


patch of open space cannot do it all for any given community, unless it is not only large but also uniquely situated. So we need creativity in putting together open-space systems that, like intricate puzzles, create a whole that is greater than its parts. In her critique of standard approaches, Holtz-Kay writes, “Forgotten is the fact that defined space, visionary space—not ‘open space’—makes the pulse race and the place pulse.”<sup>113</sup> To create these visionary spaces, designers and planners need to be very specific about what open space means, how local residents value it, and how it is connected into functional networks for city regions.

---

## Learning from City Stories: Ten Case Study Comparisons

The city is a fact in nature, like a cave, a run of mackerel or an ant-heap. But it is also a conscious work of art, and it holds within its communal framework many simpler and more personal forms of art. Mind takes form in the city; and in turn, urban forms condition mind.

—Lewis Mumford<sup>1</sup>

 We learn from the stories of places. They reveal patterns and processes that are useful not only for understanding one place but for anticipating what might be experienced and accomplished elsewhere. Chapter 1 explained that open-space connectivity is worth pursuing at metropolitan scales and that, indeed, many places are attempting to fit open spaces into larger patterns that achieve environmental and social goals. Ten cities in North America have grappled with open-space connectivity in assorted ways and for diverse purposes. While each story is unique, there are themes that cut across the cities and inform efforts in other places.

### Ten City Open-Space Stories

The ten case studies of Canadian and U.S. cities in the Part II portfolio, mapped in Figure 2.1, are central to this volume:



Fig. 2.1 Map of ten case study cities in Canada and the United States.

- Toronto, Ontario
- Calgary, Alberta
- Vancouver, British Columbia
- Ottawa, Ontario
- Chicago, Illinois
- Denver, Colorado
- Portland, Oregon
- Minneapolis–St. Paul, Minnesota
- Cleveland, Ohio
- Milwaukee, Wisconsin

This list of ten is, of course, not an exhaustive inventory of the cities planning and implementing innovative open-space networks at the metropolitan scale in North America. Dozens of cities qualify. I do not claim that these are necessarily the most successful examples; indeed, the measures of success vary widely. Rather, these cities shed light on many of the challenges and opportunities faced in a wide range of settings.

The cities chosen in this study are located in the northern United States (with Denver the farthest south) and southern Canada. From the former Rust Belt to the Rocky Mountain Front to the Pacific coast, they all have unique open-space stories to tell, sometimes revealing successes of implemented networks and in other cases exhibiting great potential that is just now coalescing toward regional open-space visions. Some of these places are renowned examples of greenway system design, such as Portland and Denver. Others are well-known for their stellar park systems but not necessarily for the connections among them—the Twin Cities, Milwaukee, and Cleveland.

The ten cities have the following factors in common regarding connected open space:

- *Network or system.* They have incorporated a web of linear open spaces, often along rivers and streams, but along other natural and human-built corridors as well.
- *Regional scale and multijurisdictional scope.* The networks encompass multiple political jurisdictions (e.g., counties), rather than existing wholly within one town or county (with exceptions of some Canadian cities with very large urban and rural areas within one jurisdiction).
- *Multiple functions and objectives.* The networks have been planned for multiple purposes, such as ecological soundness, alternative transportation, or recreational amenity. Although each city is used to illustrate one function primarily, all of them have diverse goals that include both competing and compatible objectives.
- *Implementation.* These case study regions have begun the implementation phase, at least in part, and have passed beyond the planning stage.

Why use the metropolitan region as a unit of analysis? Existing greenway literature primarily uses the river corridor, neighborhood, or municipality as a unit of analysis for connectivity. The creation of individual corridors is well documented. Moving the scale of concern up to a systems level has advantages for visualizing a bigger picture. A number of urban scholars have argued that the city must be addressed in its regional context, that “urban form is an expression of the natural and cultural history of a region.”<sup>2</sup> Frederick Steiner writes, “A regional view can enable cities to cope with change. Imagine living in

New York City in the mid-nineteenth century, or Chicago early in the twentieth, or Los Angeles in the middle of the twentieth . . . None of these great cities stood alone; each depended on a larger region for water, food, and other vital supplies. These regional cities prospered when that connection was reinforced. They floundered during times when those essential ties weakened.”<sup>3</sup>

Comparing spatial planning in one nation with those of another helps us understand change processes that are simultaneously global in importance and local in context.<sup>4</sup> Examining four Canadian and six U.S. cities reveals political, cultural, and environmental differences that impact open-space connectivity within cities of the two nations. Canadian and U.S. cities share many approaches to urban planning and design, yet both subtle and overt distinctions come into play and provide instructive lessons. Several Canadian cities have developed impressive greenway networks with creative combinations of local and regional coordination. Conversely, U.S. experiences in open-space planning have great relevance to Canadian planners, since political and economic conditions are similar and U.S. planners have advanced greenway design dramatically over the last twenty years.

