

Introduction to Special Issue Trails and Greenways: Opportunities for Planners, Managers, and Scholars

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ABSTRACT: This paper presents an overview of trails and greenways as a field of practice and study. We start with definitions of both trails and greenways and consider some of the ways that they are separate but related. Historically, trails and greenways have been important parts of human activity through exploration and settlement. A brief overview of this history is provided in the North American context. Today trail and greenway development is seeing resurgence in urban areas and there are many organizations promoting trails that connect rural and urban areas enhancing recreation and transportation opportunities. Federal policies related to surface transportation (ISTEA/TEA 21) are providing funding that is helping to spawn the resurgence. Rail "banking" policy and nonprofit organizations have combined to help convert thousands of miles of abandoned rail line into trails. Research suggests that the benefits from trail and greenway resources extend from the individual experience as it relates to personal recreation and health, to the wider community through reduced automobile traffic, enhanced visual quality, conservation of natural values, economic development and others. The papers included address many of these issues. Our purpose here is to provide a current context for the special issue on trails and greenways, to introduce the contributions of some who are doing work in this area, and provide food for thought regarding research in the trails and greenway arena.

KEYWORDS: Trails, greenways, recreation resources, research needs.

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Introduction

Before embarking on this special issue of the *Journal of Park and Recreation Administration* dedicated to trails and greenways we found ourselves asking each other and many of you the question: "Are trails and greenways really important, unique and worthy of focused research attention"? Although the particulars of the answers depended on the perspective of who was asked, the conclusion was the same. Trails and greenways are

indeed important and unique and should be carefully examined. To users, trails¹ are travel routes and settings for activities and experiences. Many users visit trails purely for recreation. Others use them more as a means to get from one place to another, perhaps trailhead to alpine lake or home to subway station. Either way, there is no doubt that trails are extremely popular settings for recreation and valuable for transportation.

To managers, on the other hand, trails are facilities. Nearly all public parks, forests and recreation areas have them and their staffs use various means to plan, build and maintain them. The maintenance and management of trails and greenways are expensive and present many complex, unique and important challenges to those charged with providing them. To communities and society as a whole, trails are a source of various benefits, e.g., health and fitness, mitigation of traffic congestion, enhancement of visual quality. To policymakers, trails and greenways represent opportunities to shape and balance many land uses and related impacts while generating these benefits. And to researchers, trails offer broad opportunities for basic and applied study. Trails provide research settings that are frequently convenient microcosms of outdoor recreation behavior. They also offer applied challenges to improve the quality of recreation opportunities and address the many issues faced by planners and managers.

The papers in this special issue present and examine trails, greenways and their uses from these various perspectives. We and the other authors contributing to this issue make the case that these resources and their uses are important, and that scholarly examination of them is essential. We also attempt to provide a scholarly perspective on trail practice and the existing literature and make suggestions for furthering trails and greenways research.

Trails and Greenways-Definitions, Background and Scope

The most obvious starting point for those interested in trails and greenways begins with the questions: "What are they?" and "How many are there?" Both of these questions are difficult to answer definitively due in part to the diversity of trails. For example, Axelson et al. (1999) identified 13 different trail types based on the activities they supported and their settings. Greenways, being a more contemporary term, is harder to define due in part to the multiple functions they serve. Planners, landscape ecologists and recreation professionals all define greenway resources relative to their particular framework and setting.

Webster's Dictionary defines a trail very simply as a "beaten path." The term greenway is less common and is difficult to find in most dictionaries. However, "greenway" does appear in some unabridged dictionaries as, "any scenic trail or route set aside for travel or recreational activities" (Flexner, 1993). This definition confuses the issue further by implying that

¹We will address more detailed definitions later in this paper. For simplicity's sake we will use the term "trail" broadly to include the spectrum of trails from primitive to high-standard multi-use trails.

a greenway is, in fact, a trail. Landscape ecologists often concern themselves with greenways that function as habitat for flora and fauna or the needed connections between habitat areas. Contrary to the above definition, many greenways would specifically exclude trails because of the potential for negative impacts due to human use (Baschek & Brown, 1995; Hellmund, 1993). Currently within recreation, transportation and conservation planning and management, the terms trail and greenway are complementary but often different in meaning. It is important to understand the similarities and differences in order to plan for, designate, develop and manage both in multiple contexts.

