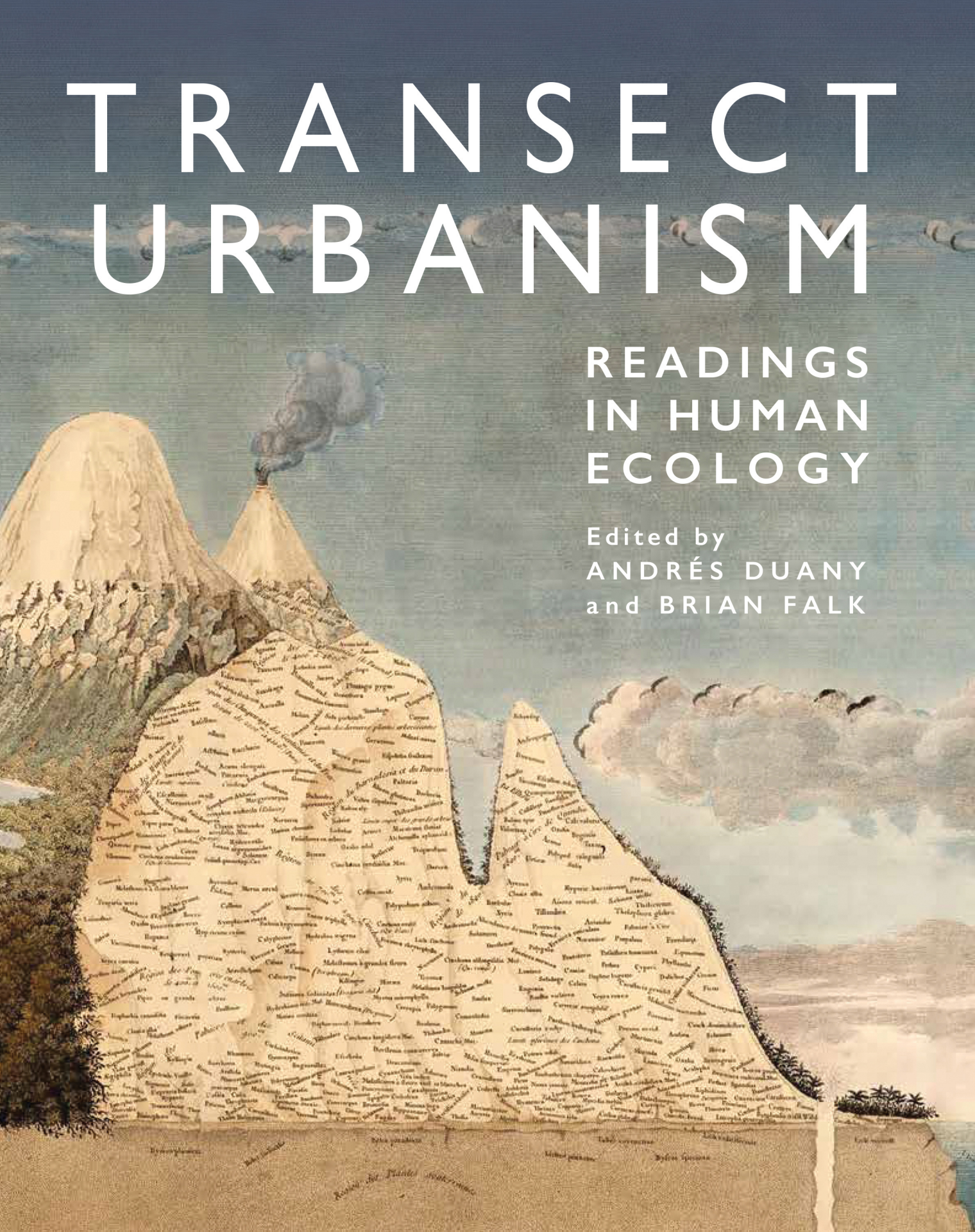
TRANSECT URBANISM

READINGS IN HUMAN ECOLOGY

Edited by
ANDRÉS DUANY
and BRIAN FALK



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PREFACE

PART ONE: IMAGES

ORO Editions

PART TWO: TEXTS

Dedicated to Sandy Sorlien,
who has been a leader and martyr, the Joan of Arc of the Transect.

ACKNOWLEDGMENTS

The editors wish to thank the many contributors to this book. Many others have created images and essays that regretfully could not be included here, but who have also advanced the understanding and implementation of the Rural-to-Urban Transect.

Sandy Sorlien was perhaps the Transect's greatest champion for several years, serving as managing editor of the previous version of the SmartCode and as the former technical director of the Center for Applied Transect Studies. Among the others who have made significant contributions to the practice are Hazel Borys, Nathan Norris, and Ann Daigle. We are also grateful to Susan Henderson and Matthew Lambert, who have worked to update the SmartCode in recent years.