Cities are paired in Chapters 3–7, using case study comparisons to help answer questions about how open-space connectivity is accomplished. The ten metropolitan areas have some key aspects in common, as well as some relevant differences. Like most cities built at the confluence of rich water and terrestrial ecosystems, they have important natural assets. For instance, they are all located on water bodies—rivers, the Great Lakes, or the Pacific Ocean. Populations in the core cities range from around 300,000 to nearly 3 million; however, the Metropolitan Statistical Areas (Census Population Areas in Canada) are much larger, from 1 million to 3 million in most cities, with Toronto and Chicago representing very large metropolitan regions of 5 million to 9 million (Table 2.1).

The number of local jurisdictions operating within the urban regions directly affects the connected open space. These jurisdictions are primarily cities, towns, and counties in the United States (although park boards and other special districts are also involved). For Canada, counties are not generally a pertinent level of government in urban areas. Calgary is an example of a Canadian unicity approach, where land is annexed into the city at its edges as the city expands. Only one municipality is relevant for open-space planning in the developed areas of both Calgary and Ottawa. At the other end of the spectrum, Chicago open spaces are overseen by a complex array of municipalities, park districts, and forest reserves, with over 260 units involved. In fact, Chicago has the largest number of separate jurisdictions of any city on the continent involved in open-space planning. In addition to the wide range of local municipalities involved in these metropolitan areas, the

| City–Metro region    | Population (2000) city | Population metro region | Land Area          | Counties in metro region | Major water body(ies)           |
|----------------------|------------------------|-------------------------|--------------------|--------------------------|---------------------------------|
| Vancouver            | 545,671                | 1,986,965 (CMA)         | 1,112 sq mi        | N/A                      | Strait of Georgia Pacific Ocean |
| Ottawa               | 774,072                | 1,063,664 (CMA)         | 2,796 sq mi        | N/A                      | Ottawa and Rideau Rivers        |
| Milwaukee            | 596,974                | 1,500,741 (MSA)         | 1,460 sq mi (PMSA) | 4 (MSA)                  | Lake Michigan                   |
| Toronto              | 2,481,494              | 4,682,897 (CMA)         | 2,279 sq mi        | N/A                      | Lake Ontario                    |
| Calgary              | 878,866                | 951,395 (CMA)           | 1,963 sq mi        | N/A                      | Bow River                       |
| Minneapolis–St. Paul | 382,618–287,151        | 2,968,806 (MSA)         | 6,063 sq mi (MSA)  | 13 (MSA)                 | Mississippi River               |
| Cleveland            | 478,403                | 2,148,143 (MSA)         | 2,707 sq mi (PMSA) | 5 (MSA)                  | Lake Erie and Cuyahoga River    |
| Denver               | 554,636                | 2,179,240 (MSA)         | 3,761 sq mi (PMSA) | 10 (MSA)                 | Platte River                    |
| Portland             | 529,121                | 1,927,881 (MSA)         | 5,028 sq mi (PMSA) | 7 (MSA)                  | Willamette River                |
| Chicago              | 2,896,016              | 9,098,316 (MSA)         | 5,062 sq mi (PMSA) | 14 (MSA)                 | Lake Michigan and Chicago River |

CMA=Census Metropolitan Area (Canada)

CMSA=Consolidated Metropolitan Statistical Area (U.S.)

MSA=Metropolitan Statistical Area (U.S.)

PMSA=Primary Metropolitan Statistical Area

Table 2.1 Population, land area, local units of government, and major water bodies among ten case study cities.



U.S. cities span from three to thirteen counties, sometimes crossing functionally across state lines, as in Chicago, the Twin Cities, and Portland.

### Comparative Case Studies

Case studies are the heart of this book. By documenting and comparing different cities, we can see the most successful approaches to protecting open space. Additionally, case studies reveal how open-space planning works in real-life contexts. Mark Francis defines the case study, particularly applied to design and planning, as “a well-documented and systematic examination of the process, decision-making and outcomes of a project that is undertaken for the purpose of informing future practice, policy, theory and/or education.”<sup>5</sup> Case studies are particularly effective when “how” or “why” questions are posed.<sup>6</sup>

Open-space planning and implementation are highly complex. Case studies can reveal themes, explain intricate dynamics, and answer questions about how and why things happen as they do in city regions. Case studies are also useful for turning anecdotes and generalizations into concrete documentation, bringing to light successful projects that can be replicated elsewhere.<sup>7</sup> The case studies presented in this book are meant both to describe and to evaluate how open-space connectivity is accomplished in selected places, thereby drawing out generalizable themes.

