



# Improving Conditions for Bicycling and Walking

## A Best Practices Report

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**by Rails-to-Trails Conservancy  
and the Association of Pedestrian  
and Bicycle Professionals**

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By John C. Fegan



# foreword

ENCOURAGING MORE PEOPLE TO WALK AND BICYCLE, AND TO DO SO SAFELY, INVOLVES ACTIONS AT FEDERAL, STATE, AND LOCAL LEVELS. THE INTERMODAL SURFACE TRANSPORTATION EFFICIENCY ACT OF 1991 (ISTEA) PROVIDED BROAD ELIGIBILITY TO USE FEDERAL FUNDS FOR THESE PROJECTS.

However, ISTEA did not guarantee Federal funding. Instead, pedestrian and bicycle projects have had to compete with all other transportation projects for limited amounts of available funding. Decisions on which projects are funded are made at State and metropolitan levels of government. In addition, State and local funding sources are also used to provide projects for walking and bicycling. Therefore, providing funding for these projects is a concrete illustration of the value of walking and bicycling to these communities.

This “best practices” report provides information on some outstanding pedestrian and bicycle projects that have been recognized for increasing walking and bicycling and improving user safety in communities across the United States. We have certainly overlooked other “best practices” in other places. Our intent was to highlight exemplary projects and to show what has been done that can be replicated in other places. We hope that by seeing what others have done, you will be inspired to create your own programs to encourage more and safer walking and bicycling in your own community.

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By Mia Birk, City of Portland

# portland, oregon

## CITY OF PORTLAND—A TOTAL COMMITMENT TO BICYCLING

**Portland, OR is considered one of the country's most bicycle-friendly cities.** Half a million residents live in the City of Portland (over 1.2 million in the Portland Metropolitan Region), surrounded by hills, farms, and forests. Its climate is mild, with an average 1,000-1,250 mm (40 to 50 inches) of rain falling between October and June. Portland's hills, rain, and rising levels of traffic congestion are indeed impediments to bicycling. Yet, in October 1995, it was selected by Bicycling Magazine as the most bicycle friendly large city in the United States. How did it get there?

In large part, Portland's success is due to a long-standing commitment to improving the bicycling environment. As early as 1971, Oregon's leaders adopted State law ORS 366.514, requiring cities and counties to spend a minimum of one percent of transportation revenues on bikeways and walkways and include bikeways and walkways as part of roadway construction and reconstruction. Currently, Portland spends between four and 12 percent of its annual transportation budget on bicycle-related projects and maintenance.

In 1973, Portland's first Bicycle Plan was developed by a residents' task force. This effort led to the creation of the City's Bicycle Program—one of the country's oldest. Voluntary citizen representation was maintained through a Bicycle Advisory Committee, a group of residents appointed by City Council to advise on all matters related to bicycling. Portland has also benefited from the organized advocacy efforts for the past 10 years of the Bicycle Transportation Alliance. Its efforts have led to increased government and public awareness and support for bicycle issues.

Today, the bicycle is a key means of transportation for thousands of Portland residents and a desired means of transportation for many thousands more. Over half of Portland residents own a bicycle and ride at least occasionally. Bicycle use is rising rapidly. Overall, the bicycle share of trips is about two percent in Portland, rising to 3.3 percent of trips in the inner, more dense areas of town. For example, while only 200 cyclists per day were recorded on the Hawthorne Bridge in 1975, by 1997 this number had climbed to over 2,200. Similar increases have been documented at numerous locations throughout the City.

Many aspects of Portland encourage bicycle use. The City has installed over 320 km (200 miles) of bikeways —bicycle lanes, bicycle boulevards, and off-street paths. Over 80 km (50 miles) have been added in just the last two years, while an additional 40 to 50 km (25 to 32 miles) are planned annually. In addition, Portland maintains the integrity of the bikeway network through regular maintenance as well as responding to hotline, web page, and postcard requests. Portland has installed loop detector markings to assist bicyclists in activating signals; replaced or retrofitted many of its dangerous grates; and trained staff throughout the City's agencies to look for potential bikeway improvements.

Cyclists park at over 3,000 publicly-installed bicycle parking spaces or rent longer-term space at one of 250 bicycle lockers. The City code was recently modified to require new and reconstructing buildings to install both short- and long-term bicycle parking. Bicycle commuters can also take advantage of five "Bike Central" stations (providing showers, changing facilities, and long-term bicycle storage).

The City annually distributes free bicycle maps and safety information to over 10,000 residents and helps to sponsor numerous community bicycling events.



Portland, OR

City of Portland—A Total Commitment to Bicycling

A commitment toward bicycling by its regional partners, including the Oregon Department of Transportation (ODOT), Metro (the regional government), and the neighboring counties (Clackamas, Multnomah, and Washington) also contributes to an improving bicycling environment. ODOT has been working to place bicycle lanes on its streets running through Portland. Metro has been leading an effort to ensure that future land-use development encourages balanced transportation options, including bicycle transportation. The three neighboring counties have adopted bicycle master plans and are working with Portland to ensure that bikeways are connected. Another key regional partner is Tri-Met (the local transit system), whose entire bus fleet is equipped with bicycle racks, and who allows bicyclists on the light rail train (MAX). There are over 80,000 bicycle trips on MAX or bus annually.

In addition, many organizations and businesses offer their energy and commitment to improve the bicycling environment. Portland's Parks Bureau and Metro's Greenspaces Program are installing dozens of kilometers of off-street paths, such as the Springwater corridor and Eastside Esplanade. More than three dozen bicycle shops provide crucial services to Portland cyclists. There is an impressive array of advocacy, education, and riding groups, including the Bicycle Transportation Alliance (sponsor of the annual Bike Month), Kaiser Permanente's Injury Prevention Program, Portland United Mountain Pedalers, and Portland Wheelmen Touring Club. The Portland Police Bureau and the Office of Transportation's Parking Patrol use bicycles, as do some of Portland General Electric's meter readers.