Trails

A task force of trail groups and government agencies defined a trail as “a linear corridor, on land or water, with protected status and public access for recreation or transportation” (*American Trails*, 1990 p.2). Axelson et al. (1999) defined trails as paths of travel for recreation and/or transportation within a park, natural environment or designated corridor, that are not classified as a highway or street. Moore and Ross (1998) have suggested that at least five broad overlapping types of trails exist in the context of parks and recreation today. (1) *Traditional backcountry trails* are those that typically have a narrower tread than other trail types, a natural tread surface and provide for multiple recreational uses in more remote parts of parks and recreation areas. (2) *Recreational greenways* are natural corridors of open-space that contain a trail. The term is sometimes used to refer to the corridor and sometimes to the actual trail within it. In either case, the greenway corridor is often in contrast to urban or suburban development adjacent to it. (3) *Multiple-use trails* could be located in any environment, but the term is most commonly used when referring to trails located in recreational greenways. They are characterized by a wider, hardened tread that is suitable for higher densities of use across multiple activities. Ryan (1993) refers to the multiple-use trail as “a modern public space” that “invites many different types of users... to share a trail corridor collectively.” (p. 5) (4) *Water trails* are also popular, offering users opportunities to paddle or motor along navigable rivers and streams. (5) *Rail-trails* are being designated at a rapid pace and are increasingly popular as recreation facilities in the United States. Such trails involve the conversion of abandoned rail lines to trails for transportation and recreation and are sometimes eligible for federal “rail banking,” which keeps the original rail corridor available for return to rail service if needed. Because of the history of water and rail transportation in the modern development of America, water- and rail-based trails often have significant historic and cultural values.

The National Recreation and Park Association (NRPA) categorizes trails as (1) those incorporated in greenways, (2) park trails, and (3) connector trails (Mertes & Hall, 1996). They define park trails in much the way that multiple-use trails have been defined but further break this type into those that exist along a waterfront, those of lighter use in subdivisions and those of minimum impact in nature reserves. NRPA also recognizes

connector trails as those used to link work and school places to parks. They indicate that such trails are often in existing right-of-ways much like a sidewalk.

These examples reveal some of the nuances in today's trail planning and management environment. The differences in form and function suggest a need to more fully understand trails based on their users, their design and their settings. Many of the types and classifications reviewed above were born of increased demand, new user groups and new policies related to trails.

Greenways

Greenways often include trails but are not one in the same. One of the most common modern definitions of a greenway is a linear open space corridor that follows a natural or human-made feature. Charles Little (1990) provided a comprehensive definition of greenways that is often used as a starting point in contemporary discussions (e.g., Flink & Searns, 1993; Hay, 1991; Walmsley, 1995). Little's definition suggests that the greenway concept is quite broad:

- (1) A linear open space established along either a natural corridor, such as a riverfront, stream valley, or ridgeline, or overland along a railroad right-of-way converted to recreational use, a canal, a scenic road, or other route.
- (2) Any natural or landscaped course for pedestrian or bicycle passage.
- (3) An open-space connector linking parks, nature reserves, cultural features, or historic sites with each other or with populated areas.
- (4) Locally, certain strips of linear parks designated as a parkway or greenbelt. (p. 1)

Little further identified five major types of greenways: (a) urban riverside greenways, (b) recreational greenways, (c) ecologically significant natural corridors, (d) scenic and historic routes, and (e) comprehensive greenway systems or networks.

Fabos (1995) suggested that greenways were "corridors of various widths, linked together in a network in much the same way as our networks of highways and railroads have been linked" (p. 5). Fabos went on to state that greenway systems represented "nature's superstructure" and identified three types: (a) ecologically significant greenways, (b) recreational greenways, and (c) heritage/cultural greenways (p. 5). Landscape ecologists have defined greenway resources more specifically, largely to convey the need for better regional connectivity (Buono, Tsihrintzis & Alvarez, 1995; Dramstad, Olsen, & Forman, 1996) and to protect habitat (e.g., Baschek & Brown, 1995; Hellmund, 1993). For example, a framework developed by Baschek and Brown (1995) suggested a classification of landscape elements along a greenway to better quantify the ecological value for use in planning and design along urban rivers.

Searns (1995) traced the history of greenways arriving at a contemporary definition of greenways as resources that achieve multiple objectives, particularly in urban areas. Shafer, Scott & Mixon (2000) have also made

the case that today's greenways can be many things including, corridors for managing stormwater, recreational areas, routes for transport, habitats for wildlife and/or as land uses conducive to certain kinds of economic development. The Conservation Fund (2001) echoes the multiple objective approach characterizing greenways as "...corridors of protected open space managed for conservation and recreation purposes. ... Some greenways are publicly owned, some are privately owned, some are the result of public/private partnerships. Some are open to the public, others are not. Some appeal to people, others attract wildlife."

Background

In North America, as in most parts of the world, trails and greenways have been and continue to be built for many reasons. Two of the primary motivations have been transportation and recreation. Native peoples built and used trails as transportation and commerce routes long before colonists arrived from Europe. Many of their historic routes became the colonists' bridle paths, stage roads, and later the paved highways still in use today.