Looking *across* these cases is as important as looking *within* them. According to Francis, “it is often in the looking across multiple case studies with an eye toward synthesis and patterns rather than the individual case study that common themes and principles can be identified.”<sup>8</sup>

Following established methodological techniques for qualitative research, a set of data collection sources was used to develop in-depth cases.<sup>9</sup> These included the use of secondary sources such as historic documents, planning reports, and legal material. Research visits were made to each city, in order to conduct interviews, access historical resources, and tour open-space corridors. Spatial data were also consulted, in order to understand the location and pattern of both planned and implemented open-space landscapes.

Key informant interviews were an important source of evidence, revealing vital information on the main research questions. In selecting interviewees, referrals were sought from people knowledgeable about open-space planning, both at national and international levels and at specific case study sites. Between five and fifteen interviews were conducted in each city. Interviewees were project managers working on open-space planning within public agencies, citizens’ groups, or nonprofit organizations. For the validity of findings,

multiple sources of evidence were used, a chain of evidence was established, and key informants were asked to review drafts of the case study reports. The identities of informants are not used in the book.

### Research Questions and Hypotheses

This work is not simply about open-space planning; rather, it focuses on the *outcomes* of open-space planning. How and why are greenways and other connected open spaces implemented, beyond the planning stages? Figure 2.2 depicts a simplified image of how greenways come into being. The diagram emphasizes diverse actors and objectives. Specifically, it shows the relationships among objectives that motivate open-space networks, the organizations involved, and the subsequent purposes served. In other words, it asks not only the prototypical questions of how and why, but also the questions of who, where, and when. The questions are naturally interrelated. History (*when*) affects contemporary participants (*who*), which in turn impacts motives (*why*), programs (*how*), and spatial form (*where*). The outline of research questions, below, is reflected in the structure of each case study chapter in Part II.

### Historic Precedent and Spatial Form

What is the history of city form that has affected the reality and potential of connected open space, particularly as that history impacts the way connectivity is now being addressed? For each city, the history of open-space planning is briefly explored and the physical change in connectivity is assessed over time. The tangible outcomes of open-space planning and implementation take shape in diverse ways, typically in bits and pieces through time and space. What is the physical outcome? Some cities focus their efforts on linear greenways, whereas others are retrofitting parkways, greenbelts, and other landscapes. One hypothesis is that where a connected open pattern is already nearly intact, due to enlightened planning many decades ago, it may be possible to retrofit that pattern to accomplish new needs, whether for water quality protection, nonmotorized transportation, or other benefits. For some places, ingrained landscape structures exist on which to design functional open-space corridors, such as along abandoned railroad lines, historic boulevards, or industrial waterfronts.

The ten cities of this study contain rich narratives about the evolution of urban form. All ten were incorporated in the mid- to late-nineteenth century, with Cleveland and Chicago, the older U.S. midwestern cities, at one end of a timeline and Vancouver and

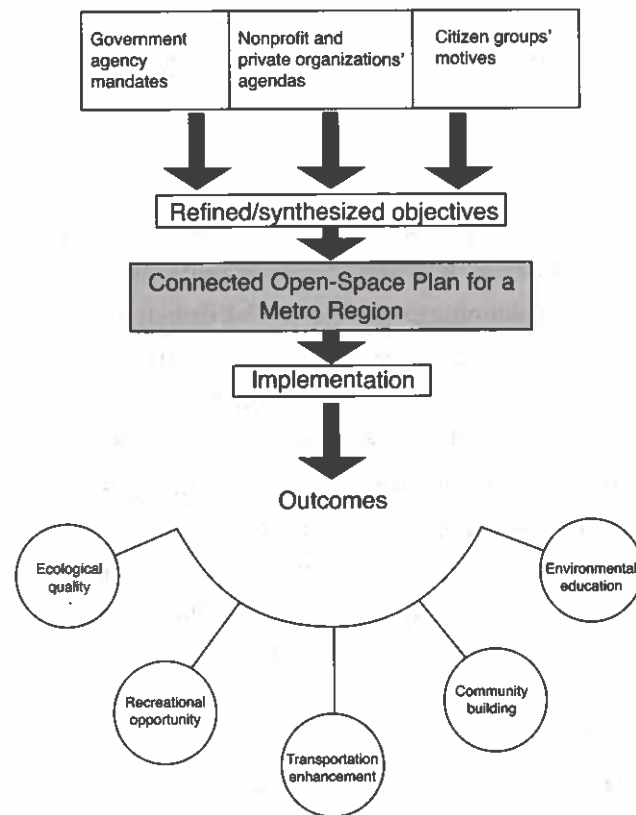


Fig. 2.2 Simplified model showing multiple agencies and organizations involved in greenway planning, working toward unified objectives, and producing a connected open-space plan. Once the plan is implemented, a variety of outcomes are usually expected.