Finally, a diverse coalition of educators, administrators, bicycle advocates, and government agencies are working to make bicycling a more



Portland: Bikes on Buses

viable and safe option for children. These efforts include the Office of Transportation's Traffic Calming Program (installing speed humps and signal beacons around schools), Community Traffic Safety Program (Kids on the Move safety curriculum, For Kids' Sake Slow Down campaign, and bicycle safety workshops), and Bicycle Program (installing bicycle racks at, and bikeways to, schools). Others involved include Portland Public Schools, parents, educators, the Community Cycling Center (teaching children bicycle safety, repair, and riding skills), and numerous groups working to increase helmet use.

While Portland has a tremendous amount of community support and momentum, it still has a long way to go to be truly bicycle-friendly. Its Bicycle Master Plan (adopted May of 1996), presents the blueprint for the future: a 1,000 km (630 mile), well-maintained bikeway network; short- and long-term bicycle parking at every cyclist destination; full integration with transit; and comprehensive bicycle safety education for all residents. The realization of this vision is intended to achieve a 10 percent mode share and a dropping bicycle-motor vehicle crash rate. Portland is totally committed to making bicycling an integral part of daily life.

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# davis, california

## DAVIS, CA: A BICYCLE FRIENDLY CITY

**In Davis, CA the city logo is a bicycle**, more than 20 percent of trips are made by bicycle, there are no school buses (everyone walks or bicycles to school) and the local micro brewery brews a “bicyclists beer”. Many consider Davis, population 55,000, to be the most bicycle friendly city in the United States.

Bicycle lanes are striped on 56 km (35 miles) of the city's 170 km (107-mile) street network. There are another 56 km (35 miles) of separated off-road trails and bike paths, sometimes paralleling the city's major roads but more often extending beyond the highway system. As an example, the campus of the University of California at Davis is highly accessible by bicycle on a system of trails that has all but replaced roads. Eleven grade-separated intersections carry the trail system over or under major highways throughout the city. The result is that more than 80 percent of the major roads (arterials) in the city have either a parallel path or striped bike lane, making bicycle travel safe enough for all ages.

The City and University authorities have worked together closely to plan, develop and maintain the bicycling infrastructure. All new developments are required to incorporate bicycling provisions: new buildings must have bicycle parking; new roads must have space for bicyclists; and housing areas must be connected to the bicycling network and to each other with short sections of trail. Over the course of 35 years, building bicycling into the fabric of the city has become the norm.

Davis also boasts a number of interesting and unique features and with thousands of bicyclists in such a small area the city is something of a laboratory. For example, you can see almost every conceivable type of bicycle parking device — and the way it is used or abused — somewhere in the city.

**Bike lanes:** the city has bike lanes on streets with and without on-street parking, and on all classifications of street. The bike lanes are typically at least 1.5 meters (five feet) wide, and often wider to allow



Davis, CA

cyclists to ride two-abreast or to pass each other. Shared parking and bike lanes are usually 5 meters (15 feet) wide and the corners of the car parking stalls are marked with white paint. There are numerous intersections where right-turning traffic is placed to the right of the bike lane — allowing straight-ahead bicyclists to avoid conflict with turning cars.

**Roundabouts:** the trail system on the UC Davis campus carries huge volumes of bicyclists, especially between classes and at the start and finish of the school day. Traditional intersection designs were insufficient to cope with the volume and so roundabouts were installed at the busier locations.

**Bicycle-sensitive traffic signal detectors:** bicyclists in Davis rarely have to worry about traffic signals detecting their presence. Bicycle sensitive loop detectors are installed at most signalized intersections and at some the “best” place for bicyclists to stop is shown with a white painted bicycle symbol. These are commonly used where bicycle lanes are located between the through- and right-turning traffic lanes.

**Bicycle Traffic Signals:** one major intersection on the edge of the university campus has peak hour flows of more than 2,300 cars and 1,100 bicyclists (and more than a few pedestrians) and in one two-year period there were 16 car-bike collisions. The city responded by installing traffic signals with special bicycle symbols and adding a 30-second “bikes only” phase in the signal timing. This time allows bicyclists to clear the intersection with minimum conflict and delays for everyone — and there were no reported crashes in the year following the experiment. The bicycle signals are now being used at six other locations around the city.

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## cold climates

### BICYCLING AND WALKING IN A COLD CLIMATE

**The northern city of Anchorage, AK** boasts of one of the most extensive urban trail systems in the nation. With more than 400 km (250 miles) of biking, hiking, skiing, dog sled, and equestrian trails within the city limits, Anchorage offers a multitude of trail choices for its 255,000 residents.

In 1996, the American Hiking Society recognized Anchorage as one of the top trail towns in the U.S. and the city is proof that a community does not have to be in the sun belt for its residents to enjoy the benefits of good trails.

Despite the city's northern climate with its short winter days and more than 1.5 meters (five feet) of snow each winter, Anchorage residents make full use of their trails year-round. A recent survey completed as part of the update of the area trails plan showed that nearly 50 percent of the population uses the trails in winter on a regular basis. "I don't think there's a whole lot of difference" between summer and winter use, said Parks and Recreation Department employee Pat Tilton, who sees the trails on a daily basis in his job. The city's Parks and Recreation Department maintains more than 35 km (22 miles) of trails for winter running and pedestrian use while nearly 22 km (14 miles) of the more heavily used trails are lighted.

After several years of attempting to plow and sand the trails each winter, the Parks and Recreation department bowed to the realities of the climate. The department now drags and packs several trails for Nordic skiers, winter joggers, mountain bikers, ski jorers, and dog sledders.