Several people contributed to the design and layout of this book over the years. All were employees of DPZ CoDesign, which donated their time and expertise to this project. Of special note is Joanne Braga, who did the majority of the final graphic layout.

CENTER FOR APPLIED TRANSECT STUDIES

The Center for Applied Transect Studies promotes understanding of the built environment as part of the natural environment, through the planning methodology of the Rural-to-Urban Transect. CATS supports interdisciplinary research, publication, tools, and training for the design, coding, building, and documentation of resilient communities.

A TECHNICAL INTRODUCTION

ANDRÉS DUANY

I have in my office a bookshelf reserved for the publications I use as reference. They typically display clear language and good graphics, and they provide practical advice on creating communities that are compact, diverse, and walkable. These are superb publications, and there are considerably more of them on this shelf than there were just 10 years ago.

More than a few urbanists know what they are doing (at long last!). And there is ever more evidence of this happy phenomenon. Editions of New Urban News identify hundreds of neighborhood-scale communities under construction and seeking permitting.

One would hope this published knowhow and the number of built projects would make obsolete Jane Jacobs' statement that "The pseudoscience of planning seems almost neurotic in its determination to imitate empiric failure and ignore empiric success."

Alas…apparently not. Each New Urbanist project encounters resistance unabated. Each requires a tremendous educational and political effort, as if it were an experimental first attempt. Like Sisyphus, the New Urbanist must begin at the bottom, pushing the project uphill against the inertia of the civil engineers, municipal officials, developers, building inspectors, elected officials, neighbors, environmentalists, marketing experts, loan officers, and all the rest. The difficulty encountered is astonishing. Even though the outcome—sprawl—has clearly been shown to be socially dysfunctional, choked in traffic, hideous, reviled by the public, and ecologically disastrous, there is resistance still! Sprawl continues to make up the vast majority of new development. Why?

Simple explanations are on offer: intellectual sluggishness, bureaucratic inertia, comfort with the status quo, aversion to risk. But there is something else at work, something fundamental and deeply embedded: this system is comprehensively organized by a unified theory.

Evidence is found in the coordinated activity of each disparate planning specialty. The analytical methodology of the traffic engineer is dependent on the precise functional segregation of single-use zoning. Absolutist environmental standards require geographic

discontinuities that perpetuate the pod-like, single-use zoning diagrams. Environmental crossings are minimized by dendritic systems of thoroughfares that, as it happens, lend themselves to the traffic engineers' analysis. Lending institutions have standardized checklists that encourage the kind of large, homogeneous projects that can be minced and converted into "financial instruments," which, as it happens, translate perfectly into the stair-step densities of the zoning categories. Realtors are conditioned to place high values on the Standard Real Estate Products enabled by those selfsame homogeneous zones. There is underlying evidence that what has been presented as a neutral, market-oriented and technocratic system is, actually, heavily biased toward a certain model—suburban sprawl. Reform is resisted by a unified theory—nothing less.

Origins of the Theory of Suburban Sprawl

The dominant historiography of modern planning (which is to say, suburban sprawl) presents a sequence of empirically evolved, quasi-inevitable practices that have been professionally rationalized into a system based on "zoning." It is certainly true that a model based on the cellular categorization of zoning and its reconnection by a dendritic thoroughfare system is conceptually very elegant (dismal as the built results have been). But a different meaning of "rationalized" might be more applicable. The standardized protocols and pervasive statistics of planning may imply objectivity, which fits well with the American sense of equal treatment under the law, but more importantly, they allow bureaucrats and elected officials to use statistical analysis and numerical prescription as rationales for their decisions. This system is congealed around the undeniable advantage that it is easy to administer, lending itself to both the numerical prescription and the statistical analysis of potential outcomes that provide plausible rationales for the decisions of bureaucrats and elected officials.

There is, however, another possible history, one which posits that modern planning did not gradually evolve from empirical feedback, but rather arrived fully formed and hanging on the tail of the brilliant 30-year campaign to establish modernist architecture. Behind the current zoning system lie the theories promoted since the 1930s by Le Corbusier and his fellow polemicists of CIAM. This alternate genesis seems incredible to the planning profession, which "knows" that case law, protocodes, and empirical studies formed the fertile sediment.[1] It is evident, however, that this system proliferated worldwide over a firm theoretical foundation provided by Le Corbusier. Modernist/Corbusian/CIAM theory, in the immediate post-war period, cast aside both the Anglo-German empiricism of Unwin and Sitte and especially the Franco-American City Beautiful system that were its polemical nemeses. It left standing only the insipient City Healthy & City Efficient of the civil engineers, and the City Progressive of the reformers, all leading to a fusion of formidable technocratic credibility and ethical imperative.

