

# IQ SERVICE REPORT

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## TRAILS AND GREENWAYS

**T**rails and greenways provide access to open space and fulfill many of the recreational functions of a traditional park. They promote public safety by separating pedestrians and cyclists from motor traffic. They improve public health by giving citizens a place for leisurely strolls or vigorous workouts. They conserve greenspace and provide a transportation alternative to driving.

Increased federal funding for alternative transportation has stimulated the growth of these “off-road” routes. The abandonment of railroad lines coupled with government assistance in preserving them as transportation routes has spurred a dramatic increase in conversion of rail corridors to trails and greenways.

This report describes the experience of small towns, counties, and cities in planning, funding, constructing, and managing trails and greenways. It includes resources for planning and managing trails and greenways—from the initial idea through assessment of usage.



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# Trails and Greenways

*John Hartman of the Arden Research Company, St. Louis, Missouri, wrote this report. Arden Research does public policy research for government and nonprofit organizations, including survey research, analysis, and consulting. A recent study focused on trail use in St. Louis's Forest Park.*

The popularity of trails and greenways has increased dramatically in recent years. The surge in public interest stems from several causes. The U.S. government provided significant impetus by providing funding through the Intermodal Surface Transportation Equity Act (ISTEA), passed in 1991, and the Transportation Equity Act for the 21<sup>st</sup> Century (TEA-21), passed in 1998. Passage of the Staggers Act of 1980 and the National Trails System Act of 1983 also spurred the conversion of abandoned rail lines to trails and greenways.

The public health community's increased emphasis on the importance of exercise is another reason for the growing popularity of trails and greenways. Commuters' frustration with automobile travel also has prompted calls for alternative forms of transportation.

Finally, there has been a new public awareness of the need to conserve open space. The National Center for Bicycling and Walking, the Rails-to-Trails Conservancy, and other interest groups advocate trails and greenways because of the contributions they make to livable communities. The result has been a rise in the number of trails being constructed.

## A SNAPSHOT OF CURRENT PRACTICE

The following case studies present different perspectives on trails and greenways.

### What is a greenway?

*Greenway.* The term sounds so simple that it often invites misinterpretation. Is it a path? A vegetable garden? A golf course? The builders of a well-tended Virginia toll road into downtown Washington are calling this multilane highway a greenway. Is it?

"Greenways are many things to many people," explains Chris Brown, deputy chief of the National Park Service's Recreation Resources Assistance Division. "And that's one of their virtues. On a single project, neighbors, walkers, recreational bikers, transportation planners, and wildlife lovers can come together to make it all happen. But ultimately, a greenway does have some definition. It connects community resources, it's linear, and it's vegetated. Think of greenways as those long, skinny, green parks."

The Conservation Fund ([www.conservationfund.org](http://www.conservationfund.org)) describes greenways as "corridors of protected open space managed for conservation and recreation purposes."

The city of Vancouver, British Columbia, uses the following definition: "Greenways are green paths

for pedestrians and cyclists. They can be waterfront promenades, urban walks, environmental demonstration trails, heritage walks, and nature trails."

Greenways are corridors of protected open space managed for conservation and recreation purposes. Greenways often follow natural land or water features, and they link nature reserves, parks, cultural features, and historic sites with each other and with populated areas. Greenways can be publicly or privately owned, and some are the result of public-private partnerships.

Trails are paths used for walking, bicycling, horseback riding, or other forms of recreation or transportation. Some greenways include trails, while others do not. Some greenways appeal to people, while others attract wildlife.

Sources: Noel Grove, "Greenways: Those Long, Skinny, Green Parks," *Land & People* (Trust for Public Land: Fall 1994); Fact Sheet, "Benefits of Trails and Greenways," Trails and Greenways Clearinghouse ([www.trailsandgreenways.org](http://www.trailsandgreenways.org)).

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### Manchester, Vermont—Public-Private Cooperation

In Manchester, Vermont (population 4,000), a committee of volunteers is overseeing the construction of a trail half a mile long that will connect an elementary school in the downtown area with the town's new recreation center, which includes a skating rink and concert hall. The trail will follow the west branch of the Battenkill River along land previously owned by the town.

The trail project represents an example of public-private cooperation. A private donation of land made the path possible. As part of the project an existing bridge over the river was upgraded, and another bridge will be constructed by a private business as a voluntary contribution. The grading and application of the crushed stone surface will also be a voluntary contribution by a local company. The entire project will be paid for by privately donated funds or voluntary work.

Even though the trail is not being constructed with commuters in mind, it is expected to provide a transportation corridor connecting the school and recreation center. The nonmotorized trail is intended to provide safe passage for children going back and forth.

A possible extension of the trail along an abandoned rail corridor would connect it to an elementary school in the nearby town of Dorset, Vermont.

### Glen Carbon, Illinois—A Village Amenity

In Glen Carbon, Illinois (population 11,000), the Ronald J. Foster Heritage Bike Trail follows an abandoned Illinois Central Railroad corridor through the growing village. At one end of the trail is a popular ballpark with restrooms, a drinking fountain, other amenities, and a parking lot for 50 vehicles. The trail passes near the village's principal park, Minor Park, and ends at a high-

volume road, where a parking lot for 20 vehicles has been constructed.

A 3.5-mile extension of the trail is being planned farther along the same rail corridor at a cost of \$450,000, evenly split between the village and the Illinois Department of Natural Resources.

The trail is between 10 and 12 feet wide and surfaced with a coarse gravel and oil pavement. The surface is resealed approximately every seven years. Prairie grass restoration sites have been established along the trail, thanks to cooperation between the village and the state department of natural resources.

Where the trail passes near Minor Park, organizations sometimes gather to hold special events, such as fundraisers. Trail use is integral to these events.

### Mountain View, California—A Phased Approach

In Mountain View, California (population 75,000), the Stevens Creek Trail has been constructed in four reaches along the banks of Stevens Creek, a tributary of San Francisco Bay that flows through the city. Beginning at a regional recreational area, the trail follows the creek through an area of office buildings and connects residential neighborhoods, schools, parks, and transportation arteries.