Recreational trails have a much more recent and complex genesis. In the northeastern U.S., for example, early mountain trails were often developed out of a fascinating mix of scientific curiosity, adventure seeking, and commercial opportunism described in wonderful detail by Waterman and Waterman (1989) and others. The first well-documented mountain climb in North America occurred on Mt. Washington in New Hampshire in 1784. One of the leaders of that expedition (a minister, scientist and important early botanist named Manasseh Cutler) is credited with subsequently cutting the first mountain trail in the region—the Gibbs Path on Mt. Washington around 1809 (p. 39). The apparent purpose of that early trail was to provide access for Cutler's scientific expeditions to study the alpine vegetation and other curiosities of the high country. Soon after, mountain guides in New Hampshire began building trails to facilitate a growing tourist trade based on mountain scenery. The first such route was the Crawford path built in 1819 by Ethan Crawford to enable him to more easily guide clients (who might be called eco-tourists today) from his inn to the summit of Mount Washington (pps. 39-41).

Ironically, the trails cut by early guides in New England made it possible for less adventurous hikers to find their ways without the services of guides. In the 1850s trail construction by another innkeeper in the White Mountain's Waterville Valley created the northeast's first true trail system. The modern age of trail building began in this same range in 1876 with the formation of the Appalachian Mountain Club and the beginning of a sustained period of hiking trail construction (p. 207). The national and regional histories of trails and trail systems vary tremendously, of course. The principal forces in creating trails at different times and in different areas have been explorers, guides and outfitters, volunteers and nonprofit organizations and the spectrum of government agencies from town councils to the Civilian Conservation Corps, the USDA Forest Service and many others.

Current Scope of Resource Use

Pioneering individuals and organizations like those just noted have left us a rich and diverse collection of trails. In the United States for instance, there are now actually two distinct, but sometimes interconnected and overlapping systems of trails. The first and best known is the National Trail System (NTS), authorized by the National Trail System Act of 1968. It and later amendments created an official system of trails in the United States with four categories of routes: National Scenic Trails such as the Appalachian and Pacific Crest Trails; National Historic Trails such as the Lewis and Clark and Santa Fe Trails; National Recreation Trails; and Connecting and Side Trails. There are currently 20 National Scenic and National Historic Trails authorized that will total more than 37,000 miles when completed. There are also 822 National Recreation Trails with a combined mileage of more than 10,000 miles (Chavez, Harding & Tynon 1999). The National Trail System is extensive and impressive and will likely become even more so. It is also highly varied, including long and remote wilderness routes, multiple-use urban greenway trails, and commemorative historic trails, some of which are marked motor routes connecting trail segments with historic sites and interpretive centers on existing roadways and are not intended for hiking or riding. However, the official National Trail System was never intended to and will never meet all trail needs.

Augmenting, typically predating, and almost certainly far exceeding the mileage of the designated National Trail System, are all the other trails in the U.S. These routes include local networks of many kinds, as well as individual and sometimes isolated trails not connected to others in any type of formal system. For example, there are now nearly 1,100 rail-trails totaling over 11,000 miles (Rails-to-Trails Conservancy, 2001). Many of these trails are not yet connected to others and some may never be. Many of them are not part of the National Trail System and are developed by organizations and enthusiasts in local communities. Past director of the National Park Service's Rivers, Trails, and Conservation Assistance Division, Bill Spitzer, often characterized this kind of configuration as being "star bursts" of local trails that may or may not be connected to the designated National Trail System.

The extent of trail resources existing today is extremely difficult to gauge accurately. Inventorying the number of trails currently available and their mileage has been a daunting task for several reasons. One is the obvious diversity of trails that leads to inconsistent criteria for what should and should not be included in such inventories. Single-track backcountry trails are almost always included when agencies or trail advocates undertake inventories. Hard-surfaced urban greenway trails typically are as well. But what about backcountry roads where mountain biking or OHV use may be the dominant activities? What about the Freedom Trail in Boston, which to the casual observer is a stripe painted on existing sidewalks directing visitors to historic sites around the city? There are underwater trails and underground trails (at least one National Recreation Trail is located in a

cave). There is a recently emerging emphasis on “water trails” as well. Water trails are not included in the scope of this JPRA issue but are beginning to be included in trail inventories and plans. Another reason accurate trail inventories and mileage totals are difficult to assemble is the multi-jurisdictional nature of trail systems. They exist in the private, nonprofit and public sectors and at all levels from local, county and state, to national and even multi-national. The organizations that plan, build and maintain them are almost countless and read like a who’s who of land managers, recreation providers, land trusts and less formal clubs and individuals.