This is not the place to detail this evolution, which hopefully will soon be only history. What is relevant to this volume is that there is a deeply embedded theory coordinating the current planning system, allowing it to persist despite its empirical failure. The weight of New Urbanist work, which is relatively uncoordinated, will not tip the scales of reform until there is an alternative comprehensive theory.

But before engaging in an attempt to provide such a theory, has there been no prior comprehensive attempt at reform? Only one: the environmental movement, specifically as translated into a design protocol by Ian McHarg. His *Design With Nature* sets forth environmental determinism as an alternate paradigm. Propelled by crisis no less than by hard science, McHarg's method is currently administered by environmental bureaucracies everywhere. It would be a contender to instigate reform if it were indeed comprehensive. The problem is that the protocol of *Design With Nature* stops where the green space ends. It does not include, nor does it make a proposition for, the human habitat. Because it offers no guidance for the design of urbanized areas, the many McHarg-influenced developments, such as the Woodlands in Texas, Hilton Head in South Carolina, Sea Ranch in California, and Amelia Plantation in Florida, offer only standard, single-use zoning, albeit in a "cluster" aesthetic. Outside of the preserved natural spaces, the developed areas of these projects remain, in their socioeconomic and environmental performance, indistinguishable from sprawl: everyone drives everywhere for everything.

Until very recently, the environmental movement neglected to create a proposition extending into the city. Hence the hidden failure of Portland's 20-year regional planning epic: most of what has been built within the achieved urban boundary has been suburban sprawl. And the recent green building movement has not been equipped to create urbanism—tending only to symbolize it.[2] Unfortunately, such greening does not create the most livable cities; it tends to create pretty sprawl. This brings us to the present impasse: today's pervasive "Landscape Urbanism" is propelled by an urban development system that is a combination of convenience and suburban sprawl. Despite its environmental credentials, it paradoxically reinforces the longevity of sprawl by aestheticizing it. What can be done? To be efficient, reform of the still-neglected urbanism within the urban boundary must be based on an extension of the embedded environmental ethos and methodology. This would have the advantage of familiarity within thousands of planning agencies, and it would be propelled by the tremendous political energy of the millions dedicated to an environment ethic.

What remains to be done is to extend the environmental protocol of McHarg into the city. This can be accomplished by deploying the Rural-to-Urban Transect.

Short History of the Transect

A transect is a scientific method for studying habitats, among other subjects. Following a fixed path through a given area, the observer notes the number, location, and distribution of various elements of interest. Its use in ecology inspired its adaptation for urban planning and design. The Rural-to-Urban Transect, known simply as "the Transect," allows for the identification and allocation of the various elements of urbanism, based on their suitability for given types of environments. Underlying the Transect is what used to be known as a natural law, which is defined as a principle derived from the observation of nature, and by right reason is thus ethically binding in human society.[3] The Transect's rural-to-urban declensions emerged organically in the natural/cultural evolution of human settlement, preceding its explicit conceptual formulation in the 18th century. That such a declension is timeless and cross-cultural can be easily experienced by walking from the center to the outskirts of Pompeii, or observed in the depiction of settlements in ancient Chinese scrolls. This pattern of development structured most towns and cities built before the advent of modern zoning, ca. 1930–1970. The Transect as a natural law is immanent, but its complete suppression by modernist planning protocols catalyzes the current need to re-present it as a theory toward an alternative, unified planning system.

The first explicit conceptual formulation of a scientific transect was created by Alexander von Humboldt in 1793 and illustrated by Joseph Meyer around 1860. It is thought to have been taken across the southern tip of South America, based on Humboldt's explorations from ocean to ocean, and includes taxonomic elements on and below the surface, as well as atmospheric conditions.

After Humboldt's transect, which analyzed only the natural aspects of habitat, the second appearance of a transect as an intellectual construct was a century later when the "Valley Section" was conceptualized by Sir Patrick Geddes. Geddes diagrammed a generic transect as a geographic section taken from upland to waterfront. It articulated a series of human (economic) societies ranging from hunters in the highlands to farmers in the foothills, to tradesmen along the shores. It was the first transect that included human activity corresponding with the declension of natural habitats. Humans were considered part of the habitat, if not yet "within nature," as the human symbiosis was framed exclusively in terms of nature's exploitation.

Why so questionable a proposition from an acknowledged multifaceted genius? It seems that Sir Patrick understood the ordering potential of a transect, but he could not transcend the limits of a time when nature was not conceived as a protagonist. Nature was there to be subjugated by humans. As stated in the previous introduction, both *On the Origin of Species* and the Old Testament provided support.