Despite the density of the area surrounding the Stevens Creek Trail, there are only two at-grade street crossings. The 10-foot-wide asphalt trail (with 2-foot clearances on each side) was designed to support equipment performing maintenance tasks and provide access to utility towers along the trail. California Class One standards for bicycle path design were used. They provide for gentle curves and slopes with sight distances that invite safe speeds.

Early user surveys show that trail use was approximately 35 percent for commuting purposes and 65 percent for recreational purposes, approximately 25 percent of the commute trips involved intermodal transportation, and approximately 36 percent of those commuting to work reported previously driving single-occupancy vehicles to work.

### Evansville, Indiana—Comprehensive Planning

The city of Evansville, Indiana (population 126,000), is constructing the Pigeon Creek Greenway Passage, a 25-mile loop around the city. Once spurs are added, the passage will create 42 miles of asphalt trail.

The loop and spurs will connect elementary and high schools, existing trails, and the riverfront of the Ohio River. The American Discovery Trail (see sidebar on page 3) will be carried by the greenway system.

Funding totalling \$5.2 million has come from the city, county, state, and federal governments, including TEA-21 matching funds. Greenway administrators are applying for an additional \$7 million. The path is being built in conformity with guidelines issued by the American Association of State Highway Transportation Officials (AASHTO).

#### Sustrans in the United Kingdom

Sustrans—short for sustainable transport—is a charity in the United Kingdom working on practical projects to encourage people to walk and cycle more in order to reduce motor traffic and its adverse effects. It coordinates the National Cycle Network and Safe Routes to Schools projects. According to Sustrans:

- Up to one in five cars at peak time is taking students to school, four times as many as 20 years ago. (National Travel Survey, 1995, United Kingdom Department of Environment, Transport and the Regions)
- In slow-moving traffic, pollution levels are higher inside cars than outside. (Environmental Transport Association Trust, 1998)
- On average, one in seven children suffers from asthma, and in inner city areas the rate is as high as one in three. (British Lung Foundation, 1997)

See [www.sustrans.org.uk](http://www.sustrans.org.uk).

A committee of government officials and private citizens meets monthly to oversee planning and construction of the greenway. Subcommittees support the full committee in the areas of technology, arts, safety, youth, education and marketing, finance, historic preservation, land use, and cleanup. All of the various committees are chaired by volunteers.

The arts subcommittee approached the University of Southern Indiana about creating public art to be installed along the greenway. The full committee provided funding for the materials, and students in the university's art department created models of proposed installations for review by various authorities. Once their plans were approved, the students completed three installations, which have been well received by the community. Unfortunately, vandalism has been a problem since the art was installed.

### **Vancouver, British Columbia—Promoting Alternative Transportation**

The Vancouver Greenways will be an extensive network of trails within the city of Vancouver, British Columbia (population 520,000). The 140-kilometer (87-mile) network of trails is designed to connect virtually all principal destinations of the city. When the network is completed, a city greenway should be no more than a 25-minute walk or a 10-minute bicycle ride from all city residences.

Approximately one half of the network is built exclusively for cyclists, skaters, and pedestrians. These nonmotorized greenways include popular shoreline trails that will encompass the entire coastline of the city.

The other half of the network is composed of street right-of-ways where traffic-calming techniques enable cyclists to share the street with motorized traffic. Because the streets are wide, separate lanes with painted lines have not been used. Traffic-calming measures along the streets that carry the greenway include boulevard bulges (areas where the boulevard juts out to narrow the lane), traffic circles (an unpaved circle, which may include public art, in the middle of a conventional intersection), on-street pedestrian amenities, landscaping, plazas, and street closures.

Additionally, there are neighborhood greenways, which are short additions to the city greenway network. They allow neighborhoods to adapt the greenway system to their community. Financial assistance for neighborhood greenways is provided by the city.

Most of the funding for the city greenway network comes from the city. The network is not administered by the transportation department. It is a program shared by the engineering department and the planning department.

The greenways are integrated into the larger transportation system. A new rapid transit line will coexist in a corridor with a greenway, and bicycles will be allowed on the transit cars. Buses are equipped with bicycle racks. The greenways are tied into the larger regional greenway system. These transportation alter-

### **The American Discovery Trail**

The American Discovery Trail is more than 6,300 miles of continuous multi-use trail stretching from Cape Henlopen State Park, Delaware, to Point Reyes National Seashore, California. The first coast-to-coast, nonmotorized trail, it leads to 14 national parks and 16 national forests. The American Discovery Trail links the states of California, Nevada, Utah, Colorado, Nebraska, Kansas, Iowa, Missouri, Illinois, Indiana, Ohio, Kentucky, West Virginia, Maryland, and Delaware. For more information, visit the trail's Web site at [www.discoverytrail.org](http://www.discoverytrail.org).

### **Public Art**

Sustrans, a charity in the United Kingdom, has made wide use of public art in its National Cycle Network and Safe Routes to Schools projects.

The National Cycle Network features England's biggest collection of outdoor public art—spread across thousands of miles and accessible to all. Artworks vary from large earthworks and "growing sculptures" to small details like fountains, seats, access points, and gateways.

The artworks, waymarkers, environmental earthworks, and landscape sculptures reflect the local characteristics of settlements and communities that the greenways pass through. The artworks bring diversity and uniqueness to different sections of the route.

Photographs of the public art, including the Bristol and Bath Path Sculpture Trail, may be viewed on the Internet at [www.sustrans.org.uk/f\\_site.htm](http://www.sustrans.org.uk/f_site.htm).

natives have made it possible for many new residents who have moved in during the city's recent growth to do without cars.

According to Vancouver's transportation plan, road capacity is to be held at 1997 levels for the next 25 years. Transportation alternatives are the key to meeting this goal. In many European and Asian cities, bicycle trips account for more than 25 percent of all urban trips; in Vancouver, at present, they account for only about 3 percent.<sup>1</sup>

### **Pinellas County, Florida—A High Capacity Trail**

The Pinellas Trail runs for 35 miles through Florida's most densely populated county, Pinellas County (population 852,000). In some months, as many as 90,000 persons use the trail. To enable users to avoid intersections with high traffic, the county constructed six overhead passages along the trail. The 88 lower-volume intersections have stop signs or activated traffic signals.