Calgary, the newer western Canadian examples, at the other end. During an important period of progressive planning efforts early in the twentieth century, new park commissions were active in Milwaukee, Minneapolis, Cleveland, and Chicago. Particular individuals influenced many of these cities, directly shaping the urban framework and creating open-space patterns that are visible and useful today. Some of them were public officials whose impacts were profound—Charles Whitnall in Milwaukee, Theodore Wirth in Minneapolis, or Robert Speer in Denver. Others were consultants whose names are ubiquitous in the history of city planning and landscape architecture—the offices of Frederick Law Olmsted Sr., Horace Cleveland, Harland Bartholomew, and Daniel Burnham.

### *Institutional Structures and Collaborative Ties*

Institutional structure refers to the relevant agencies, organizations, and citizens' groups and their system of interaction. Achieving an open-space network necessitates an effective institutional structure, including strong leadership and intergovernmental cooperation. These factors have been important in cities across North America. In structuring this study, I hypothesized that visionary thinking is critical, along with the leadership and cooperative structure to carry out the vision. The cities that have achieved open-space networks across metropolitan areas have been guided by strong resolve about the benefits of green-space and its contribution toward community health.

Given the complex, large-scale nature of greenways, greenbelts, and other open-space systems, they are planned and implemented by a wide array of public and private organizations. Although grassroots effort has been the hallmark of the greenways movement, achieving connected open space beyond the individual corridor and at the scale of metropolitan regions takes both top-down and bottom-up work. Indeed, the multitude of government agencies, nonprofit groups, and corporations is sometimes staggering, particularly in cities as large as Toronto or Chicago. Table 2.2 summarizes the historic and contemporary open-space plans that are discussed in more detail in Chapters 3–7. The ten cities, incorporated between 1834 and 1893, have been strongly influenced by historic open-space plans, most from the early twentieth century. Early in the twenty-first, most of these cities are working from open-space plans completed in the 1990s by a range of public and private organizations.

How are these entities organized? Who are the participants and their agendas? What is the role of leadership and intergovernmental collaboration? To reveal these issues, key informants were asked a series of questions:

- What levels of government are involved in open-space planning?
- What level has primary responsibility? What level provides funding?
- Who has taken an important leadership role?
- What government agencies are involved?
- Has agency influence changed over time? Are agencies that traditionally did not consider open-space connectivity now integrating it in their agendas?
- What is the facilitative role of government?
- What is the nature of transjurisdictional cooperation?

Government agencies are critical facilitators in developing greenway networks. However,

| City/Metro region    | Incorporated | Influential historic open-space plans  | Primary contemporary metropolitan open-space plan   |
|----------------------|--------------|--|---|
| Vancouver            | 1886         | Harland Bartholomew Plan (1928)  | Vancouver Greenways and Public Ways Plan (1992) and GVRD  |
| Ottawa               | 1855         | Holt Report (1915)<br>Jacques Gréber's Plan for the National Capital (1950)                              | No unified open-space plan at the metropolitan scale  |
| Milwaukee            | 1846         | Charles Whitnall's Milwaukee County Master Plan (1923)   | No unified open-space plan at the metropolitan scale  |
| Toronto              | 1834         | Toronto Harbour Commissioner's Plan (1912); first to recommend protecting waterfront land for public use | <i>Regeneration</i> —Royal Commission on the Future of the Toronto Waterfront (1991)  |
| Calgary              | 1893         | None that address large-scale open-space planning  | Urban Parks Master Plan (1994)  |
| Minneapolis–St. Paul | 1867/1854    | Horace W. S. Cleveland plan for the Grand Rounds (1883)  | Department of Natural Resources <i>Metropolitan Greenprint</i>  |
| Cleveland            | 1836         | Cleveland Metroparks (1917)  | No unified open-space plan at the metropolitan scale  |
| Denver               | 1861         | Mayor Robert W. Speer's open-space plans (1907–1918)   | Northeast Greenway Corridor (2004)  |
| Portland             | 1851         | Frederick Law Olmsted's Parks Plan for City of Portland (1903)   | <i>Metro's Greenspaces Master Plan</i>  |
| Chicago              | 1837         | Daniel Burnham's Plan of Chicago (1909), commissioned by the Commercial Club of Chicago                  | <i>Northeastern Illinois Regional Greenways Plan</i> : Northeastern Illinois Planning Commission and Openlands Project (1992) |