Trail and greenway use is likewise difficult to tabulate, because what are commonly thought of as “trail activities” may or may not actually occur on trails, and most large-scale studies focus on activity participation not where the activity takes place. There seems little doubt, however, that trails are extremely popular and heavily used. During 1994-95, for example, an estimated 68.3% of Americans 16 or older participated in nonmotorized “trail/street/road activities” as defined in the National Survey on Recreation and the Environment. This means that 136.9 million people in the U.S. walked, ran, jogged or biked during that period. The same study found that walking was the most popular outdoor recreation activity in the nation, with two-thirds of the population participating in the previous 12 months (Cordell et al., 1999, pp. 221-223). A 1998 study in North Carolina found that 32% of state residents had used a trail in the past 12 months, and that another 22% wanted to, but were unable for some reason (Moore et al., 1999). A similar study in South Carolina found that 33% of residents had used a pedestrian trail during the past 12 months (University of South Carolina, 1992). In Texas, 70% of statewide respondents had walked for pleasure and averaged 106 days a year in which they engaged in the activity (Goldbloom, 1992). It also appears that trail use may be increasing significantly. The number of Americans, 16 or older, participating in activities typically engaged in on trails increased dramatically between the 1982-83 and 1994-95 surveys examined by Cordell et al. (1999 p. 239). For example, the percentage of people engaged in hiking increased by 93.5% between the two surveys, the percent backpacking was up 72.7%, the percent off-road driving was up 43.8%, and the percent cross-country skiing was up 22.6%. Among activities typically engaged in on trails, only horseback riding dropped (10.1%) between the two surveys.

Benefits and Current Policies

Trails and greenways offer benefits both to those who use them and to the wider community. Personal benefits have been researched in many places and with multiple user groups. Two of the papers in this issue (Frauman & Cunningham; Bichis-Lupas & Moisey) examine personal benefits related to trail and greenway use. Exercise/fitness and appreciation of nature are often benefits that users perceive as especially important in relation to trails (East Bay Regional Park District, 1997; Goldbloom, 1992; Moore & Ross, 1998; Shafer, Lee & Turner, 2000). People commonly use

trails and greenways with family and friends and reap social benefits through the development and maintenance of relationships. Sharing trails and greenway places with neighbors and other community members who walk, ride or skate may also provide social benefits. Lee (1999) found that most encounters (80%) between users along a suburban greenway trail created positive emotional responses. An implication is that these places may help to foster positive interaction among a community of users.

Multiple objective greenways create benefits for the nonuser community as well. Like traditional parks, greenways can provide relief from visual blight in heavily urban areas. If designated at adequate widths greenway corridors may provide desirable habitats and useful migration routes for flora and fauna. The combined amenities (e.g., a stream, a trail, vegetation and linear open space) often appeal to entrepreneurs hoping to take advantage of views to enhance dining experiences, or of the trail user market for fitness gear. Crompton's paper in this issue indicates that a greenway trail near a home is often perceived by owners and realtors as advantageous to value and resale.

Policies and initiatives regarding trails and greenways have steadily increased in North America in the last 15 years. The report of the President's Commission on Americans Outdoors (1987) renewed the legitimacy of trails and greenways in communities and spoke of the need to develop such resources through citizen-driven initiatives. Like the ORRRC report of the early 1960s, this report recognized an increasing demand for outdoor recreation in the United States but recommended that access to outdoor recreation should be more available at the local level and suggested that networks of trails and greenways were viable ways of doing this. Searns (1995) has pointed out that hundreds of greenway and trail initiatives were in various stages of completion by the early 1990s.

Federal transportation policy has likely had more far-reaching implications for greenway and trail development in the past decade than any park or open-space policy. The Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 ushered in a new era of "kinder and gentler" transportation policy. This legislation made hundreds of millions of dollars available for transportation projects designed to increase the viability of bicycling and walking as modes of transport. The money has been used for everything from the purchase of greenway corridors to the development of multiple-use trail facilities. The primary stipulation has been that these facilities demonstrate a relationship to the surface transportation system. Though facilities of this type are attracting more commuters (e.g., Moritz, 2000), in many cases a majority of use has been recreational (e.g., Shafer, Lee & Turner, 2000).

ISTEA legislation also created the National Recreational Trails Grant Program that has allocated millions of dollars to trail projects that do not have to be directly linked to surface transportation. These grants encourage private-public partnerships and currently supply funds for up to 80% of a trail project. ISTEA legislation was reauthorized in 1998 as the Transpor-

tation Equity Act for the 21st Century (TEA21), helping further institutionalize the importance of trails and greenways as components of a community's infrastructure.

Those interested in the health and fitness of the nation have also been touting the value of trails and greenways as facilities that can enhance access to places for physical activity. In 1994 the Surgeon General authorized the Centers for Disease Control and Prevention (CDC) to prepare a national report on physical activity and health. The results of this report included recommendations for individuals and communities in an effort to stem a high level of inactivity linked to a number of diseases. The report suggests that one of the barriers to physical activity is lack of access to places to walk and recommends that communities provide better access to trails.