The next great proposition of the a transect appeared in *Design with Nature* in 1969—also by a Scotsman, Ian McHarg. A transect was immanent as a result of McHarg's analytical protocol. His transect was more scientifically sophisticated than Geddes', but less comprehensive, being entirely a progressive defense, by definition, of natural habitats, with the social habitats to be located in the low-value residue, and no further proposition regarding the areas to be inhabited by humans. McHarg's great contribution was that his transect was made operational by a series of transparent overlays designed to discover values of the land. The process progressively removed tiers of ecologically sensitive land from the realm of potential development. *Design With Nature* was the origin of legislated environmentalism, as it is a process objective enough to be defended in a court of law.[4]

Current environmental laws are based largely on the extension, technocratization, and legalization of this methodology. McHarg, however, did not make equivalent propositions for those residual areas to be urbanized. This omission confirmed the latent human/nature opposition that now pervades the environmental ethos: nature is sacred, and the city profane. The application of *Design With Nature* has led to four decades of community designs that are environmentally well-intentioned and aesthetically green, but otherwise identical to sprawl in their socioeconomic and carbon effects. This is the reality of Columbia in Maryland, Reston in Virginia, the Woodlands in Texas, and other "new towns" of that vintage—now found in full revival as "Landscape Urbanism." Though all include copies of New Urbanist town centers, the rest of the areas are extremely diagrammatic, with market-segmented housing pods, shopping centers, and office parks all duly buffered by the protocol-designated "environmental" preserve areas. The priority given to natural continuities cauterizes the thoroughfare network, which reduces walkability and the feasibility of transit, therefore increasing driving and making the few arterials that do connect quite congested given the typically low density of the residential areas. This model has failed because of an absence of a corresponding theory for the urbanized areas.

About two decades after *Design With Nature*, Christopher Alexander made a subsequent transect proposition in *A Pattern Language*. This is by no means as explicit as the prior ones. Rather, it is implied by the series of patterns, principally Nos. 2, 14, 29, and 36. Taken together these form a transect, but it is lost in the other 252 patterns. Alexander did not recognize it as the general theory capable of reconciling urbanism and environmentalism.

Re-Emergence of the Transect

The current manifestation of the Rural-to-Urban Transect is a result of the compilation of *The Lexicon of the New Urbanism* from 1994 to 1998.

In 1994, the Congress for the New Urbanism was organized around nine task forces, one of which was chartered to establish a common nomenclature. This group proposed to create a lexicon conceived as an alphabetized list of useful terms accompanied by their definitions.

This soon foundered, as it became apparent that most of the elements to be defined could be understood properly only in relationship to others. In authentic urbanism, the same as in true environmentalism, a tug on any one thing rustles something elsewhere. Rather than alphabetical order, urbanism called for its terminology to be grouped as taxonomies of related terms.

This established, it seemed natural to classify the terms within each taxonomy according to a declension convenient to each. For example, to array open spaces according to environmental performance, thoroughfares by relative traffic capacity, and building types according to the ratio of lot area occupied.

However, such disparate declensions did not support the organic conception displayed by authentic urbanism. They tended, instead, to reinforce the isolation of specialists—planners, traffic engineers, environmentalists, urban designers, landscapers, architects, land use attorneys, developers, bankers, and marketing experts—that has built the precarious Babel of current suburban-sprawl practice.

This characteristic of modern planning is the origin of its failure. Despite being implemented through a sequential protocol that engages all the specialists, the resulting plans are not properly integrated. Each profession is permitted to impose its perquisites, with the result typically being a collection of urban elements rather than urbanism itself. Thoroughfares are designed exclusively for the statistical traffic flow; the salvageable natural environment is scientifically circumscribed. Shopping centers, office parks, and residential enclaves are allocated in zoned isolation. Self-referential architecture ignores the thoroughfares while ornamental landscaping ignores the buildings. Such places, when they mature, are sometimes called "edge cities." They contain all the statistical elements of towns and cities, but they are really only cartoon versions of the real things.

The search for a theory to correlate the taxonomies yielded the chance re-discovery of the transect. A transect has heretofore been understood as an ordering system deploying a geographic gradient to arrange the sequence of natural habitats. This conception of the transect proves to be extensible to the human habitat, as every component of urbanism also finds a place within a continuous gradient of rural to urban. Combining aspects of the scientific method and the cultural analysis begun by Geddes, the transect proved extensible into the built environment, as all of the components of urbanism are suitable for certain environments along a gradient from the most rural to the most urban. For example, a street is more urban than a road, a raised curb more urban than a swale, a brick wall more urban than a shingled one, an allée of trees more urban than a clus-

ter. And there is a declension in between: even the character of public lighting can vary from metropolitan to rustic according to fabrication of streetlights from sculptured cast iron, simple extruded pipe, rough wood posts, or providing nothing but the moon and the stars. In the Rural-to-Urban Transect, this declension has been systematized into six Transect Zones, each having a distinct character.

Beyond being a system of classification (of description), the Transect is an instrument of design (of prescription). The correlation of the various specialized components on a common rural-to-urban continuum provides the basis for a system of zoning that creates complex, contextually appropriate human environments.