Table 2.2 Dates of city incorporation, influential historic open-space plans, and contemporary metropolitan open-space plans for ten case study cities.

an important variable in greenway implementation is the level of government involvement and the nature of transjurisdictional cooperation. The primary local, regional, and state / provincial organizations involved in open-space planning for the ten cities are shown in Table 2.3. A complete list of participating agencies and organizations would be unwieldy; those shown here are the primary planners and implementers. All ten cities have active participation by local jurisdictions; however, the extent of regional government influence is less pronounced, with only three metropolitan areas—Vancouver, Minneapolis–St. Paul, and Portland—having influential regional governance. Other cities, like Milwaukee, have input from regional council-of-government organizations that have little or no regulatory power. Toronto's Conservation Authority has the ability to own and manage land, but lacks broader regulatory power. Likewise, the influence of state and provincial agencies is mixed, with the U.S. states being far more involved in open-space planning, funding, and acquisition than their provincial counterparts. Nonprofit organizations generally play more central roles in U.S. open-space planning than they do in Canadian cities. Part III synthesizes the structure of these institutional configurations, suggesting different models and predicting their usefulness to other cities.

The extent and nature of collaboration among public and private open-space planners, advocates, and citizens varies. In order to expand connected open-space networks effectively, it is critical to learn what partnerships and coalitions are operating. Increasingly, public–private partnerships are making these projects viable—boosting the enthusiasm, visibility, and funding that move efforts from *plan* to *land*. These partnerships vary in composition, scope, and longevity. In order to assess the roles of both public and private entities, interviewees were asked these questions:

- What private partners exist for this project?
- How do public and private groups collaborate?
- What is the role of open-space advocates, neighborhood groups, and citizens?
- Are nonprofit environmental organizations an important aspect of the project's success? In what way?

#### *Drivers of Connectivity: Motives, Intents, and Goals*

In many metropolitan areas, the open-space corridor concept is stretched tight between two main drivers—ecological quality and social amenity. In plan after plan, a list of benefits and objectives is laid out, from environmental education to water quality to human health. Cities are



| City/Metro region    | Local jurisdictions  | Regional government                              | State/provincial or federal agencies   |
|----------------------|--|--|--|
| Vancouver            | City of Vancouver and 20 other local municipalities  | Greater Vancouver Regional District              | N/A  |
| Ottawa               | City of Ottawa (functions as a regional government due to its size and mix of land uses)       | N/A  | National Capital Commission  |
| Milwaukee            | Milwaukee County and other surrounding municipalities and counties                             | Southeast Wisconsin Regional Planning Commission | State of Wisconsin Department of Natural Resources                             |
| Toronto              | City of Toronto (functions as a regional government due to its size and mix of land uses)      | Toronto and Region Conservation Authority        | Province of Ontario, Waterfront Regeneration Trust (quasi-public organization) |
| Calgary              | City of Calgary  | N/A  | Province of Alberta  |
| Minneapolis-St. Paul | City of Minneapolis, City of St. Paul, and other counties and cities                           | Metro Council                                    | Minnesota Department of Natural Resources                                      |
| Cleveland            | City of Cleveland and Surrounding jurisdictions, Cleveland Metroparks Cuyahoga County Planning |  |  |

| City/Metro region | Local jurisdictions  | Regional government   | State/provincial or federal agencies     |
|-------------------|--|---|--|
| Denver            | City of Denver and surrounding local cities and counties   | Denver Regional Council of Governments  | State of Colorado                        |
| Portland          | City of Portland and surrounding municipalities and counties in Oregon and Washington            | Metro   | N/A                                      |
| Chicago           | City of Chicago dozens of other cities and counties, County Forest Preserves, and Park Districts | Chicago Area Transportation Study, North-eastern Illinois Planning Commission | Illinois Department of Natural Resources |

Table 2.3 Primary agencies and organizations directly involved in connected open-space planning across ten case study regions. This table does not include non-profit organizations, which are prominent open-space advocates and leaders in many metropolitan areas.

just now sorting out the complexity of creating linkages on the physical landscape and at the same time satisfying these multiple (and often competing) demands. This is a complex endeavor.