Existing Research and Future Needs

There is no shortage of written material related to trails and trail use. There is a huge public appetite for guidebooks, maps, and popular articles for trail users. Likewise there are large numbers of trail plans, considerable material on construction and maintenance techniques, and publications that address trail and greenway advocacy, planning and development, many of them quite good. The groundswell in community-based projects, prompted to an extent by initiatives and policies outlined above, has created a demand for literature that presents planning processes and design examples in a practitioner-friendly format.

Flink and Searns (1993) publication on greenway planning is often cited as a base for start-up information as is Ryan's (1993) publication, *Trails for the 21st Century* (now in its second edition by Flink, Olka & Searns, 2001). Development of these publications was largely supported by The Conservation Fund and The Rails-to-Trails Conservancy, respectively. Numerous local publications and web sites have been produced in support of trail and greenway resources. Some of these espouse regional systems of trails and greenways covering many states (e.g., New England Greenway Vision Plan, 2001) others individual states (e.g., Florida Department of Environmental Protection and Florida Greenways Coordinating Council, 1998) and still others individual cities and towns (e.g., Austin Metropolitan Trails Council, 1995). Most of these relate experiences and convey advise about how the planning process did or will work in these areas and have much to say in favor of trail and greenway resources in the face of increasing urban sprawl, inactive life styles and the loss of biodiversity.

More recently work has been published that is directed less at how to develop trails and greenways and more at their role as land uses in the context of developed areas. Subdivision design (Arendt, 1996) and stream restoration (Riley, 1998) are often closely aligned with greenway and trail projects, and practitioners and academics are beginning to address these "multiple objectives" with detailed publications, often including case study examples. The greenways movement in particular can be closely tied to the development of a literature related to landscape ecology and land use planning. Smith and Hellmunds' (1993) edited volume on the ecology of

greenways and Fabos and Ahern's (1995) edited volume of three 1993 issues of *Landscape and Urban Planning* exemplify the increasing attention being paid to these resources in fields outside of parks and recreation.

From a recreational standpoint, trails and greenways are typically seen as facilities that both provide for and manage people. Therefore, much of the literature referred to above contains sections that deal with design issues, such as trail tread that are wide enough to accommodate multiple uses but are also attractive, cost efficient and easy to maintain (e.g., Ryan 1993). Designing greenway corridors and trails that reflect the surroundings, are aesthetically appealing, accommodate multiple user groups, are sufficiently large for wildlife habitat and migration, and address a jurisdiction's surface transportation policy can be a daunting balancing act. Trails and greenways, like roadways, are likely to have long-lasting influences on individuals and communities, providing opportunities and in some cases creating conflicts.

In recent years trail planners and managers have often found themselves at odds over the issue of accessibility as dictated by the Americans with Disabilities Act (ADA) ("Can We Build Accessibility," 2001). Concerns have revolved around increased construction costs in making trails accessible; however, the most heated debates focus on the potential change in the experience that trails would provide. For example, note the following remarks from a recent interview with the Executive Director of the Appalachian Trail Conference. "The most commonly voiced concern is that modifications could fundamentally alter the nature of the Appalachian Trail experience" ("Can We Build Accessibility", 2001, p. 7). The task of formulating policy for trail access and suggesting appropriate design is very much an evolving process; however, there is current literature to help trail planners address these issues (e.g., Axelson et al., 1999, PLAE Inc., 1993).

For researchers, trails have proven to be an ideal research laboratory for examining many types of recreation and leisure behavior. Much outdoor recreation behavior occurs on trails, and trails and trailheads can be a convenient place to contact other outdoor recreationists as they travel to or from their destinations for many other activities like fishing, hunting, camping, participating in wilderness programs, etc. Examples of the types of topics that have been, are, or could be examined in trail settings include recreational conflict, crowding, satisfaction, substitution, displacement, place attachment, responsible use, volunteerism, effects of user information and education efforts, effects of environmental education programs or interventions with youth at risk, partnerships, the dynamics of adventure recreation, and much more. Although there is considerable research related in some way to trails or trail use, there are important gaps that must be addressed if this area of study is to better meet its basic and applied potential.