One of the unique features of the trail is a \$1.5 million, 3,000-foot-long bridge. The trail winds past an-

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cient live oak glades and tidal streams with a wide variety of aquatic and coastal birds. The trail also passes near two elementary schools, a high school, a butterfly garden, produce markets, a museum, numerous parks, a bus station, a mall, a softball complex, and an historic downtown.

The Bicycle Advisory Committee and the Pedestrian Safety Committee of the Pinellas County Metropolitan Planning Organization initiated the trail as a safe place to enjoy cycling, jogging, and walking along a corridor of abandoned CSX railroad right-of-ways.

To handle the high volume of traffic expected, the trail was made as wide as possible. The predominant width of the trail is 15 feet within a corridor 60 feet wide. Painted symbols on the surface designate 10 feet of the width for cyclists and skaters. Five feet are designated for walkers, joggers, and strollers. In some places a 10-foot-wide grass median separates the "wheels" from the "heels." Amenities abound along the trail, including a doggie drinking fountain.

A 1992 survey found that 35 percent of the traffic on the trail was for transportation purposes: commuting to work and to school, as well as shopping. These trips would have been made by car had the trail not been available. The use of the trail for alternative transportation made it possible for administrators to seek and receive congestion mitigation and air quality (CMAQ) funds from the federal government.

### Chicago, Illinois—Building Bicycle Routes

The city of Chicago, Illinois (population 2,783,000), plans to have 300 miles of designated routes for bicycles in use by the end of 2001. Of these, 40 miles will be exclusively nonmotorized trails and greenways, 100 miles will be bicycle lanes, and 160 miles will be signed bicycle routes, mainly on city streets. When completed, the system will resemble a grid with routes spaced at 1.5- to 2-mile intervals, crossed by popular diagonal

#### Greenways and air quality

In 1990, the Vancouver, British Columbia, city council endorsed "Clouds of Change," a report that called for numerous initiatives to improve air quality. These initiatives address emissions, transportation, land use, and energy use issues.

In 1992, the city council endorsed a report outlining high occupancy vehicle (HOV) treatment policies. Other initiatives aimed at reducing automobile use include greenways, bicycle networks, requirements in new developments for bicycle parking and showers, a moratorium on construction to increase roadway capacity, and a downtown parking policy that effectively restricts available parking in developments. The city set a target for the downtown in the morning peak periods of 60 percent use of nonautomobile modes of transportation.

routes composed of striped bicycle lanes. All of these routes have ample connections to greenways.

The nonmotorized Lakefront Path is the most heavily traveled route in the city. With a trailhead at the Southshore Cultural Center in the southern part of the city, the path follows the Lake Michigan shoreline to near Loyola University in the far northern part of the city. In use for many years, the path passes through many historic areas and parks. It is connected to the larger grid at access points spaced approximately every half mile.

In addition, two trails on converted rail corridors and two trails following rivers within the park system are nonmotorized. These trails also have access points spaced approximately every half mile.

The routes are administered by three cooperating agencies: the Chicago Department of Transportation, the Chicago Park District, and the Forest Preserve District of Cook County. Matching funds have been applied for by each of the agencies, which may then act separately or pool funds with other agencies to complete projects. Between 1992 and 1999, the total amount of grants awarded from all sources for bicycle and pedestrian routes and amenities totaled \$19 million.

The routes are actively promoted as a transportation alternative. Extensive amenities encourage the public to use the routes. For example, the 5,000th bicycle rack was recently installed. Every year during Bike Week, approximately 30 events are scheduled to draw public attention to the routes. In one event, the "Commuter Challenge," media celebrities compete in a commuting race using the full array of transportation alternatives. In 2000, Bike Week was expanded to Bike Month.

The city conducts usage studies. For example, on Sunday, August 1, 1999, between 4 and 5 p.m., 1,094 bicyclists, 772 pedestrians/joggers, and 241 skaters crossed a point on the Lakefront Path. On Tuesday, August 3, 1999, between 7 and 9 a.m., 567 cyclists, 334 pedestrians/joggers, and 27 skaters crossed a point downtown on the Lakefront Path.

### PLANNING THROUGH AGENCY COORDINATION AND PUBLIC INPUT

Because trail and greenway projects often last longer than projects involving public parks, they tend to involve more agencies and organizations. Planners of the Stevens Creek Trail in Mountain View, California, claim that the inclusion of groups early in the planning phase was essential in subsequent planning and construction. Input from all affected parties before decisions were made facilitated subsequent steps.

#### Administrative Structure

Various organizational arrangements have been made to plan and administer trails. Extensive trail systems require substantial participation from various agencies

and voluntary groups: short trails can be entirely administered by the parks and recreation department of one municipality.

Planners in Mountain View, California, recognized early the need for the cooperation of numerous government agencies in the planning and construction of the Stevens Creek Trail. Extensive early planning meetings were conducted with the U.S. Corps of Engineers, fish and game representatives, two school districts, county roads, the valley transportation authority, the water district, the state highway department, the local gas and electric utility, the regional open space district, and others. All of the stakeholders were involved from the inception of the trail and the necessary permits were secured early on.

The development of the Pigeon Creek Greenway Passage in Evansville, Indiana, necessitates monthly meetings of a full committee to plan the next phases of the trail and then to oversee trail construction and maintenance. The full committee is composed of government officials and citizens. Subcommittees on arts, safety, youth, marketing, and technology support the full committee.

Madison County, Illinois, is planning an extensive expansion of its trails, which are managed largely within the Madison County transit organization. This county transit group, in cooperation with Southern Illinois University at Edwardsville, is constructing trail extensions that connect to the university's campus.

### Public Input

The public participated actively in planning the path projects reviewed for this study. At special meetings the public had opportunities to provide input. Trail advocates, trail opponents, and those simply seeking information had the chance to share their views and hear the opinions of other citizens.

The public works manager in Mountain View, California, developed a plan to encourage public participation concerning a potentially controversial extension of the Stevens Creek Trail. Two neighborhood workshops were held. A mailing and a newspaper announcement alerted residents in the affected neighborhoods about the meeting. Each workshop was attended by more than 100 citizens. Three public hearings with the parks and recreation commission followed the workshops, and they also were well attended. Two meetings of special interest groups were held, and advocates with differing opinions were invited to explain their views. The meetings were followed by another neighborhood workshop. Only then did the plan go back to the city council for review at two more meetings.