Indeed, Anchorage trails exemplify multiple use. Summer users range from the familiar bicyclists, hikers, in-line skaters, joggers, and along some trails, equestrians. After the snow flies in late October or early November the mix includes cross country skiers (both traditional and skate skiers), mountain bikers, joggers, dog sledders, and ski-jorers (cross-country skiers pulled by dogs in harnesses). A distinctive feature of the Anchorage trail system is the number of grade separated crossings of major highways. More than two-dozen over- and underpasses make it possible to travel for almost 32 km (20 miles) without crossing a road at street level. One of the newest overcrossings bends above Tudor Road, a five lane principal arterial, to provide the gentle sweeping turn required by dog teams and to miss some utility lines.

In 1973, there were fewer than 5 km (3 miles) of bike trail in the municipality. Today there are more than 400 km (250 miles) of trails. Most of the funding for the system came from State and municipal sources. A few matching grants from the Land and Water Conservation Fund helped on some segments. More recently, Federal transportation funds (ISTEA)

have been used to complete missing links and bridge major roads. Design work has begun on major extensions to the Tony Knowles Coastal Trail and the city's 1998 Transportation Improvement Program includes \$200,000 for a location study for a key north-south trail.

The key to Anchorage's success is "major community involvement from the beginning," according to Tilton, who participated in the first organizing bike ride in 1973. Other communities seeking to match Anchorage's achievements should develop a trails plan early on, he says. The plan should include appropriate standards for the community. For example, Anchorage's Trail Plan includes standards for dog sled trails as well as hiking trails. The plan should include a mechanism to protect trail corridors the community deems important. One of the duties of the Anchorage Parks and Recreation staff is to review proposed subdivision plats against the trails plan to ensure trail corridors are preserved.

Anchorage is living proof that trail activities needn't shut down with fall leaves. Some skeptics in northern communities may argue against putting money into trails because they can be used only part of the year. But Anchorage's experience is that climate is not a valid excuse. Anchorage trails are used year round and perhaps see a wider variety of users than trails elsewhere.



Anchorage, AK

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# oregon plan

## OREGON BICYCLE AND PEDESTRIAN PLAN

**The Oregon Bicycle and Pedestrian Plan**, one of the modal elements of the Oregon Transportation Plan, carries considerable authority as it establishes ODOT's policies regarding bicycling and walking. It sets construction standards for ODOT and offers guidance to local jurisdictions in establishing their bicycle and pedestrian networks.

### Section One: Policy and Action Plan

The first part of the document is a policy and action plan which has a clear vision statement: Oregon envisions a transportation system where walking and bicycling are safe and convenient transportation modes for urban trips.

The importance of these modes is explained from environmental, economic, and social perspectives. Other factors that influence walking and bicycling, such as land use, are mentioned to put the plan's goals in context.

The plan focuses on existing streets in urban areas, where short trips on foot or by bicycle are most common. Renovating existing streets with bikeways and walkways is emphasized, because these streets are already in place and serve community needs.

The goal is to provide safe, accessible, and convenient bicycling and walking facilities and to support and encourage increased levels of bicycling and walking. This goal will be implemented by the following action items:

#### Action 1:

Provide bikeway and walkway systems that are integrated with other transportation systems.

#### Action 2:

Create a safe, convenient, and attractive bicycling and walking environment.

#### Action 3:

Develop education programs that improve bicycle and pedestrian safety.

## The public involvement process

solicited hundreds of comments, most of which were considered and used in the final version.



A distinguishing feature of Oregon's plan is the recognition that the Actions will be implemented primarily through good road design. Transportation projects that are designed with consideration of pedestrians' and bicyclists' needs serve all users well. This is a different approach from the more traditional view of creating a network independent of roads and streets. Therefore, the bulk of the plan is a road design manual. It is the source of information for designers, planners, and citizens, when they want to build streets that accommodate nonmotorized modes.

### Section Two: Design

The design section establishes standards for safe and attractive bikeways and walkways. High standards are established so facilities do more than just accommodate current walkers and bicyclist: another goal is to attract new users. The plan is subdivided into the following sections:

**Planning Principles:** The planning of walkway and bikeway networks adheres to these principles:

1. Existing streets must be improved.
2. Arterials are important to pedestrians and bicyclists.
3. Obstacles must be overcome.
4. The biggest impediment to walking and bicycling is segregated land use that creates long distances between origin and destination.



## Oregon Bicycle and Pedestrian Plan

Other planning considerations such as public transit and access management are discussed. Appropriate types of facilities are explained, as well as techniques to overcome barriers to walking and biking (busy streets, freeway crossings, etc.).

**Design Principles :**

**Bikeway Design** presents the various types of on-road bikeways (shared roadway, shoulder bikeway, and bike lanes), as well as special considerations such as railroad crossings.

**Bicycle Parking** offers recommendations for cities to use in their local ordinances.

**Bike Lane Restriping** is an effective and inexpensive treatment for improving conditions for bicyclists on existing roads.

**Walkway Design** covers the basic urban walkway - sidewalks; standards are established to meet ADA requirements; other considerations such as bus stops and planting strips are presented.

**Street Crossings** are the greatest challenge to pedestrian mobility; improvements such as islands and curb extensions are discussed.

**Multi-Use Paths**, previously called "bike paths," serve pedestrians and other users. The opportunities and challenges associated with separated paths are presented.

**Intersections and Interchanges** present special challenges to users and designers, since most conflicts occur here; designs to improve bicycle and pedestrian safety are presented.

**Signing**—standardized signs and markings are proposed for State and local systems.

**Maintenance**—recommendations are presented that will enable ODOT, cities, and counties, to keep facilities in a usable condition.

**Safety Considerations**—the major causes of pedestrian and bicycle crashes are explored. Engineering, education, and enforcement solutions are offered.

**Bicycle Maps**—statewide standards for legends help cyclists pick a route anywhere in the State.

The plan contains close to 200 graphics and over 100 photos, to illustrate the designs. These can be used as overheads or slides for classroom presentations, or modified for use in other documents, such as local plans.

Since its publication in 1996, the Oregon Bicycle and Pedestrian Plan has been widely distributed in State and around the country and is in daily use by planners, designers, elected officials, and citizens. The Plan answers most of the questions fielded by ODOT bicycle and pedestrian program staff.