What motives are really moving agencies and organizations to seek connectivity across the urban landscape? Is it environmental integrity or some other social, political, or economic goal? In fact, it is nearly always a combination. And sometimes one objective, like recreation, needs to be prominent in order to gain widespread support for tackling another issue, such as environmental health. So, given that the motives are compound, how are the interacting, and sometimes competing, motivations over open-space connectivity being worked out in contemporary projects? To find the answers, we asked interviewees the following questions:

- What are the main objectives driving the open-space connectivity efforts?
- What is the big vision and how was it formulated?
- Have objectives changed over time?

- How are competing goals or objectives reconciled?
- What are the issues that most constrain innovation and creativity?
- Is the green infrastructure concept being used as an ultimate objective?

Complex city regions often have objectives distinct among the different scales of planning. Local jurisdictions seek to serve residents' requirements for housing, education, recreation, and other needs. This differs somewhat from regional entities, which address large landscape-level problems—environment, transportation, and economic development. Therefore, it is likely that the open-space planning and implementation being accomplished at different scales will vary and that objectives will mismatch, if not collide. A follow-on question then: How are these varying motivations leading toward or away from coordinated efforts in connected open space?

Another prediction is that the goals for open-space projects in general, and connected ones in particular, are changing. These projects, in order to be funded, supported, and implemented, often need to multitask. Whereas in the past, recreation or transportation could be a dominant intention for these projects, recent efforts are much more complicated. For instance, nonmotorized transportation was the heart of funding for greenway projects, largely through federal transportation funding, in the United States throughout the 1990s. To move toward green infrastructure planning, which many cities are attempting to do, the canvas will need to widen to incorporate issues of public health, ecological quality, and neighborhood revitalization.

Chapters 3 through 7 explicate five interrelated functional themes for connected open space: ecology, recreation, transportation, community, and green infrastructure. It is important to realize that they are not mutually exclusive, and the Part II chapters explore the interactions. Each chapter is organized around one main approach (or suite of functions) of open-space planning. For each city, however, the objectives that drive open-space programs are always more complicated, and, as shown in Chapter 1, motives are nested. Indeed, this complexity is explored in each chapter using real places and their actual opportunities and constraints.

These chapters are ordered to create a structural design that builds from the broad to the more specific and back again. In other words, ecology is used in Chapter 3 as a foundation for all other open-space connectivity goals. Following that, Chapters 4 through 6 explore specific cultural goals that may be overlaid onto an ecological framework. Then Chapter 7 puts these diverse objectives back together within the scaffold of green infrastructure, an emerging paradigm for thinking about urban form, sustainability, and connectivity.

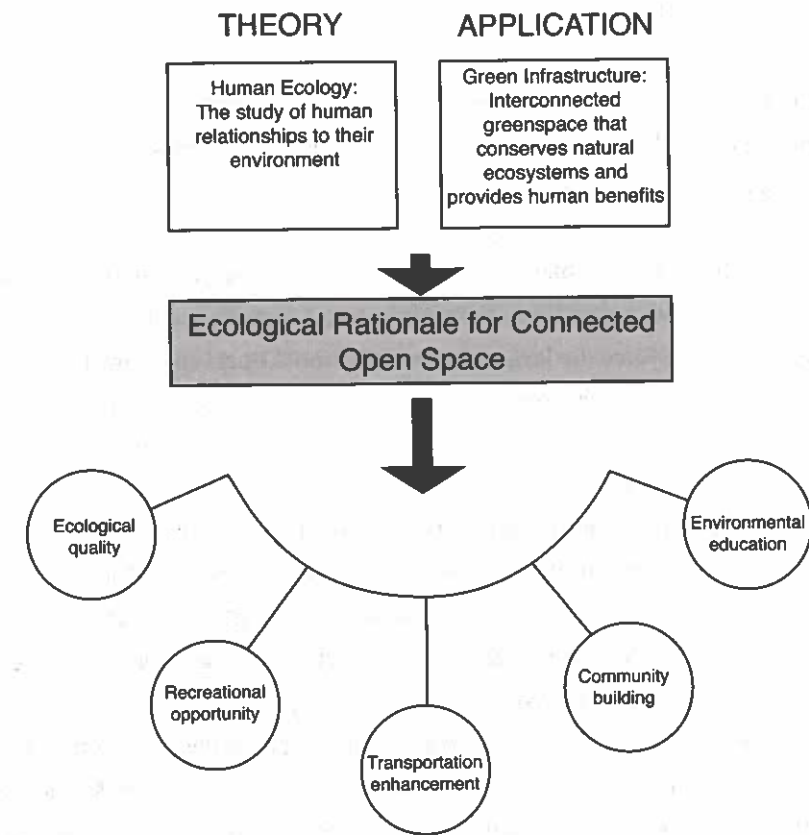


Fig. 2.3 A model of theory and application in connected open-space planning using ecology as a foundational goal.