In general, sustained lines of research built around theory and solid conceptual frameworks are needed to bolster existing trails and greenways literature. Some of the needed theory and concepts have yet to be

developed and range from the seemingly mundane to those that could have important implications for leisure research in general. At the most foundational level is the need for more work involving defining trail and greenway resources. Although definitions abound, including those noted in this paper, work is needed to develop more meaningful typologies of trails. Schmitt (2001) has produced a helpful glossary of trail terms and acronyms to help clarify and unify the vocabulary of trail planners and field managers. As scholars we need to do the same. Shared definitions would help with the challenging tasks of defining the scope and breadth of existing trail resources as well as planning for future trail needs. For example, practitioners charged with greenway and trail development often find stakeholder groups at odds regarding what constitutes a greenway or what type of trail is appropriate. Anecdotal evidence suggests that developers often view “greenways” simplistically, feeling that rechanneling a drainage and removing existing vegetation are acceptable as long as the new channel is lined with green grass and not concrete. Local environmental groups or neighborhood associations often have very different ideas about how the same piece of land should look and function.

Trails are only one type of linear corridor used for recreation. Frameworks that attempt to characterize the different types of trails would be more powerful if they could be extended to look at how various types of linear corridors may be similar or different. What are the meaningful differences in terms of use and experience between trail users and river users, for example, since both are linear corridors that typically involve travel from one place to another as part of the experience.

More concepts and theoretical work related to trail activities and experiences may also be fruitful areas of study. In terms of activities for example, walking, hiking, day hiking, backpacking, trail running and others are all pedestrian activities that can take place on trails, but how do they relate to one another, and what are the meaningful variables that distinguish among them? Are some “activities,” others “sub-activities,” and still others simply activity “styles”? In terms of trail experiences, a basic question that seems to have been overlooked or ignored as being too obvious to ask is whether there really is a “trail experience.” Do the experiences people have on trails tend to be distinct because they occur on trails, or are they more generally focused on other aspects like the environment in which the trail is located or the users’ companions? What variables affect these and other dimensions of a “trail experience”? What implications, if any, might these differences in experience have for trail design or land use? There seem to be opportunities to build, for example, on the work of Hammitt (1987) and Hull and Stewart (1995) related to how people perceive the environment in a linear experience and through sequential events. Revisiting older concepts developed by Appleyard, Lynch and Myer (1964) that are based on highway experiences related to design may also help in understanding how trails may lead to specific experiences. Lee’s (1999) work on the

emotional responses elicited through encounters along an urban trail also provides an impetus for a better understanding of how the dynamic nature of linear activities and resulting encounters create leisure experience.

More work is also needed in terms of the benefits that trails and trail use generate for users, nonusers, communities and society at large. How do these benefits relate to quality of life in general, and how can these benefits best be measured? How do linear open spaces impact community members who neither use them nor live near them. For example, do greenway and trail amenities figure prominently into location decisions made by companies? As Crompton points out in this issue, much of the research on topics related to benefits beyond the user exists in bits and pieces, having been conducted by local entities attempting to justify trail development.

In terms of planning and management, a better understanding of the physical aspects of trails is needed. What are the trade-offs between simple ease of access to trails (e.g., locating a trail in a greenway behind homes) and the views that a greenway and trail corridor might create (e.g., locating a greenway trail adjacent to streets)? What are the impacts of trails and trail use on the physical environment? How do communities and other groups decide how many and what types of trails to build? Are there innovative applications of geographic information system technologies in this regard? According to a survey of 512 managers of National Recreation Trails, resource damage, user safety, and social conflicts were the most pressing trail-related concerns (Chavez et al. 1999). What are the trends regarding managers' concerns about these and other issues, and do users share these concerns? These are just some of the directions continued research on trails could take. There is no shortage of interesting and important questions to ask.

The Papers in this Special Issue

The six papers in this special issue of *JPRRA* make a strong start at addressing some of the questions identified above. They are varied in terms of topics and approaches and demonstrate the breadth of the disciplines that can be brought to bear in terms of trail research. The papers included generally progress from a focus on the physical trail resources themselves, to a focus on trail users and their behavior, and finally a look at the benefits of trails and their use for individuals and their communities. The 1st paper in this issue, Marion & Leung's "Trail Resource Impacts and an Examination of Alternative Assessment Techniques," provide an excellent summary of the literature related to the physical impacts of trail use and make an empirical comparison of two common techniques for measuring trail impacts. The 2nd paper by Hendricks, Ranthum & Chavez, expand the focus on impacts with "The Effects of Persuasive Message Source and Content on Mountain Bicyclists' Adherence to Trail Etiquette Guidelines." Their interest is on both physical and social trail use impacts and how best to minimize them. This paper is noteworthy, in part, because it relies on actual observation of user behavior rather than the far more common survey research of our literature.

The next two papers attempt to segment trail users using two very different approaches. "Differences Between Motorized and Nonmotorized Trail Users" by Andereck, Vogt, Larkin & Freye looks at differences based on broad activity types and how these differences may affect perceptions and attitudes. "A Benefit Segmentation of Rail-Trail Users: Implications for Marketing by Local Communities" by Bichis-Lupas & Moisey approaches user differentiation based on the benefits sought by users rather than their activities.