More than two years in the making, the plan was produced by the Bicycle and Pedestrian Program Manager in collaboration with the State advisory committee and ODOT's in-house graphics department. The public involvement process solicited hundreds of comments, most of which were considered and used in the final version. The total cost to produce the plan is estimated at \$40,000: \$20,000 in staff time, \$10,000 in graphics and lay-out, \$10,000 in printing.

**other examples**

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# birmingham

## BIRMINGHAM, AL AREA BICYCLE, PEDESTRIAN, AND GREENWAY PLAN

### **The main focus of the Birmingham Area Bicycle, Pedestrian and Greenway Plan**

is to establish the transportation value of bike-ways, sidewalks, and trails for Jefferson and Shelby Counties as an element of the Long-Range Transportation Plan. By creating routes which provide linkages to retail establishments, households, schools, recreational facilities, major employment centers and other destinations, bicycle and pedestrian projects can be justified and programmed for funding in the five-year Transportation Improvement Program (TIP).

Funding for the \$250,000 plan came from the Congestion Mitigation and Air Quality Improvement Program. Local match funds were provided by the Birmingham Regional Planning Commission (managing agency), the City of Birmingham, and Jefferson and Shelby Counties. The consulting team for the project included consultants who were nationally recognized in the field of bicycle and pedestrian planning and design as well as local planning and design firms with experience in greenway planning.

One hallmark of the plan was extensive community participation. An Advisory Committee, established by the MPO to guide the project, included representatives of each participating agency, the Alabama Department of Transportation, local citizens, bicycle and pedestrian advocates, local developers, the Chamber of Commerce, and several local interest groups. In addition, numerous public meetings and workshops sought public input and a newsletter provided up-to-date information as the plan developed. A local advocacy group, the Pedestrian Bicycle Coalition (PBC), was created specifically to support the Plan and encourage its implementation. The

PBC has since incorporated and has become an active player in advocacy efforts and bicycle education programs.

A common problem with bicycle planning is the inability to assess current demand for facilities and current level of service provided by the existing street system. The Plan pioneered the use of several new engineering tools that address these needs — tools that are now being used in metropolitan areas throughout the country. The Latent Demand Score estimates the relative level of demand for bicycle travel along specific transportation corridors. The Bicycle Level of Service model was used to estimate current conditions for bicycling on area roadways and used to identify roadways where improvements are needed due to inadequate travel conditions for bicycles.

Implementation of the Plan is reflected in both the FY 1997 and FY 1998 Transportation Improvement Program (TIP). A continuing bicycle and pedestrian planning element has funded a planner to facilitate project development, establish safety programs in local schools, and develop a public awareness and education program. Seven off-road trail projects have been programmed by the MPO in the TIP at a total cost of \$7.2 million.

In summary, bicycle and pedestrian projects can be justified from a transportation perspective and included as part of an area's Long-Range Transportation Plan, making them eligible for traditional transportation funding.

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by Randy Neufeld and Ben Gomberg

# chicago plan

## PLANNING TO MAKE CHICAGO BICYCLE-FRIENDLY

**At seven pages, Chicago's Bike 2000 Plan,** looks extremely thin next to the many weightier bike plans produced under the Intermodal Surface Transportation Efficiency Act (ISTEA). Yet the impact of the plan is a model for other cities.

Chicago's post-auto bicycle program began in the mid 1950s with significant development of bike paths in parks including Chicago's crown jewel, the 29-km (18-mile) Lakefront Path. The most recent bicycle program renaissance began in 1990 with Mayor Richard M. Daley establishing a bicycle council. The Mayor's Bicycle Advisory Council became a showcase for the cooperative efforts of the City's Department of Transportation and the local bicycle advocacy group, the Chicagoland Bicycle Federation. The Council went right to work, starting projects while simultaneously writing a planning framework. This approach of developing the blueprints while building continues to energize Chicago's bicycle program.

The first projects of the Council included long-discussed Lakefront Path improvements; signed, named connecting street routes between trails; a bike map; and a parking rack demonstration at 13 municipal buildings. In the midst of these projects the Bike 2000 Plan was written. The purpose of the Plan therefore was not to figure out what to do first, but what to do next. In the middle of the drafting of the Bike 2000 Plan, Congress passed ISTEA, just in time to provide new funding opportunities for the proposed projects.

Mayor Daley announced the Bike 2000 Plan during Bike to Work Week in May 1992. In his speech, he was able to introduce not only the plan but also the bike racks and routes that had already been achieved. This set a pattern for annual progress reports. Every year at the Bike Week rally the Mayor reports on what has been accomplished in the past year.

The main goal of the Bike 2000 Plan is for 10% of all short (8 km (5 miles) and under) individual vehicle (single occupant) trips to be by bicycle by the year 2000. The Bike 2000 Plan contains 29 recommendations organized into Education, Encouragement, Engineering, and Enforcement categories. As of this writing there has been significant action on 28 items and the remaining one is under discussion.

Many of the important policy and network details that are included in more comprehensive bicycle plans such as Houston's or New York City's are only now being developed in Chicago. A comprehensive survey of off-street



Lakefront Trail, IL

trail opportunities with a focus on active and abandoned rail corridors was completed in 1997. A plan identifying an on-street network of bikeways and accordant implementation of policies will be completed in 1998. The latter will draw on lessons from the 1996 installation of 40 km (25 miles) of bike lanes.

In all of Chicago's most significant accomplishments, there is a common pattern. First, a small demonstration project is attempted usually using exclusively local funds. With experience, the project is modified and the successful components are expanded, usually with State and Federal funding. Starting small helps everyone gain experience with a proposed program and feedback develops ownership in a program. It is ultimately this broad based ownership that makes Chicago's bicycle program so vital. Political leadership, the city staff, and public interest groups work together for the success of the program and understand each other's interests.