Many issues arose during this extensive planning process. Some residents feared that the trail would become a conduit for crime, that it would increase traffic in the adjoining neighborhoods, and that it might adversely affect prices for nearby real estate. Others discussed the recreational benefits of the path, the need for open space, and the advantages of having a trans-

portation alternative for commuting.

The special interest group meetings presented various options for trail alignment and access points, and citizens' reactions were welcomed. Citizens were also invited to propose their own designs. Data were presented regarding safety, parking, and the possible affect of the Stevens Creek Trail extension on real estate prices. The real estate data were based on the experience of other trail and greenway projects. This information served to alleviate the concerns of most residents. Some participants, however, were not sure the data were relevant to the circumstances of the Stevens Creek Trail.

Not all trails are controversial. For example, the city administrator in Port Washington, Wisconsin, Mark Grams, reported that the trail going through town on a former rail corridor presented no substantive problems to the citizens who were affected. At public hearings on the trail, a description of the path was presented, but the meetings drew little attention.

### INITIAL STEPS

Mountain View, California's process for developing a trail is typical: following the city council's review of funding and subsequent decision to proceed with the trail (with input from citizens), the parks and recreation department proposed a design. The city then hired a civil engineer as a lead consultant. This person led a team of subconsultants doing work on fire protection, parking, access points, geotechnical aspects of a tunnel, safety, environmental clearance, and wildlife issues.

### Locating the Routes

Trail planners seldom have the luxury of placing trails precisely where they might provide the maximum benefit. The existing environment (natural and manmade) largely determines which routes are feasible. As Randy Newfeld of the Chicagoland Bicycle Federation stated, "We build them where we have the opportunity to build them."

Many trails follow rail lines, utility corridors, or waterways. In these cases street intersections have been minimized, and planners can take advantage of expensive infrastructure assets already in place, such as bridges. Adopting an existing corridor is often easier and less costly than acquiring new land for a trail or greenway.

The placement and use of trails can have an effect on the social interaction and public health of neighborhoods. Under TEA-21, transportation planning involves consideration of environmental, cultural, economic, and social conditions. The objective is to create a more balanced transportation system that provides people with choices and a richer common experience.

Among the factors that can integrate a trail or greenway into the life of a community is its proximity

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to schools. Only about one out of every ten children walks to school. From 1977 to 1995 the total number of walking and bicycling trips made by children declined by 63 percent, according to the Center for Disease Control and Prevention (CDC). To promote healthier, safer lifestyles for kids, the CDC has issued a step-by-step handbook titled *KidsWalk-to-School: A Guide for Community Action to Promote Children Walking to School*.

In Mountain View, the Stevens Creek Trail links neighborhoods and schools, and it also links neighborhoods that were previously separated by a freeway, railroad, or major arterial roads. People now walk together to events at the performing arts center, the library, and other public facilities along the trail.

### Anticipating Legal Issues

Legal issues tend to be specific to the trail or greenway being reviewed. Some general considerations, however, apply to all local governments anticipating trail-related legal issues.

A title report should be made on all lands considered for acquisition. Easements, leasehold interests, or restrictive covenants may give other parties certain rights to use a corridor. A title report should address jurisdictional issues regarding local, state, and federal laws, as well as encumbrances on a title, such as tax liens, mortgages, and mechanics' liens.

A survey of the land helps establish boundaries and documents encroachments and other boundary issues. If title insurance is to be acquired, a discussion about the survey should be held with the title insur-

ance company before the survey is taken.

An environmental assessment of the property should be made to document hidden or obvious environmental hazards. A physical inspection of the property should be accompanied by a review of documents about the property's history. The cost of cleaning up environmental damage may become part of the negotiations.

Trails should be designed and managed in a way that minimizes risks to users and reduces liability. Property owners and managers of the trail should be aware of the risks and provide coverage through liability insurance. The risks associated with a trail can usually be covered under a local government's (or state's) umbrella insurance policy.

Many trails use signage to educate the public about rules on the trail. Signage may include descriptions of the law. For example, cyclists may be reminded that they are legally required to wear helmets.

Compared with other public facilities, trails are quite safe—often less risky than roads and safer than swimming pools, beaches, and children's playgrounds. In general, insurance can be budgeted as a cost in the development and maintenance of the trail, a cost that many communities feel is a small price to pay for a valuable community facility.

### Safety Issues

Citizens often express concerns about safety. While crime may be their foremost concern, a more immediate problem for users of the trail may be accidents caused by competing uses.

**Conflicts among trail users.** A study of rail-trails in Iowa, Florida, and California found that users reported little problem with conflict on average. More than 2,000 users were asked to rate "conflicts with other activities" and "reckless behavior of trail users" on a 7-point scale where "1" represented "not a problem" and "7" represented "a major problem." The mean response was less than 2 on each trail for "conflicts with other activities" and ranged from 1.5 to 2.8 for "reckless behavior of trail users."<sup>2</sup>

Nonetheless, user conflict can have a negative effect on the overall experience of trail users. The report cites 12 principles that can help improve sharing and cooperation on multiple-use trails.

*Recognize conflict as goal interference.* Do not treat user conflict as an inherent incompatibility among different trail activities, but goal interference attributed to another's behavior.

*Provide adequate trail opportunities.* This will help reduce congestion and allow users to choose the conditions that are best suited to the experiences they desire.

*Minimize number of contacts in problem areas.* Disperse use and provide separate trails where necessary after

### Railbanking

In the early 1980s, Congress became concerned about the dramatic decline in the nation's railroad infrastructure. Through an amendment to the 1983 National Trails Systems Act, Congress created a "railbanking" program to preserve abandoned rail corridors for future transportation use by encouraging interim conversion to trails. Under this act, if the railroad decides to re-establish rail service, the trail managing agency is entitled to compensation from the railroad, in most cases at fair market value for the property.

By the end of October 1998, 1,003 rail-to-trail conversions had been completed in the United States, accounting for 10,339 miles of trails. In 1996, 100 million Americans used rail-trails, including bicyclists, walkers, runners, in-line skaters, people in wheelchairs, cross-country skiers, equestrians, and other outdoor enthusiasts.