There are benefits to such an integrated system of zoning. First, it eradicates the self-referential prescriptions of specialists. Second, each Transect Zone is an immersive environment, a place where all the component elements reinforce each other to create and intensify the character of a specific place. Several such immersive environments within a single neighborhood would attract social diversity, in contrast to the vast homogenous tracts guaranteed by conventional zoning.

The most important contribution of the Transect as an underlying theory may be to implementation. Experience shows that New Urbanist projects are technically difficult to permit. The codes and standards now in place of conventional suburban development, despite their appearance of objectivity, recognize only the conventional monocultures of zoning. Introducing a complex community into such a system is akin to running a new computer application on an incompatible operating system, requiring great effort to create an interface that is destined to never run optimally anyway.

The current dominant theory does not process authentic urbanism. An alternative, based on the Transect, would. The Transect should be neither imposed nor protected, but confirmed through empirical success. With time and the contributions of many representatives of the specialties, it could become as comprehensive as the current standard, as convenient to implement, and it would result in better places to live.

A note on the use of terms: Readers will find varying capitalization of the term "transect" throughout the book. The editors hoped to reduce confusion by using a convention that, when not capitalized, refers to the scientific tool or to a generic application to human habitat, to distinguish it from the specific theory of human settlement known as the Rural-to-Urban Transect. Capitalized as "Transect," the term should be understood as short for that theory.

1. Another reason for the planning profession's incredulity is its refusal to acknowledge the wizard behind the curtain, particularly when the wizard was an architect. This is implausible to them today, at a time when architecture is so trivial. But we all should remember that as late as the 1920s, before the other planning profession came into existence as such, architects were the primary lords of creation.

2. Sym Van Der Ryn, the Urban Ecology Group, and Anne Whiston Spirn are not immune to the old adage, "When the only tool you have is a hammer, every problem looks like a nail." Their propositions tend to the greening of what should be paved urbanism.

3. This, despite being from a current dictionary, is obviously an archaic 18th-century interpretation. Jefferson's, "We hold these truths to be self-evident," is an allusion to natural law. Today, I suppose one would call the Transect "a hypothesis."

4. The Rural-to-Urban Transect has been tested in a score of urban planning projects by the planning firms of DPZ; HOK; Torti Gallas; Dover, Kohl; Placemakers and many others, both in greenfield and infill sites at the scale of the region and the sector. The Transect-based SmartCode includes the integration of pubic works standards as well as a GIS compatibility protocol. The Transect is compatible with other analytical tools, such as William Hillier's Space Syntax. The Center for Applied Transect Studies is coordinating the work of the various specialists interested in building a comprehensive alternate system. It has also been harnessed as an organizing system by the U.S. plan service industry.