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By Phil Miller, King County Roadshare Program

# king county trails

## KING COUNTY REGIONAL TRAIL SYSTEM

**King County, WA** is the provider of one of the largest trail systems in the United States. The King County Regional Trail System currently comprises nearly 320 km (200 miles) of improved multi-purpose trails. An additional 110 km (70 miles) of right of way are available within the public domain awaiting improvement, while about 95 km (60 miles) remains to be acquired. Ultimately, a system of nearly 650 km (400 miles) of facilities serving bicyclists, walkers, runners, equestrians, and a wide variety of other users is planned.

The regional trails comprise a significant element of King County's open space system, and connect urban areas with parks, valleys, mountains, and other communities. The trail system also is intended to provide routes for wildlife movement and to buffer natural areas from development.

### A Variety of Trails and Experiences

The King County Regional Trails System is notable for the variety of different rights of way used in its development. The County has been at the forefront of conversion of abandoned rail properties to trail use, both in the direct acquisition of lines such as that used in the Burke-Gilman Trail, to railbanking the Cedar River Trail (Milwaukee Road rail line) and others. The trail system makes extensive use of waterfront properties, preserving public access along river and lakefronts, while also seeking access along utility corridors, water pipelines, and other linear properties. Developer dedications have closed many gaps in the system, and many kilometers of trails have been added by local jurisdictions extending the benefit of the regional system into neighborhood trail networks.

The trail system is also notable in its growing stature as a regional nonmotorized transportation network. Working with the King County Department of Transportation, the Parks Department has been able to develop the core system to a standard which supports remarkable user volumes for commuting and other utilitarian trip purposes. Federal trans-

portation funding has enabled the County to focus development of specific corridors with particular potential for carrying commute traffic to destinations such as Boeing, the University of Washington, Microsoft, and to connections with the County's on-street bicycle network and regional transit. The Washington State Department of Transportation is investing significant resources to making freeway corridors accessible either through inclusion of trails within the right of way or by bridging the barriers created by freeway construction.

Some of the highlights of the regional trail system include the Burke-Gilman and Sammamish River Trails, which together allow one to travel from the Fremont neighborhood of Seattle to Marymoor Park in Redmond, 45 km (28 miles) away. The entire trail is paved and offers waterfront and water views of the Lake Washington Ship Canal, Lake Union, Lake Washington, and the Sammamish River. The trail covers everything from the urban landscape of Seattle to the University of Washington campus to the preserved farmlands of the Sammamish Valley.

Another popular trail is the Snoqualmie Valley Trail, which, when completed will stretch 58 km (36 miles) from Snohomish County to the north to the Cascade Foothills where the trail joins the Iron Horse Trail, a cross-state rail-trail extending through the Cascades to Idaho. The 29 km (18 miles) of crushed rock and compacted ballast trail that is completed allows exploration of one of the most beautiful valleys in Western Washington.

The Interurban Trail and the Green River Trail will eventually comprise a system of nearly 80 km (50 miles), ranging from the Seattle Waterfront to the southernmost areas of the County, utilizing riverfront levees and the abandoned route of the once-popular Seattle-Tacoma electric commuter railway. The Interurban currently serves a tremendous bicycle commuting population, and will again serve rail use by allowing bicyclists and pedestrians direct access to the Commuter Rail system currently planned to enter service in King County in 2002.

### Future Challenges

## The trail system

is also notable in its growing stature as a regional nonmotorized transportation network.

## King County Regional Trail System



I-90 Trail

The King County Regional Trail System and its development have set numerous precedents for other jurisdictions in the central Puget Sound region, Washington State, and nationally. As the system moves closer to fulfillment of its original vision, new issues and challenges are emerging which are pointing to new expectations from users and managers. These challenges include:

#### Local System Development

As growth and traffic impacts are increasingly being felt in the robust Puget Sound economy of the late 1990s, greater attention is being paid by neighborhood and community activists to the development of local and neighborhood trail systems. Usually, these systems are established “after the fact” requiring new approaches to right-of-way acquisition or management. Other challenges include assumption of liability, systematic dedication of right of way as part of the development review process, and effective retrofit of local systems to support both the regional trail system and local circulation needs.

#### User Mix

The planning of the regional trail system has sought to anticipate the need to accommodate an increasingly diverse set of users, with their accordingly different requirements for trail access, design standards, and features specific to particular user groups. While most of the system is intended to be paved, many if not most trail corridors contain parallel equestrian facilities, while rural trails leading to the mountains are being

prepared to accommodate larger tire bikes (mountain, cross, touring). While the Regional Trails Plan establishes long term expectations, trail managers and planners are seemingly always attempting to respond to the needs of emerging classes of users.

#### Appropriate and Consistent Regional

##### Application of Standards

As more communities develop trail plans and programs intended to support the Regional Trail vision, a problem recurs in inconsistent application of trail standards, design guidelines, and philosophies. King County uses AASHTO standards as a baseline for system development. Staff is often working with design consultants to maintain standards which emphasize safety and utility over landscape values. In the long term, efforts at the Puget Sound Regional Council (the local metropolitan planning organization) to provide an accepted regional standard are expected to alleviate the problem.

#### Summary—A Vision Fulfilled?

The development of the King County Regional Trails System has succeeded beyond the expectations of its founders, in that the system is part of the commonly and legally acknowledged transportation system of the County, and represents far more than linear green spaces. The trails define and connect communities throughout the County and have developed into one of the most significant indicators of a quality of life that continues to attract people to the Northwest.

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By Hugh Morris, Rails-to-Trails Conservancy

# capital crescent

## CAPITAL CRESCENT TRAIL

**The 18 km (11 mile) Capital Crescent Trail** connects downtown Washington, DC with the Montgomery County, MD suburbs of Bethesda and Silver Spring. Fourteen kilometers (9 miles) of the trail are paved and the remainder is surfaced with crushed stone.

The Capital Crescent Trail, an extraordinarily popular urban trail that is used by thousands of people every week for a wide variety of purposes, is a great success story because of both its instant popularity and for the way it came into existence.