Source: Jeff Allen and Tom Iurino, *Acquiring Rail Corridors: A How To Manual* (Rails-To-Trails Conservancy in Cooperation with the National Park Service and The Trust for Public Land, 1996); Fact Sheet, Rails-to-Trails Conservancy, October 1998, [www.railstrails.org](http://www.railstrails.org).



careful consideration of the additional environmental impact and lost opportunities for positive interactions this may cause.

*Involve users as early as possible.* Identify the present and likely future users of each trail and involve them in the process of avoiding and resolving conflicts as early as possible, preferably before conflicts occur.

*Understand user needs.* Determine the motivations, desired experiences, norms, setting preferences, and other needs of the present and likely future users of each trail.

*Identify the actual sources of conflict.* Help users to identify the specific tangible causes of any conflicts they are experiencing.

*Work with affected users.* Work with all parties involved to reach mutually agreeable solutions to these specific issues.

*Promote trail etiquette.* Minimize the possibility that any particular trail contact will result in conflict by actively and aggressively promoting responsible trail behavior.

*Encourage positive interaction among different users.* This can be accomplished through a variety of strategies such as sponsoring “user swaps,” joint trail-building or maintenance projects, filming trail-sharing videos, and forming trail advisory councils.

*Favor “light-handed management.”* Intrusive design and coercive management are not compatible with high-quality trail experiences.

*Plan and act locally.* Be sensitive to local needs and address issues on a case-by-case basis.

*Monitor progress.* Conscious, deliberate monitoring is the only way to determine if conflicts are indeed being reduced and what changes in programs might be needed.

For a thorough review of the potential for conflicts among the different types of trail users, as well as conflicts between trail users and the natural environment, see *Conflicts on Multiple-Use Trails: Synthesis of the Literature and State of the Practice*, sponsored by the U.S. Department of Transportation’s Federal Highway Administration (FHWA) and the National Recreational Trails Advisory Committee. Although the report states that most trail users find their experiences enjoyable and satisfying, it also describes conflicts among users on multiple-use trails as a major concern that needs resolution by trail planners and managers (see <http://www.bikefed.org/PDF/Conflicts.pdf>).

For example, before the Wilson Centennial Trail opened in the Jackson, Wyoming, area, trail developers launched an educational campaign to head off anticipated problems from mixed use of the trail. Expectations of what was permissible on the trail were

## Accessibility

Since 1992, following passage of the Americans with Disabilities Act, new and altered trails must provide access to person with disabilities. The Architectural and Transportation Barriers Compliance Board (Access Board) is developing specific guidelines to interpret the law. The proposed guidelines are posted on the Access Board’s Web site, [www.access-board.gov](http://www.access-board.gov), under the Recent Updates link: Accessibility Guidelines for Outdoor Developed Areas.

These guidelines take into account the wide variety of trails and whether trails are under private or public ownership and whether they are new. The extent of rugged natural features on a trail is also considered.

A side-by-side comparison of the Access Board’s specific guidelines with those of the American Association of State Highway Transportation Officials (AASHTO) is presented in the appendix to the guidelines.

Before making the guidelines a final rule, the Access Board is inviting public comments.

## Separating heels and wheels

Officials overseeing the reconstruction of the 6.2-mile path in St. Louis’s Forest Park sought a solution to congestion and mixed-use problems. On the existing 10-foot-wide path, passes sometimes exceeded 400 per hour. To alleviate this congestion, separate paths for “heels” (joggers and pedestrians) and “wheels” (cyclists and skaters) are being constructed. The heel users’ surface is a rolled crushed stone in resin surface, the wheel users have asphalt. Each path will be 10 feet wide and a grass median will divide them except where they are joined for bridge and street crossings.

set from the beginning, and signs listing the rules of the trail were clearly posted to reinforce the message. Police who patrol the path on bicycles have reported few incidents.

**Crime.** When asked about crime problems on their trails, all city managers and trail officials interviewed for this report responded that crime was not a significant problem. The level of crime reported on or near the trails was no higher than that of neighboring parks. When abandoned right-of-ways are converted to public trails, the risk to adjoining properties may actually decrease since lawful trail users are likely to report anything out of the ordinary.

To increase the security of trail users, planners can consider landscape and structure design that allows clear sight paths and provide emergency phones. Volunteer trail rangers or even regular police patrols are other options to be considered.

### The Pinellas Trail Rules

The following rules governing the Pinellas Trail are posted at major access points and are included in the trail guides available to trail users at kiosks along the trail.

- The trail is only open during daylight hours.
- Alcoholic beverages are prohibited.
- Pedestrians and handicapped always have the right of way. Wheelchairs should use the pedestrian lanes and yes, electric handicap wheelchairs are always permitted on the Pinellas Trail.
- Bicyclists are required to obey all traffic controls and signals (Florida law). It's also the law that bicyclists are not permitted to wear headphones at any time—and bicyclists under 16 MUST wear a helmet at all times.
- Bicyclists and skaters should obey the posted speed limits. No racing (or race training pacelines) on the trail.
- Skaters should use the bicycle lanes, and both skaters and cyclists should give an audible warning when passing others.
- Of course, motorized vehicles (except electric handicap wheelchairs, and maintenance, law enforcement and emergency vehicles) are not allowed on the trail. Neither are horses.
- Pets must be kept on a maximum 6-foot leash and under control.

### FUNDING

Trails and greenways can be paid for with federal, state, county, and municipal funds, as well as contributions from nonprofit organizations, private businesses, and individuals.

#### Transportation Equity Act for the 21st Century (TEA-21)

To help communities attain social, cultural, aesthetic, economic, and environmental goals, every state must reserve at least 10 percent of its federal surface transportation funds for designated “transportation enhancement activities.”

Through 2003, the federal government will provide approximately \$620 million in transportation enhancement funds to state transportation agencies each year. These agencies are required only to set aside these funds, not commit them. In all 50 states and the District of Columbia, the program relies on communities and local governments to propose projects that would use these funds. State transportation agencies select from these proposals according to regional and state planning and funding priorities. Applicants for selected

projects become project sponsors, and they work with the transportation enhancement coordinators at state and federal transportation agencies until the projects are completed.

Federal and state rules govern the use of federal funds. The federal government provides states with interpretive guidance and ensures their compliance with all federal laws associated with the funds. As with other federal funding, the federal government typically pays for 80 percent of project costs. The project sponsor—a state, a local government, or a nongovernmental organization—pays the balance.