The 5th paper, "Using a Means-Ends Approach to Understand the Factors that Influence Greenway Use" by Frauman and Cunningham examines how trail attributes and the benefits sought by users relate to the underlying values associated with their greenway use. The approach and marketing applications are thought provoking and have numerous implications. The issue concludes with an examination of the broader implications of trails and trail use. Crompton's "Perceptions of How the Presence of Greenway Trails Affects the Value of Proximate Properties" summarizes the fledgling literature in this area that is of great interest to trail planners and trail advocates.

Summary and Conclusions

There are many challenges in terms of trails and greenway planning, management and research, some very practical and applied, others more basic. There are great opportunities as well. In urban areas, trails and greenways allow, even require, park and recreation providers to think outside the proverbial box. That is, in most cities, parks still exist as a set of unconnected patches of land each serving a neighborhood. Trails and greenways can act as the connecting fabric within these park systems and from park systems out into other parts of communities. Partnerships with planners, transportation engineers, health professionals, public works departments, schools and developers may all be a part of connecting people and places through a green infrastructure. There are also new and decades-old volunteer citizens organizations that expend large quantities of time and resources in their efforts to designate, build and maintain trails and greenways. Citizens groups, private developers and government officials are paying more and more attention to trails as potential enhancers of quality of life and shapers of growth. All of these are potential partners, supporters and funders for trail development and research.

As a community of scholars, we know a great deal about how and why people use trails and greenways. There is a large and growing body of scholarly research that relates in some way to trails. However, direction, focus and collaboration are needed to pursue the many important things we do not yet understand well about trails, their impacts, and their effects on communities. As scientists and practitioners, our research can and should improve our understanding of this important subset of recreation resources and user behavior. It is our hope that the papers in this special issue make a strong contribution to this effort.

References

- American Trails (1990). *Trails for all Americans: The Report of the National Trails Agenda Project*. Washington, D.C.: U.S. Department of the Interior, National Park Service.
- Appleyard, D., Lynch, K., & Meyer, J.R. (1964) *View from the road*. Cambridge: MIT Press.
- Arendt, R. (1996). *Conservation design for subdivisions: A practical guide to creating open space networks*. Washington, D.C.: Island Press.
- Austin Metropolitan Trails Council (1995). *Building a network of trails and greenways for Austin*. (Available from the Trust for Public Land Field Office, 700 San Antonio St., Austin, TX, 78701)
- Axelson, P.W., Chesney, D.A., Galvan, D.V., Kirschbaum, J.B., Longmuir, P.E., Lyons, C., & Wong, K.M. (1999). *Designing sidewalks and trails for access: Part I*. (Publication No. FHWA-HEP-99-006). Washington, D.C.: U.S. Department of Transportation.
- Baschek, L.A., & Brown, R.D. (1995). An ecological framework for the planning, design and management of urban river greenways. *Landscape and Urban Planning*, 33(1-3), 211-226.
- Bueno, J.A., Tshrintzis, V.A., & Alvarez, L. (1995). South Florida greenways: A conceptual framework for the ecological reconnectedness of the region. *Landscape and Urban Planning*, 33(1-3), 247-266.
- Can we build accessibility into our backcountry trails? (2000). *Trail Tracks*, 30(1), 6-7.
- Chavez, D.J., Harding, J.A. & Tynon, J.F. (1999). National Recreation Trails: A Forgotten Designation. *Journal of Forestry* (97)10, 40-43.
- Conservation Fund (2001). <http://www.conservationfund.org/conservation/amgreen/index.html>
- Cordell, H.K., Betz, C.J., Bowker, J.M., English, D.B.K., Mou, S.H., Bergstrom, J.C., Teasley, R.J., Tarrant, M.A. & Loomis, J. (1999). *Outdoor recreation in American life: A national assessment of demand and supply trends*. Champaign, IL: Sagamore Publishing.
- Dramstad, W.E., Olsen, J.D., & Forman, R.T. (1996). *Landscape ecology principles in landscape architecture and land use planning*. Washington D.C.: Island Press.
- East Bay Regional Park District. (1997). *Iron Horse Regional Trail trail use study*. (Available from the East Bay Regional Park District, 2950 Peralta Oaks Court, P.O. Box 5381, Oakland, CA 94605-0381)
- Fabos, J.G. (1995). Introduction and overview: The greenway movement and uses of potential greenways. *Landscape and Urban Planning*, 33, 1-14.
- Fabos, J.G., & Ahern, J. (1995). *Greenways: The beginnings of an international movement*. New York: Elsevier.
- Flexner, S.B. (Ed.). (1993). *Random House Unabridged Dictionary* (2nd ed.). New York: Random House.
- Flink, C.A., Olka K. & Searns, R. M. (2001). *Trails for the twenty-first century (Second Edition): Planning, design and management manual for multi-use trails*. Washington, DC: Island Press.
- Flink, C.A., & Searns, R.M. (1993). *Greenways: A guide to planning, design and development*. Washington D.C.: Island Press.
- Florida Department of Environmental Protection and Florida Greenways Coordinating Council. (1998). *Connecting Florida's communities with greenways and trails*. (Available from the Florida Department of Environmental Protection, Office of Greenways and Trails, 2600 Blair Stone Road, MS 795, Tallahassee, FL 32399-2400)