Part One:
IMAGES

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EXPLAINING THE TRANSECT

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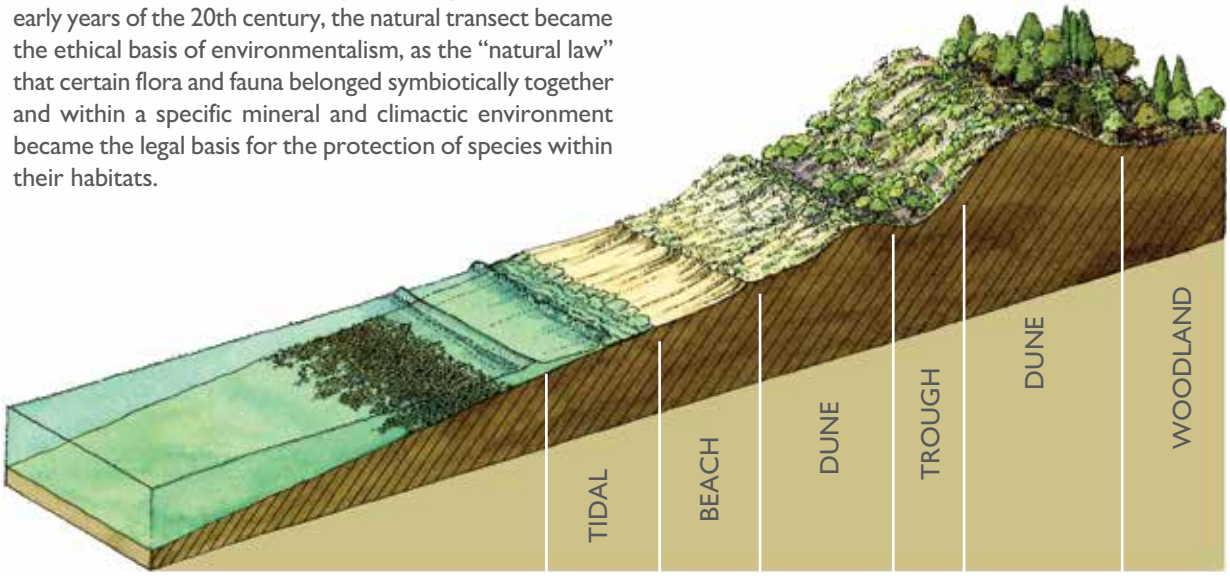
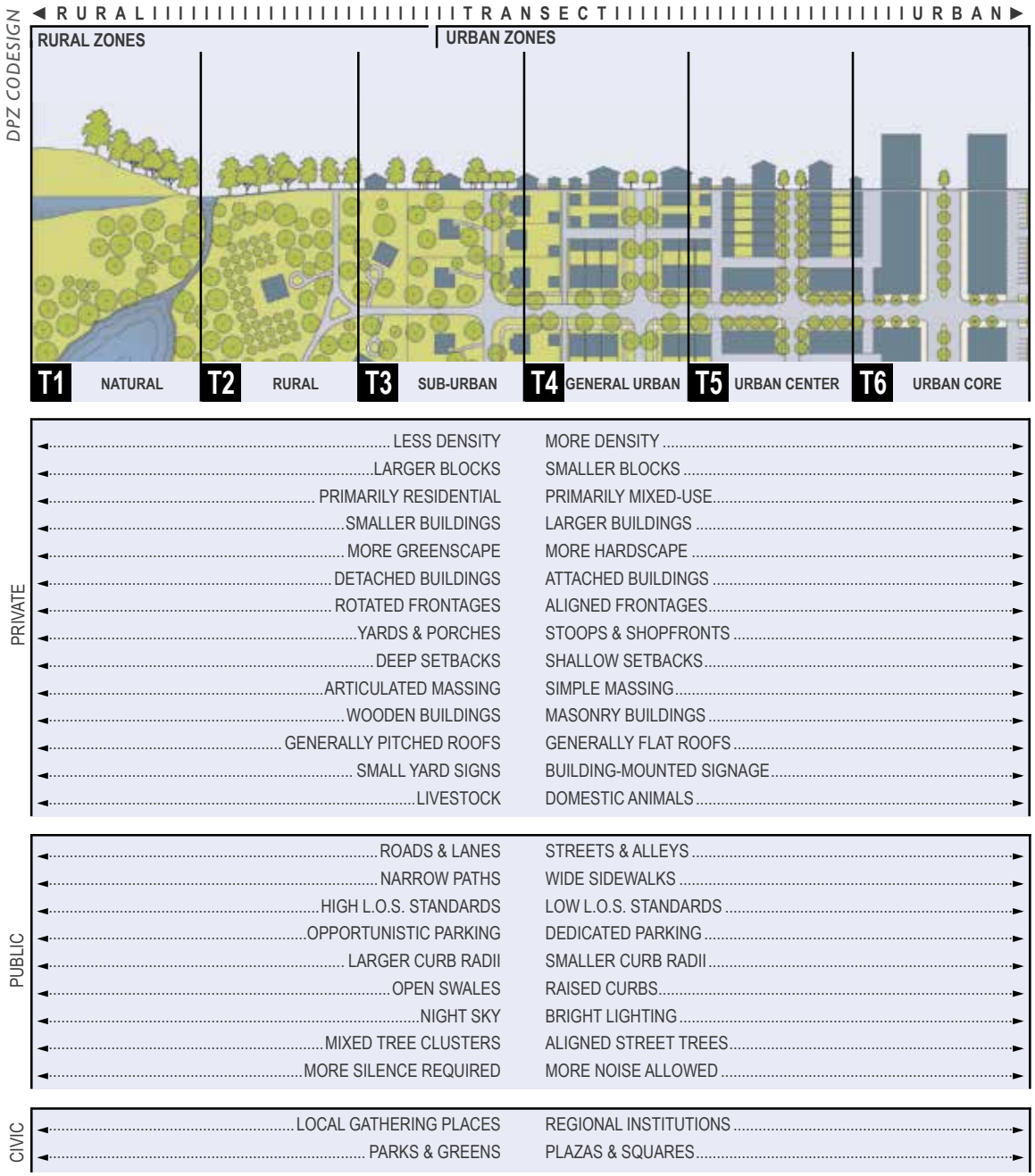
This illustration helps explain how the ecological use of the transect was adapted for use in urban design and planning, following a line across a given area and documenting the various elements found in each point along the line. In the early years of the 20th century, the natural transect became the ethical basis of environmentalism, as the "natural law" that certain flora and fauna belonged symbiotically together and within a specific mineral and climactic environment became the legal basis for the protection of species within their habitats.