To qualify for TEA-21 funds, a project must have a strong relationship to the transportation network. The following are among the transportation enhancements that are eligible for funding:

- Pedestrian and bicycle facilities (for example, new or reconstructed sidewalks, walkways, or curb ramps); bike lane striping, wide paved shoulders, bike parking, and bus racks; off-road trails; bike and pedestrian bridges and underpasses
- Education activities that encourage walking and bicycling or promote pedestrian and bicycle safety
- Acquisition of scenic or historic easements and sites
- Scenic or historic highway programs including designation signs and markers or corridor research and planning
- Landscaping and scenic beautification improvements such as street furniture, lighting, public art, and landscaping along travel routes, waterfronts, and gateways
- Historic preservation including access improvements to historic sites and buildings
- Rehabilitation and operation of historic transportation buildings, including rail trestles, tunnels, and bridges
- Conversion of abandoned railway corridors to trails; acquiring railroad rights-of-way; planning, designing, and constructing multi-use trails; developing rail-with-trail projects; purchasing unused railroad property for reuse
- Archaeological planning and research, including developing interpretive signs, exhibits, and guides.<sup>3</sup>

A National Transportation Clearinghouse financial summary has monitored the enhancement money chain since 1992. The total amount of federal funds available under the transportation enhancements program from 1992 through March 1999 was \$3.83 billion. Of the total funds available, \$3.25 billion (85 percent) was budgeted for projects by the state departments of transportation. So far, \$2.25 billion (58.8 percent) has been obligated. Obligations generally represent projects that are ready to go. Because the figure is cumulative, it represents completed projects as well.

Finally, of the total \$3.83 billion available, \$1.45

billion (37.9 percent), has actually been reimbursed. The reimbursed amount includes funds spent on completed projects and completed portions of projects.<sup>4</sup>

The manner in which the enhancement funds are released is decided by the transportation department of each state. The application process for enhancements funds may be similar or identical to the process used when applying for federal highway funds. For example, the Colorado Department of Transportation annually receives its share of federal enhancement funds. It apportions that amount to its six regions based on the same apportionment used for highway construction funds. The department may keep some of the funds at the central office for statewide projects. The six regions process enhancement funding requests in the same way they process requests for federal highway projects.

Most states use selection criteria to evaluate enhancement proposals. For example, in Illinois, enhancement officials ask these kinds of questions:

- Is there a transportation relationship?
- How much public support does the project have?
- How much coordination has there been by the affected parties?
- Is the design thorough?
- Is there an aspect for economic development?
- Does the plan fit in with other characteristics of the area?
- Does the plan extend existing projects?
- Is there a past record of achievement?
- Are the rights-of-ways addressed properly?
- Will the project facilitate trip generators?

**Recreational trails.** Trails that have no direct transportation link may still qualify for federal funds through the recreational trails program first authorized in 1991 under the Intermodal Surface Transportation Equity Act (ISTEA) and reauthorized in 1998 under TEA-21. The recreational trails program provides funds to the states to develop and maintain recreational trails and trail-related facilities for nonmotorized and motorized uses such as hiking, bicycling, in-line skating, horseback riding, crosscountry skiing, snowmobiling, off-road motorcycling, all-terrain vehicle riding, four-wheel driving, and driving other off-road motorized vehicles.

The recreational trails program is an assistance program of FHWA. Each state administers its own program, usually through a state resource or park agency. Each state develops its own procedures to solicit and select projects for funding. Each state has a state recreational trail advisory committee to assist with the program.

States must use 30 percent of their funds for motorized trail uses, 30 percent for nonmotorized trail uses, and 40 percent for diverse trail uses.

**Congestion mitigation and air quality improvement (CMAQ).** Funding for this program began under ISTEA and has continued under TEA-21. The funding was established to help states and metropolitan planning organizations achieve the clean air goals set by the Clean Air Act amendments of 1990. The primary focus has been to provide financial assistance to those states that have not attained the prescribed levels for carbon monoxide, particulate matter, and the precursors of ozone—nitrous oxide and volatile organic compounds.

Bicycle and pedestrian facilities are eligible for CMAQ funds. In the first two years of the CMAQ program, bicycle and pedestrian projects received \$29.9 million, or 3.1 percent of total CMAQ funding. The types of projects vary greatly: among them are bikeway striping, bicycle/pedestrian signal installation, sidewalk construction, bike racks on buses, rails-trails, bicycle route signage, pedestrian overpasses, bike lanes, walkways, bicycle network planning, trail underpasses, bicycle storage improvements at transit centers and park-ride lots, and multi-use trails.<sup>5</sup>

To receive CMAQ funding for a project, a state must present a documented analysis demonstrating that a project will reduce emissions.

**Safety set-aside.** The TEA-21 safety set-aside, a total of 10 percent of surface transportation program funds, comprises the hazard elimination and railway/highway crossing programs and is the biggest source of untapped funding for bicycle and pedestrian improvements in the TEA-21 legislation. In fact, programs that address hazardous conditions for bicyclists and pedestrians on public highways or trails, and the programs

### TEA-21 funding

Under the Transportation Equity Act for the 21st Century, trail development projects are eligible for funding from at least 12 different programs:

- Transportation enhancement activities
- Recreational trails program
- “Core” surface transportation program
- Congestion mitigation and air quality improvement program (CMAQ)
- Federal lands program
- Scenic byways program
- Highway safety program
- Bridge program
- National highway system
- Transit enhancements
- Transportation and community and system preservation pilot program
- High priority projects.

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implementing safety-related traffic-calming measures are eligible for a pot of money the same size as the transportation enhancement program.<sup>6</sup>

### Local Funding

To fund a trail directly or to match federal or state money, local governments may raise funds through property taxes or bond issues. In Pinellas County, Florida, residents voted to adopt a one-cent sales tax increase. The tax increase reaped an additional \$5 million for the Pinellas Trail.

Funds from the impact fees on residential, industrial, and commercial development projects can be used for developing public improvements like open space and trails.