- Goldbloom, A. (1992). *The 1991 Texas trails study*. (Available from the Texas Parks and Wildlife Department, 4200 Smith School Road, Austin, TX 78744)
- Hammitt, W.E. (1987). Visual recognition capacity during outdoor recreation experiences. *Environment and Behavior*, 19, 478-493.
- Hay, K.G. (1991). Greenways and biodiversity. In W.E. Hudson (Ed.), *Landscape linkages and biodiversity* (pp.162-175). Washington D.C.: Island Press.
- Hellmund, P.C. (1993). A method for ecological greenway design. In D.S. Smith & P.C. Hellmund, P.C. (Eds.), *Ecology of greenways: Design functions of linear conservation areas* (pp. 123-160). Minneapolis: University of Minnesota Press.
- Hull IV, R.B., & Stewart, W.P. (1995). The landscape experienced and encountered while hiking. *Environment and Behavior*, 27, 404-426.
- Lee, B. (1999). *The dynamic nature of emotions during a trail-based leisure experience: An application of affect control theory*. Unpublished doctoral dissertation, Texas A&M University, College Station.
- Little C.E. (1990). *Greenways for America*. Baltimore: The Johns Hopkins University Press.
- Mertes, J.D., & Hall, J.R. (1996). *Park, recreation, open space and greenway guidelines*. Reston VA: National Recreation and Park Association.
- Moore, R.L., Siderelis, C., Lee, Ju-Hee, Ivy, M.I., & Bailey, G. (1999). *1998 North Carolina State Trail and Greenway Survey*. North Carolina Department of Environment and Natural Resources, Division of State Parks.
- Moore, R.L., & Ross, D.T. (1998). Trails and recreational greenways: Corridors of benefits. *Parks and Recreation* (33)1, 68-79.
- Moritz, W.E. (2000). Burke-Gilman/Sammamish River Trails: User counts and survey results. *Puget Sound Trends*, T14. (Available from the Puget Sound Regional Council, 1011 Western Avenue, Suite 500, Seattle, WA 98104-1035)
- New England Greenway Vision Plan. (2001). <http://www.umass.edu/greenway/>
- PLAE, Inc. (1993). *Universal access for outdoor recreation: A design guide*. MIG Communications.
- President's Commission on Americans Outdoors (1987). *Americans Outdoors: The Legacy, the Challenge*. Washington, D.C.: Island Press.
- Rails-to-Trails Conservancy (2001). http://www.railtrails.org/RTC_active_pages/Home/Main
- Riley, A.L. (1998). *Restoring rivers and streams in cities: A guide for planners, policymakers, and citizens*. Washington D.C.: Island Press.
- Ryan, K.L. (Ed.). (1993). *Trails for the twenty-first century: Planning, design and management manual for multi-use trails*. Washington, DC: Island Press.
- Schmid, Jim (2001). *Trails Primer: A Glossary of Trails, Greenway, and Outdoor Recreation Terms and Acronyms*. Columbia, SC: South Carolina Department of Parks, Recreation and Tourism, State Trails Program.
- Searns, R.M. (1995). The evolution of greenways as an adaptive urban landscape form. *Landscape and Urban Planning*, 33, 65-80.
- Shafer, C.S., Scott, D. & Mixon, J. (2000). A greenway classification system: Defining the function and character of greenways in urban areas. *Journal of Park and Recreation Administration*, 18, 88-106
- Shafer, C.S., Lee, B. & Turner, S. (2000). A tale of three greenway trails: User perceptions related to quality of life. *Landscape and Urban Planning*, 49, 163-178.
- Smith, D.S., & Hellmund, P.C. (Eds.) (1993). *Ecology of greenways: Design and function of linear conservation areas*. Minneapolis: University of Minnesota Press.

University of South Carolina (1992). *Public attitudes on recreation trails and related activities*. Columbia, SC: University of South Carolina, Institute of Public Affairs.

Walmsley, A. (1995). Greenways and the making of urban form. *Landscape and Urban Planning*, 33, 81-127.

Waterman, L., and Waterman, G. (1989). *Forest and Crag: A History of Hiking, Trail Blazing, and Adventure in the Northeast Mountains*. Boston, MA: Appalachian Mountain Club.