The trail runs along a converted CSX spur rail line that, until the early 1980s, was used to deliver coal to a power plant in Georgetown, Washington, DC. After the trains stopped running, the lengthy process of turning the corridor into a trail began and after nearly ten years the first section of the trail was opened to the public. On weekday mornings, the long-awaited trail is primarily used by commuters and a few early-bird exercisers. After work, the path is more crowded with a mix of recreational users and commuters making their way home. On the weekends, the trail is so heavily used by walkers, runners, in-line skaters, and families pushing baby carriages that faster and more confident cyclists often avoid the trail altogether.

One reason for the relatively slow pace of development of this popular trail was the number of different agencies and jurisdictions involved. As CSX was preparing to abandon the corridor, Montgomery County amended its master plan to include use of the corridor in Maryland as a trail. In early 1988, the U.S. Army Corps of Engineers announced plans to develop a trail plan for the corridor, as the right-of-way runs through a reservoir over which they have jurisdiction. At the same time, the National Park Service (NPS) was being urged to support use of the corridor as a trail within the District of Columbia—NPS was involved because the corridor runs along the C&O Canal National Historical Park for several kilometers. However, all trail development activities were put on hold when, soon after the Interstate Commerce Commission (now the Surface Transportation Board) approved the railbanking of the line, a local businessman attempted to

Capital Crescent Trail, DC



purchase the corridor for continued rail service. Railbanking is a process by which unused rail corridors can be preserved for future use and used in the interim as a trail. Late in 1989, 29 adjacent land owners (unsuccessfully) filed suit claiming rights to the portion of the corridor abutting their property.

Throughout these setbacks, the project to turn the former rail line into a trail was kept alive by the Coalition for the Capital Crescent Trail, a citizen group founded in 1986. They organized clean-up days and walks along the corridor to increase awareness of the potential trail. Members worked with the NPS and Montgomery County to maintain agency support. The Coalition hired a campaign coordinator to persuade the County to buy its portion of the corridor for \$10.5 million in December 1988, and later to lobby Congress and the D.C. city council to approve the \$11 million needed to buy the corridor in the District.

## Capital Crescent Trail

In December 1991, the Intermodal Surface Transportation Efficiency Act (ISTEA) was signed into law, creating new Federal funding opportunities for trails. A revised trail plan was completed in May 1992, estimating development to cost \$1.6 million for the portion in Montgomery County. The County requested \$1.3 million in ISTEA funds and in September 1992 received a portion of this request for construction. The first section of trail opened to the public in December 1993 and additional funding for the trail was obtained from the Potomac Electric Power Company for an easement the utility holds in the corridor.

While 18 km (11 miles) of the trail are now open, the trail is not yet complete. The Coalition is pushing to extend the trail to downtown Silver Spring, MD, connecting it to the Metro subway station. There is even consideration of running a light-rail transit line along the corridor between Silver Spring and Bethesda — a good example of the value of railbanking in preserving corridors for future rail service.

Also at issue is a long tunnel in Bethesda, MD. The tunnel is currently closed, forcing trail users to leave the right-of-way for three blocks and use local streets. While opening the tunnel would minimize use of city streets, there are safety concerns about using the tunnel. The tunnel also would become an issue if light-rail is put in along the corridor — the tunnel is not wide enough for both rail and trail.

The trail is a critical link in more ways than one. Not only does it connect downtown D.C. with residential suburbs, but it also connects to the C&O Canal, a 300 km (185-mile) path from downtown Washington to the western edge of Maryland, and the Rock Creek Park Trail. Eventually, the Capital Crescent also will link into the Metropolitan Branch Trail and complete a ring of trails around the District of Columbia.



Capital Crescent Trail, DC

### publication

**"MILESTONES: 1986-1996, A CHRONOLOGY OF THE FIRST TEN YEARS."**

PRODUCED BY THE COALITION FOR THE CAPITAL CRESCENT TRAIL, P.O. BOX 30703, BETHESDA, MD 20824.

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### contact WILLIAM GRIES

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### other examples

**MINUTEMAN TRAIL**  
18 KM (11-MILE) RAIL-TRAIL CONNECTING THREE BOSTON SUBURBS TO THE MBTA'S ALEWIFE STATION.  
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DIRECTOR, PLANNING & COMMUNITY DEVELOPMENT  
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By Bob Patten, Rails-to-Trails Conservancy

# glenwoodcanyontrail

## GLENWOOD CANYON I-70 RECREATIONAL TRAIL

**As the Interstate era came to a close** in the 1980s, bicycle and pedestrian facilities were more frequently included in Interstate completion projects. Virginia DOT built the Custis Trail along I-66 in suburban Arlington, VA. Washington State DOT included a multi-use trail in its reconstruction of I-90 across Lake Washington and Mercer Island, and the I-90 tunnel which pierced the Mt. Baker neighborhood of south Seattle. And, as part of completing the final link of I-70, Colorado DOT built a concrete path beneath the red rock cliffs of Glenwood Canyon just east of Glenwood Springs, CO.

Today, cyclists, in-line skaters, and pedestrians can travel the 88 km (55 miles) from Glenwood Springs to Vail, in the heart of Colorado's Rocky Mountains, on a combination of on- and off-road paths. Some 21 km (13 miles) of this journey is possible because the \$500 million project to complete a four-lane interstate highway through Glenwood Canyon included \$50 million for three major mitigation measures: 1) construction of four rest areas; 2) planting more than 150,000 trees, shrubs, and grasses for revegetation; and 3) building a trail to maintain direct access to the banks of the Colorado River (more than 80 pullouts along the old Route 6 would be eliminated by the new highway).