A number of nonprofit organizations, including the Trust for Public Land, The Nature Conservancy, and the Open Lands Project, work with states and regional and local governments to develop financing for acquisition or preservation of green space. In addition, at least 13 states have created funding programs to give money directly to nonprofits to acquire, plan, and steward land projects. Such programs exist in California, Connecticut, Delaware, Florida, Iowa, Maine, Maryland, Michigan, New Hampshire, New Jersey, Rhode Island, Vermont, and Wisconsin. Local governments can contact their state department of natural resources for more information.

### Public-Private Cooperation

Although it is obvious that rail-trails are great recreation areas, few people realize that almost 40 percent of them double as corridors for utility lines, pipes, and cables.<sup>7</sup>

A growing source of trail development funds is the leasing of subsurface rights for fiber-optic cables and other utilities. Compatible “joint uses” of a rail-trail corridor include sewer, water, and natural gas. Utility companies sometimes buy abandoned corridors and then donate the land to the state department of natural resources for trail use. Abandoned corridors can provide key links for utility use. Cooperation with local utilities can help pay for trails.

The Northern Central Rail-Trail in Gunpowder Falls State Park, Maryland, is an example of public-private cooperation in sharing a corridor. In the early 1990s, MCI Corporation was searching for a route to lay its new fiber-optic lines in an area north of Baltimore. At the same time, the state park’s master plan included a rail-to-trail conversion for the unimproved, abandoned railroad corridor. MCI proposed doing the conversion for the eight miles of the trail that would carry its fiber-optic lines.

The Maryland Department of Natural Resources did the planning and design work and developed construction specifications. Following these specifications, MCI contracted the work, which included repairs to bridges, correction of previous drainage problems,

grading, application of crushed stone, and compaction through rolling. MCI replanted vegetation along the trail and left no trace of its line, which was buried approximately three feet below the surface. The fiber-optic line is virtually maintenance free.

In another example, public-private cooperation provided an innovative solution to a demand for parking for trail users. Where the Pinellas Trail passed near a shopping mall, mall officials built a bridge to connect the mall’s parking lots to the trail. Many trail users gained convenient parking access to the trail; others were provided with a convenient link to the shopping mall.

## ECONOMIC IMPACT OF TRAILS AND GREENWAYS

A major 1992 study of three rail-trails by the National Park Service showed that the total economic impact of a trail involves the creation of new trail-related jobs and the expansion of existing businesses related to travel, equipment, clothes, food, souvenirs, and maps.

The study found that the average user of the Heritage Trail in rural Iowa spent \$9.21 per day. The figure for Florida’s Tallahassee–St. Marks Trail was \$11.02, and for urban California’s Lafayette-Moraga Trail, \$3.97. Each of the three trails was used by tens and hundreds of thousands of people, and the total economic benefit for each ranged from \$1.2 million to \$1.8 million per year. In 1993, Americans used rail-trails 85 million times. Not surprisingly, communities that have responded to trail users have profited generously.<sup>8</sup> According to a recent study of Maryland’s Northern Central Rail-Trail, the trail’s management and maintenance cost to the public in 1993 was \$191,893; the trail-related tax income to the state totaled \$303,750.

An economic impact study of the Allegheny Trail system in Pennsylvania found that the average spending per person per trip ranged from \$12.01 to \$15.23. Spending in Ohio, the trailhead community, was highest (ranging from \$19.54 to \$21.72 per person per trip) and West Newton spending was the lowest (ranging from \$6.39 to \$8.66 per person per trip). In general, bike users spent more than nonbike users. The study also found that a 10 percent increase in the distance traveled by trail users would result in a 4.2 percent increase in spending per person per trip.<sup>9</sup>

## CONSTRUCTION

### Engineering Guidelines

In June 1999, the American Association of State Highway and Transportation Officials (AASHTO) published the *Guide for the Development of Bicycle Facilities*, which sets out its engineering judgments as guidelines for the construction of paths. Some states have adopted as part of their standards the recommendations in the guide,

but the AASHTO guidelines are not intended to be standards themselves.

The guidelines suggest a 10-foot-wide and 4-inch-deep asphalt path on top of an aggregate base 6 inches deep. In rural areas a surface less than 10 feet wide may be justifiable. A 2-foot clearance on each side is recommended as a shoulder for an escape space. The shoulder should be rideable, and grass is acceptable.

The AASHTO guidelines contain a chart that recommends sight distances for different speeds. The chart also shows certain cases in which signs are recommended for curves. There is a table with recommendations for acceptable slopes. The crucial factor is the length of the grade. An 8 percent slope is acceptable for short distances. The 2 percent cross-slope for ADA is included. No specific load-bearing recommendations are made, but load bearing should be based on the type of vehicles, such as maintenance and emergency vehicles, that may use the path.<sup>10</sup>

### Maintenance Costs

The Minneapolis parks and recreation board budgets \$3 per foot per year for trails (\$15,840 per mile per year). Sweeping, painting, lighting, trash removal, snow and ice removal, and some policing are included in the budget. The budget also includes periodic seal coating, but not milling or replacement for the 8-foot-wide asphalt surfaces.

The Minneapolis park board manages trails in a variety of conditions. Some trails were built with generous budgets and they have bases that are more solidly constructed and no trees near the asphalt. The trails built with more limited initial funds require more repairs for weak spots and damage caused by tree roots. Given the winter conditions of freezing and thawing, the park board plans an average lifespan of 15 years for its trails.

The Path Foundation in Atlanta believes that building the highest quality trail possible is the most cost-effective strategy in the long run. Aided by extensive voluntary contributions from a local concrete company, the foundation has constructed 12-foot-wide, 5-inch-deep concrete trails. Approximately 65 percent of the foundation's 30 miles of trails are maintained through a contract with a company that services the trail bi-weekly, blowing, cleaning, emptying trash, mowing, fertilizing, and trimming trees. The fee for the contracted work is \$3,650 per month, or \$2,250 per mile per year. Other sections of the trail are maintained by adjacent property owners, and the occasional graffiti is removed by a group of volunteers. As the trails extend into outlying areas, the Path Foundation estimates maintenance costs at \$8,000 per mile per year. The initial cost of the concrete trails is approximately double the cost of a standard asphalt trail, but the concrete is expected to remain in good condition for at least 50 years.