EUSEBIO AZCUÉ FOR DPZ CODESIGN

MIPLACE PARTNERSHIP

Similar in framing to the purely natural transect illustrated above, is a complete natural-urban declension representing Detroit. One can see nature at both ends—the gradual feathering to farm and woodland on one side and the abrupt juxtaposition to the river on another. Between them are the typical North American urban habitats. The descriptions for this transect don't correlate in scale to the Rural-to-Urban Transect, as they mix the community scale with the finer-grained T-Zone scale.



This diagram from a SmartCode shows how virtually every physical element that comprises the natural and the cultural environment may be put into parametric order by the Rural-to-Urban Transect. This is a summary of those elements that should be calibrated for code writing. The intention of the SmartCode set of municipal regulations is the avoidance of monocultures (especially functional ones). Virtually everything is allowed everywhere, but controlled by intensity, according to the T-Zone. The module on Agrarian Urbanism is an example of the expansion of a line of this table (see page 82). The descriptions for this Transect don't correlate in scale to the SmartCode Transect, as they mix the community scale with the finer-grain T-Zone scale.

ROBERT ELVES

This aerial photo shows a regional transect of Chicago. It should not be confused with the scale at which the normative Transect is applied, which is a much finer grain. Here we can see T-1 at both the top (lake) and bottom (prairie) of the image, but the vast area in between that looks from this distance to be all T-3 Sub-Urban might contain several Transect Zones per neighborhood when viewed at a lower altitude or from the ground. In fact, there are numerous T-5 Urban Centers scattered throughout the "low" area that cannot be perceived from this distance. Similarly, the downtown Loop area that looks entirely T-6 from a distance also contains T-4, T-5 when you zoom in.

GOOGLE EARTH 2010

PIENZA

MUNICH

GOOGLE EARTH 2010

PORTLAND

MIAMI

This set demonstrates the potential of aerial photography for the analysis of Transects and for calibration. It is a conventional aerial photograph. The Transect Zones are called out by scrutiny of the photo and synoptic survey on foot. These are extractions selected for their perfect Transects. Taking one street will often provide the classic Transect section, including all T-Zones. Forty blocks is vast enough that the sample strips for each would also include other Transect Zones in a traditional city like Portland. For example, the T-3 area undoubtedly includes some T-4 and T-5. The full Transect of Portland may be experienced in the length of forty blocks shown. Espanola Way on Miami Beach displays all the Transect Zones within a walk of eight blocks.

POUNDBURY

WASHINGTON

GOOGLE EARTH 2010

NEW YORK

ATLANTA

BATH

ROME

These six urban patterns involve only two mosaics of T-Zones—in radical juxtaposition. Poundbury shows a neo-medieval hard edge to the rural—very much a European conception of urbanism within the landscape. New York City shows the obverse: Central Park places the landscape within the city—and has an equally hard edge. Washington, adjacent to Rock Creek Park, is like New York in that the intensity of the urban T-Zones increases approaching the landscape—reflecting the increase in real estate value of the long, green views. Peachtree Street in Atlanta is a declension from most- to least-dense. The intensity of the declension from T-6 to T-3 and T-2 within three blocks is remarkable! These six instances serve to correct a misunderstanding of the explanatory Transect diagram, which is drawn as a declension. The juxtaposition of non-contiguous Transect Zones exemplifies a "mosaic" or a set of "patches" that correspond with the actual urban fabric of most cities.

JORGE PLANAS DPZ CODESIGN

T-1 and T-2

T-2 and T-3

T-3 and T-4

T-4, T-5 and T-6

These fences provide a fine-tuned declension of the Transect discipline at the smallest operational scale. This is an example of just one architectural element, combining a concern for the material, its finish, and its form. They are from the 1920–1930 reconstruction of Williamsburg, Virginia. Since Williamsburg is a lineal "roadtown," the rural edge and the urban main street are within three blocks of each other. These fences thus are found within a very short distance. They provide a lesson in immersive character. Note the syntax: 1. rough-hewn cattle pickets, 2. rough-hewn zig-zag (without joinery), 3. same with joinery, 4. milled but unpainted boards, 5. painted and elaborated boards, 6. turned and dove-tailed lumber, 7. unpainted brick, and 8. painted brick surmounted by wrought iron. Each of these languages is appropriate to its Transect Zone techniques, and if allocated to the wrong one would instantly become kitsch. (Also see the diagrams on page 70.)