The trail highlights just two of the many lessons that the Glenwood Canyon highway project has to teach regarding environmental design, innovative construction techniques, and public participation:

**1.** Incorporation of a trail often benefits the design and cost-effectiveness of the highway itself. Locating the trail along the retaining wall between the roadway and the river resulted in low cost, high performance

flood protection for the wall footings and highway itself—allowing spread footings to be used in place of the much more costly deep foundations because a rip-rap base and concrete trail overlay provided sufficient scour



### other examples

**I-66 IN VIRGINIA** (CUSTIS TRAIL):  
RITCH VIOLA, ARLINGTON COUNTY  
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**I-90 IN WASHINGTON** (I-90 TRAIL):  
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Glenwood Canyon I-70 Trail

protection. The only added cost created by the trail was providing periodic bridges over the many streams cascading out of canyon draws, and other finishing touches required by a trail as opposed to a simple erosion control structure.

**2.** Local citizen participation is essential for ensuring the highest quality product. A Citizens Advisory Committee (CAC) was convened to watchdog the entire highway project. All design developments had to be approved by the CAC before any final design or construction could commence. Completion of the trail remained a high priority for the CAC and they negotiated a compromise between experienced trail interests wanting a three meter (10 foot) path, and some design engineers and environmentalists seeking to minimize the whole projects footprint by providing only a two meter (six foot) treadway. Today's two-and-a-half meter wide (eight foot) trail is aligned primarily on the river side of the highway, and along with four expanded rest areas, provides visitors a higher quality of recreational access to the river and side canyon trails than before construction of the Interstate.



by Hugh Morris, Rails-to-Trails Conservancy

# cowboy trail

## MASTER PLAN OF THE COWBOY RECREATION AND NATURE TRAIL

**The 550 km (321 mile) Cowboy Trail** spans eight counties between Chadron and Norfolk, Nebraska. Twenty-two kilometers (14 miles) are open and the rest is under development. The trail will be primarily crushed stone with concrete in the more built-up urban areas.

On September 7th, 1997, the Nebraska Game and Parks Commission opened three short segments of what will be the longest rails to trails conversion in the United States when it is complete. Rails-to-Trails Conservancy (RTC) purchased the rail corridor in 1994 from Chicago and Northwestern Transportation Company for \$6 million, railbanked the corridor, and donated it to the Nebraska State Game and Parks Commission. The value of the material salvaged from the corridor (tracks, ties, and ballast) more than offset the purchase price of the corridor. With the help of \$2 million in ISTEA funds, state support, a \$400,000 grant from RTC, and other private donations and community support, the trail is becoming a reality.

The corridor is primarily rural in nature, passing through small towns about every 16 km (10 miles). The corridor traverses diverse terrain, from the western hemisphere's largest stabilized sand dune formation to hay country to the Elkhorn River Valley. The length of the trail, diversity of the terrain, historical significance of the corridor, and the need to address the concerns of farmers whose property the trail passes through, required a comprehensive trail development and management plan.

The Master Plan was developed over two years and started with a member of the team walking the entire corridor. During the three-week trek he photographed and inventoried soil types, hydrology, climate, vegetation, wildlife, landmarks, buildings, bridges, land use, population and cultural characteristics, and connecting attractions such as other trails, points of historic significance, and recreational opportunities.

The resulting inventory provides trail users with both educational and practical information about the corridor and had the additional benefit of enabling him to contact members of the communities through which the trail passes.

### The plan highlights four notable dimensions of the trail.

**1)** A consistent and long-term vision is established for the trail to ensure an efficient and coordinated plan of development. The plan provides specifications for trail design which allows flexibility for each community to develop their portion of the trail in a way that reflects their individuality.



Cowboy Trail, NE

- 2)** There is an assurance of the rail corridor's preservation, including all 221 bridges, for possible future rail reactivation (as specified under railbanking legislation).
- 3)** A safe recreational resource is created for local families and residents of all ages and physical abilities.
- 4)** Opportunities are identified to stimulate local economies by encouraging local, State, regional, and national tourism. The plan includes elements of design, liability issues, and an overall design concept that will ensure continuity. Lastly, the operational costs were developed, including proposed management and maintenance policies, development priorities, possible partnerships, and estimated costs.

The cost of the plan was \$100,000 which was met by a Transportation Enhancements award from the Federal transportation legislation, ISTEA. The Nebraska Game and Parks Commission used part of the value of the donated corridor as their match required in the Transportation Enhancements program.

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By Karen Stewart, Rails-to-Trails Conservancy

# katy trail

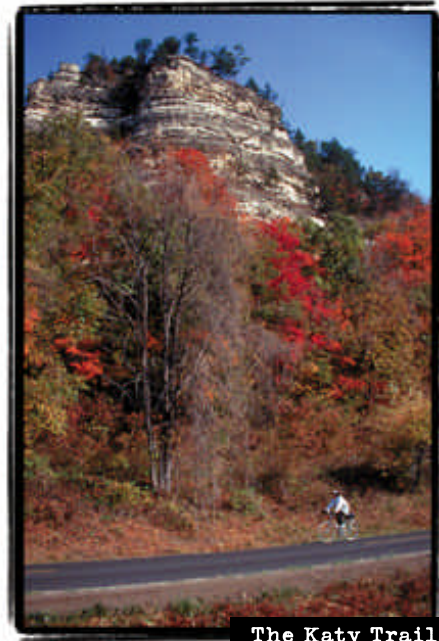
## THE KATY TRAIL

**When the Missouri-Kansas-Texas Railroad** (known as the Katy) decided to cease operation on its 320 km (200 mile) route from Sedalia to Machens, MO in 1986, State parks planners and local citizens recognized the 100-year old corridor's potential as a long distance recreation and transportation facility.

One decade later, the Katy Trail State Park grand opening celebration took place in Jefferson City, Missouri. The Missouri Department of Natural Resources (MDNR) was able to acquire the right-of-way with a \$2.2 million contribution by the late Edward D. "Ted" Jones, a St. Louis businessman who had never before owned a bicycle but recognized the value of preserving the corridor. Once purchased from the railroad, the MDNR immediately began developing the swatch of rich, rural farm land along the northern bank of the Missouri River as a public-access linear park.