The St. Louis County Parks and Recreation Department oversees 12 miles of trails. Maintenance is calcu-

lated to be \$12,300 per mile per year, including mowing, tree trimming, trash removal, and support for restroom facilities (including portable restroom rental). Maintenance of parking lots is included, as is an apportionment of managerial salaries. Mowing and weed removal equipment is included through amortization. There is no snow removal and repairing the surface is not included. St. Louis plans to seal coat the surface approximately every five to seven years and mill the top two inches and lay new asphalt every ten years.

### Alternative Sources of Labor

Working with state governments, the National Guard sometimes supplies labor to help build public trails. For example, the Army National Guard of Connecticut and Rhode Island assisted with the construction of a 54-mile section of the Washington Secondary Railroad Corridor. This participation was the result of the National Guard's Innovative Readiness Training program. By using their equipment to accomplish tasks that serve communities, the guardsmen gain valuable training experience. On the Connecticut portion of the corridor, the Connecticut Army National Guard followed the planning and design specifications of the Connecticut Department of Environmental Protection.

The combined forces of the Connecticut and Rhode Island National Guard moved 1,300 tons of debris from the abandoned rail corridor. They cleaned up garbage and dumped objects, as well as overgrown trees and bushes. In addition to removing debris, the guardsmen graded and applied crushed stone. They also removed a deteriorated bridge and built two bridges. They were compensated through their regular active duty pay.

Also as part of the Innovative Readiness Training program, the South Dakota Army National Guard contributed its resources toward the rail-to-trail conversion of the 114-mile George S. Mickelson Trail. Guardsmen reconstructed bridges, graded the trails, applied crushed limestone, and rolled the trail surface.

The U.S. Coast Guard Academy in New London, Connecticut, helped construct a local trail and as part of their engineering education, cadets also designed and constructed a bridge for the trail. Boy scouts in Connecticut have also contributed to the state's trails by building benches and signs.

In an example of public-private cooperation, administrators of the TrailNet system in the greater St. Louis area benefit every year during AT&T Cares Week when AT&T employees help trail managers clean up the area's trails.

### CONCLUSION

When asked why a city or county would want to build a trail, the city manager of Mountain View, California, responded with four reasons:

- A trail conserves open space.

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- A trail separates the walking and cycling public from traffic patterns.
- A trail provides corridors for commuters and others using the trail for transportation.
- A trail provides a public health opportunity to citizens through exercise.

The growing popularity of cycling and walking and incentives supplied by federal legislation explain the increased demand for the construction of trails and greenways. These trends suggest a continued increase in the number of trails and their wide acceptance by the public.

Americans are embracing the opportunity to enjoy a wide variety of social activities as well as improve their health in the open air. Like recreational use of trails and greenways, transportation use is also on the rise. When given a reasonable choice, the public prefers to avoid traffic congestion and decrease vehicular emissions.

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3. National Transportation Enhancements Clearinghouse, Enhancements Overview, [www.enhancements.org](http://www.enhancements.org).
4. National Transportation Enhancements Clearinghouse, Summary of Nationwide Spending: FY1999 Interim Report, Table 1, August 1999.
5. National Bicycle and Pedestrian Clearinghouse, Technical Assistance Series, Number 4, December 1995.
6. "Other TEA-21 Programs, Projects Get Rolling," National Center for Bicycling and Walking, [www.bikefed.org](http://www.bikefed.org).
7. Fact Sheet, Rails-to-Trails Conservancy, [www.railstrails.org](http://www.railstrails.org).
8. Fact Sheet, Rails-to-Trails Conservancy, [www.railstrails.org](http://www.railstrails.org), Analysis of Economic Impacts of the Northern Central Rail Trail," Maryland Greenways Commission, June 1994.
9. "An Economic Impact Study for the Allegheny Trail Alliance," Pennsylvania Economy League, Inc., and Stephen Farber, January 1999.
10. *Guide for the Development of Bicycle Facilities*, The American Association of State Highway and Transportation Officials (AASHTO), June 1999.

## ADDITIONAL RESOURCES

### Organizations

For expertise on a variety of issues relating to trails and greenways, readers may contact the following organizations.

**Center for Livable Communities (CLC)** A project of the Local Government Commission, the CLC helps local governments and community leaders be proactive in their land use and transportation planning; it

promotes programs and policies that lead to more livable land use patterns. [www.lgc.org/clc](http://www.lgc.org/clc)

**National Center for Bicycling and Walking (NCBW)** Formerly the Bicycle Federation of America, NCBW is a national, not-for-profit organization that works with people in communities to make communities more bicycle friendly and walkable. The resource center provides updates, information and resources for bikers and pedestrians, professionals in fields related to biking and walking, and citizen advocates. [www.bikefed.org](http://www.bikefed.org)

**Rails-to-Trails Conservancy** The conservancy is a 13-year-old nonprofit organization dedicated to creating a nationwide network of public trails from former rail lines and connecting corridors. Among other resources, it offers *Secrets of Successful Rail-Trails: An Acquisition and Organizing Manual for Converting Rails into Trails*, a 178-page guide for local trail planners and managers. [www.railstrails.org](http://www.railstrails.org)

**Trails and Greenways Clearinghouse** The clearinghouse provides technical assistance, information resources, and referrals to trail and greenway advocates. Services are free and available to individuals, government agencies, communities, grassroots organizations, and anyone else who is seeking to create or manage trails and greenways. [www.trailsandgreenways.org](http://www.trailsandgreenways.org)

### Publications

*Guidebook on Methods to Estimate Nonmotorized Travel: Overview of Methods*, published by the Federal Highway Administration, presents detailed descriptions of various means of estimating bicycle volume, pedestrian volume, or combined volume. The guidebook is available under "G" in the library section of the FHWA's Turner-Fairbank Highway Research Center's Web site: [www.tfhrc.gov](http://www.tfhrc.gov).

*The National Bicycling and Walking Study*, sponsored by the U. S. Department of Transportation, uses a series of cases to analyze the factors that affect the volume of bicycling and walking for transportation purposes. The study is available on the Internet at [www.bikefed.org](http://www.bikefed.org).

*Secrets of Successful Rail-Trails: An Acquisition and Organizing Manual for Converting Rails into Trails*, published by the Rails-to-Trails Conservancy, is a 178-page guide for local planners and managers that draws on the experience of more than 500 existing rail-trails, and includes specific case studies and numerous appendices with key contacts in each state.

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