#### ECOLOGY: HOME

Ecology is used as an umbrella context under which all other open-space motivations are clustered, as illustrated in Figure 2.3. The subtitle “home” implies the importance of human ecology and urban habitat as a wellspring from which to build networks of open land. Across the continent, cities are striving to merge issues of sustainability, biodiversity, and environmental health into many aspects of civic enterprise. Instead of thinking that people are secondary in an ecology-first agenda, human ecology shows us that people are part of ecology and that environmental quality is a prerequisite to all other human endeavors.

Chapter 3 highlights cities where an ecological agenda is crucial in connected open-space planning. Chicago and Toronto set the foundation for the other case study chapters. Their open-space planning, implementation, use, and impacts are complex and vast. Both cities have efforts devoted to watershed protection, urban greening, and protected corridors across



multiple jurisdictions. However, at the heart of much of the open-space work being done in both city regions is a profound goal of environmental protection and enhancement. Both cities have developed a diverse set of objectives for open space, and these are built on a foundation of environmental goals. Chicago and Toronto are at the forefront of ecological open-space planning for their respective nations.

These cities are also the most daunting; the sheer size of Chicago and Toronto prevents detailed examination of open-space networks. It would be an overwhelming task to catalog all of the organizations and initiatives under way regarding connected open space. Rather, this chapter explores the large multijurisdictional open-space initiatives, and the collaborations among them, that are operating across these large metropolises.

#### RECREATION: WELL-BEING

Recreation has long been one leg of the traditional three-legged stool of greenway objectives (with conservation and transportation). Concerns for human well-being, for peoples' leisure-time places, have been important since park planners began designing urban parks in the nineteenth century. Over the past decades, there has been a dramatic renewal in the health-enhancing aspects of recreation activity and the shape of places to accommodate it. It is fitting that we have come full circle on the connection of spatial design and health. One of Frederick Law Olmsted and Calvert Vaux's primary goals in designing their famous nineteenth-century urban parks was the health of city-dwellers. Over nearly four decades of design work, they addressed health, safety, and aesthetics in a range of open-space contexts.

More than a century later, environmental conditions for most of North America's city-dwellers are vastly better than in Olmsted's time. Even though dramatic basic improvements have obviously been made for most city inhabitants, we now are beginning to realize the more subtle effects of an automobile-dependent life. A new renaissance is under way, where the connection of spatial design and human health is being explored in housing, the workplace, and, indeed, all facets of the design of human settlements. An important part of this endeavor is getting people outdoors to walk, work, play, and move through open space.

In Chapter 4, Ottawa and Milwaukee are used as prototypes for cities where recreation is, or has been, a primary driver behind greenway planning. Planners who valued the recreational benefits of well-connected, environmentally healthy landscapes structured both cities earlier in the twentieth century. How has this motive stood up in recent decades, and how can it be overhauled to incorporate the myriad of other benefits that connected open space is expected to provide today? These cities show that historic frameworks for con-

nected open space, designed over a half century ago for humanistic goals, have important elements to contribute to modern open-space networks. They also show that the sometimes conflicting, sometimes compatible relationship between recreation and ecology is an unsettled one in open-space planning.

#### TRANSPORTATION: MOVEMENT

Connected open space in metropolitan areas is partly triggered by the need for people to be on the move, and is also influenced by new knowledge about healthy lifestyles. Alternative transportation, primarily cycling, has been a primary driver of networked open-space systems.

It is estimated that about 80 percent of urban open space is in the form of streets, so the transportation connection is an important one for open-space planning. The potential for transportation routes to satisfy other open-space needs is often overlooked. According to Helen Woolley, "the fact that streets impinge upon urban life as routes, locations for services, frontages to both residential and business properties and often are the boundary between public and private life is often ignored by professionals, politicians and decision makers."<sup>10</sup> And when transportation is the focus—for example, in cycling routes—the implementation of long-distance greenways and parkways has entailed pragmatic getting-from-here-to-there goals, rather than incorporating any sense of environmental soundness. Bike trails and bikeways abound in our urban settings. Do they qualify as connected open space? Do they provide the other benefits that accrue to green corridors designed for multiple purposes?

In many cases, the answer is yes. The provision of corridors for walking and cycling reduces the use of automobiles, having direct environmental benefits aside from the important health effects. In some cases bikeways are routed in ways that provide a range of other open-space amenities. However, the transportation motive probably conflicts with environmental goals more than any other pairing.