DPZ CODESIGN

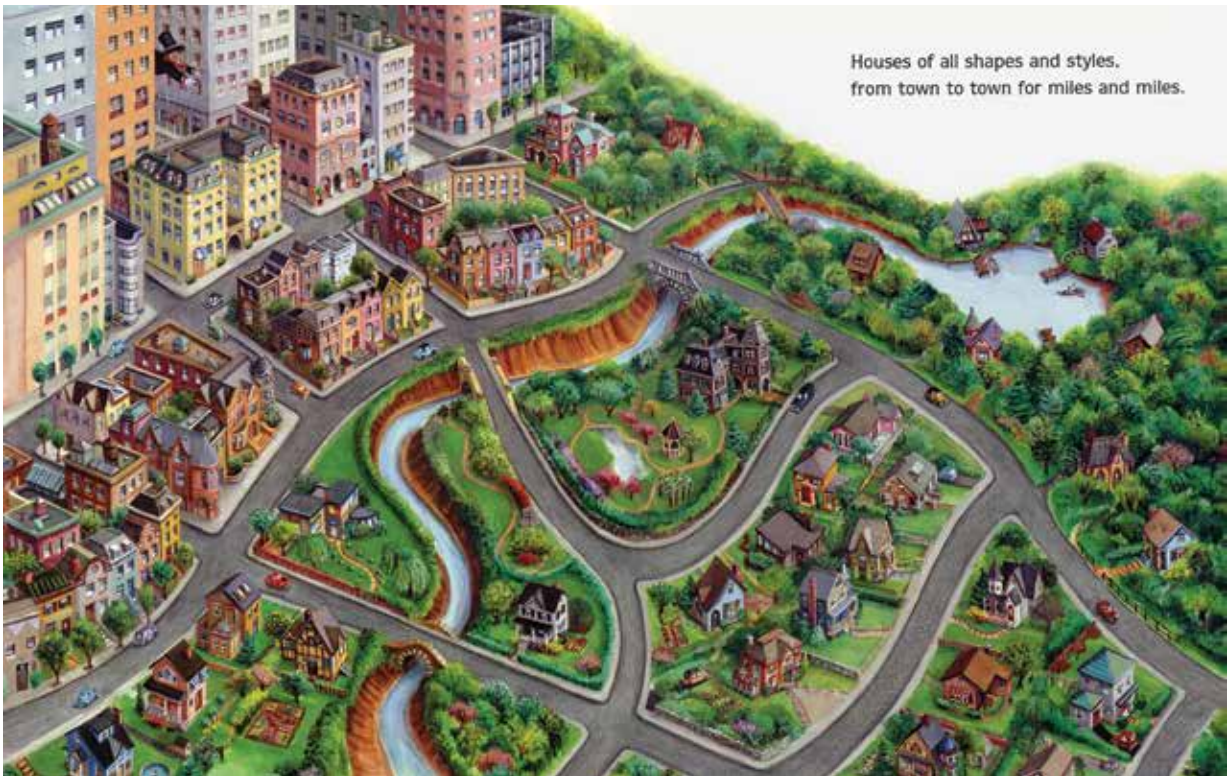
As an omnivorous taxonomic engine, the Transect not only reconciles the elements of the natural and urban habitats, but it can process all sorts of items, even those as personal and varied as pop culture and clothing. The irreverent Senen Antonio, a partner at DPZ CoDESIGN, created the set above in the early 2000s, when Paris Hilton and Brad Pitt were iconic fashion plates, plotting their outfits according to the Transect Zones. The exercise seems humorous, but it depicts the concept of the Transect in such a way that non-professionals can grasp it. Take, for example, Paris in a bathing suit, appropriate as it is in a T-1 Natural Zone (such as a beach), and then imagine her wearing that in a T-5 Center. Such a wardrobe choice would be out of place. Her T-2 Rural outfit belongs on a farm, and her T-3 Sub-Urban attire might fit on a tennis court. Her translucent dress was surely photographed at a nightclub in T-6. That dress in T-2 would be as inappropriate as overalls and a pitchfork would be at the nightclub.

Even items as specific as footwear can be plotted along the Transect. In Sarasota, Florida, a middle-aged man was asked to pull the shoes out of his closet and place them in the rural-to-urban declension, to demonstrate the Transect's taxonomic power. In only a minute the shoes were placed in a row that everyone present agreed was a clear example. This demonstration was as convincing as a lecture to the skeptics present.

JONO MILLER'S SHOES

DPZ CODESIGN

Continuing the use of cultural touchstones to explain the concept of the Transect, an unknown party took the normative Transect diagram, isolated each T-Zone, and added activities and fashion to explain how each immersive habitat compares to the others.



KEITH DUQUETTE, *THE HOUSE BOOK*

DPZ CODESIGN

Apart from the technical aspects that are described throughout these illustrations, there is something about the Transect that can be understood instinctively. The illustration above appears in *The House Book*, written for children by Keith DuQuette. Another children's story that explains the concept is Aesop's fable, "The Town Mouse and the Country Mouse."

To the left is a candid shot of Lyla Khoury, having just sketched a Transect. This is quite an advancement over the usual childhood drawing of a house with door, a window, and a pitched roof with a chimney. SmartCode pioneer Laura Hall once observed in a classroom that when boys were given toys to build a neighborhood, the boys built single towers and monsters, and the girls assembled houses, streets, and blocks.