In Chapter 5, Calgary and Denver, cities situated within wide-open spaces and covering great land areas, are used to illustrate how nonmotorized transportation is achieved through greenway planning and implementation. Both cities are excellent models for successfully integrating pathways and trails into the urban fabric even though their environments are often not green and their climates are harsh. They differ in institutional structure, urban history, and open-space leadership, but the corridor outcomes in both cities have a similarly high level of support, use, and popularity.

## COMMUNITY: NEIGHBORHOOD AND SOCIETY

A basic tenet of human ecology is the concept of community. Open spaces in built environments reflect their community settings through design, management, location, and use. Landscape architects and other designers have shown that a sense of community can be fostered through manipulating spatial environments. The neighborhood community garden is an often-used example, as are the promenades, plazas, and other gathering areas that bring people together and encourage interaction. Community gardens speak volumes about neighborhood pride. They provide one context where the public realm provides space for social interaction to be played out.

Open spaces are increasingly used as community-building tools. For some cities, the benefits of neighborhood revitalization, citizen empowerment, and community health are foremost in thoughts about landscape connectivity. Open-space connections can be empowering neighborhood elements, as depicted in Vancouver's neighborhood greenway program. In Chapter 6, Vancouver and Portland exemplify efforts at building neighborhood identity, illustrating city history, and mobilizing citizens' efforts through greenway design and implementation.

## GREEN INFRASTRUCTURE: CITY FUNCTION AND THE SHAPE OF GROWTH

Cleveland and the twin cities of Minneapolis and St. Paul are used in Chapter 7 for exploring comprehensive objectives that move open-space planning toward green infrastructure objectives. Cleveland is used as a potential test site for green infrastructure development, and the Twin Cities as a metropolitan region that is currently implementing these concepts.

Chapter 7 depicts the evolution of greenway planning toward green infrastructure planning, a shift that has its base in the merging of human well-being and environmental goals. While human ecology and landscape ecology show that this merger is logical and beneficial, it has only recently been assembled holistically in the green infrastructure idea. "It has only been in the last ten years that an urban focus for environmental concerns has emerged around 'people-centered' environmental issues such as health, environmental quality and consumer behavior issues such as energy and water and household level recycling. Now for the first time, the human built environment is the primary focus of attention. For the first time, responsibility for environmental issues falls within the professional realm of urban designers."<sup>11</sup>

On the other hand, the ideas of green infrastructure are not totally new. But they have been reframed to help us think about the gray and the green surfaces, the mundane underground

pipes, and the aboveground roads and utilities in a new way. Anne Spirn showed this nearly twenty years ago: "The pathways along which energy and materials flow through the urban ecosystem are also the routes along which pollutants disseminate and where energy is stored and expended . . . Many American cities, however, share two major problems: the deterioration of urban infrastructure, including water supply and sewage treatment systems, and the decline of inner city neighborhoods. A comprehensive view of urban nature could contribute to the restoration of both."<sup>12</sup> As Mark Benedict and Ed McMahon have argued, communities need to upgrade and expand their network of open spaces, woodlands, and other natural areas just as they do their roads, sewers, and utilities.<sup>13</sup> But beyond that, they need to integrate the two realms. The Twin Cities and Cleveland help depict how green and gray networks might be pursued not only at the same time, and with the same urgency, but also in the same place.

## Conclusion

The five case study chapters in Part II build a platform for conclusions about open-space connectivity. Part III draws out the lessons learned from examining these ten cities across the continent, considering their different histories, social fabrics, and geographies. It shows how some contemporary open-space corridors are living artifacts of early-twentieth-century urban design and planning.

In addition, the case studies provide evidence for a typology of institutional structures for connected open-space implementation, showing how different levels of government participate. Part III deals centrally with issues of leadership and vision, not only by individuals but by organizations and agencies. Another thread running through the case studies weaves together facets of collaboration, coordination, and citizen involvement. Part II provides the basis for diagramming and diagnosing, in Part III, the way governmental and nongovernmental entities interact in open-space programs, and how neighborhood and citizens' groups affect implementation.

Finally, Part III pulls together the lessons learned about motives and outcomes. The objectives for developing and protecting open-space corridors change over time. While the three-legged stool of recreation, transportation, and conservation has supported greenway efforts across the continent, it is rare that each leg is equally weighted. Furthermore, modern open-space corridors are expected to provide many other benefits—from environmental education to neighborhood enhancement to water quality protection. The new frontier lies in multiobjective projects. Natural features protection and green infrastructure planning will, like the restoration of neighborhoods and communities, be central to successful implementation strategies.