With smaller segments opening since 1990, the Katy Trail is currently 300 km (185 miles), the longest rails to trails conversion in the United States. It is operated by the State Department of Natural Resources as part of the Missouri park system. The total right-of-way spans nine counties, 27 levee districts, and unites 35 (primarily rural) towns ranging in population from under 100 to 75,000. The corridor parallels the original route of Lewis and Clark and features the nation's longest center-lift railroad bridge, listed on the National Register of Historic Bridges. The entire route is part of the American Discovery Trail and will eventually connect Kansas City to St. Louis by trail. The Katy Trail also is recognized as the first 'rail-banked' corridor in the United States. (Railbanking is a program under the National Trails System Act that allows for the preservation of rail corridors with their interim use as public trails.)

It is estimated that the trail, with its scenic landscape, packed limestone surface and easy grade (the trail rarely exceeds a 5% grade), attracts 200,000-300,000 users and yields well over \$3 million to local revenue annually. Though the development of the corridor was initially met with several adjacent landowner challenges, the trail has been credited with the



The Katy Trail, MO

resurrection of the economies of multiple towns suffering the ill-effects of the railroad industry's departure. Even some of the most vehement opponents of the trail project began to realize its potential benefits when, in 1990, the first pilot sections of the trail brought streams of visitors to the area. Within weeks of the first portions opening, an abundance of new and old ventures appeared on the local landscape, vying for the new tourism dollars. Restaurants, bed and breakfasts, bicycle sales and service, bicycle rentals, craft and antique shops, and even wineries now dot the trail. Numerous landowners also operate private campgrounds and refreshment areas on their property.

In 1992, the department accepted an additional 54 km (33 miles) between Sedalia and Clinton from the Union Pacific Railroad Company. The MDNR is working on the remaining sections, with hopes of one day having a 380 km (233-mile) rail-trail among its park operations.

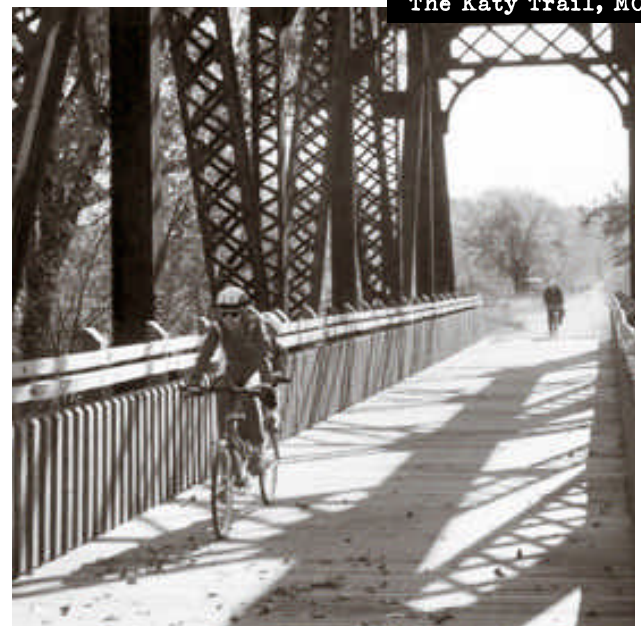
As its name recognition grows, the Katy Trail State Park has received a steady increase in visitors. All 22 department-maintained trail heads provide parking and most provide a range of other amenities, including restrooms, water, bicycle rental, maps, and telephones. The trail is easily

## The Katy Trail

accessed and used with babyrollers and wheelchairs and every mile is marked with a sign post that corresponds to the traditional railroad mileage system. While equestrian use will be permitted on the section between Sedalia and Windsor, equestrian and motorized equipment (outside of official vehicles and motorized wheelchairs) is prohibited. Its popularity has given rise to numerous newspaper and magazine travel accounts, the Katy Trail Guidebook series, and even a frequently visited web site.

The MDNR is capitalizing on this popularity by implementing fundraising and support programs throughout the towns along the trail. The Adopt-a-Section program supports MDNR operations by allowing trail enthusiasts to 'adopt' a trailhead or a two-mile (3.2 km) section of trail in exchange for a \$100 contribution. Sign posts recognizing the donors are placed along the corridor. Trail enthusiasts can also purchase inscribed park benches for \$285, with proceeds going toward trail maintenance. A MDNR volunteer coordinator is currently formulating volunteer task forces within adjacent towns to handle patrols, natural and historic interpretation, and maintenance in their areas. Program participants will receive a newly developed trail-wide newsletter.

In addition to the \$2.2 million donation from Ted Jones that went to the acquisition and preliminary development of the corridor, the MDNR has also received \$1,921,734 in ISTEAF funds over a period from 1992 to 1996 trail construction and the restoration of several historic railroad depots. The Katy Trail operates on an annual budget of \$100,000, with the bulk of the funds devoted to trail maintenance.



The Katy Trail, MO

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ED PATTERSON (412) 463-8636

**NEW YORK SEAWAY CANAL  
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By Patrick Kraich, Rails-to-Trails Conservancy

# rail with trail

## SCHUYLKILL RIVER TRAIL, PHILADELPHIA, PA

**A number of communities have capitalized** on the opportunity to combine trails and greenways within or alongside active rail corridors. Currently there are 54 open rails-with-trails and over 70 projects in the works. Not every rail corridor is a candidate for shared use. Out of the 921 open rail-trails only a handful are rails-with-trails. However, as the following example illustrates, rails-with-trails can be accomplished with proper design and a good working relationship with the adjacent railroad.

The Schuylkill River Trail is a 39 km (24-mile), multi-use path which connects downtown Philadelphia and Valley Forge National Historic Park. Portions of the trail corridor are shared with Conrail, South East Pennsylvania Transit Authority (SEPTA), and PECO Energy. The 3 meter (10 foot) wide paved trail is open to a multitude of user groups, including people with disabilities. About three kilometers (two miles) of the trail is rail-with-trail.

The trail was built in four phases using Federal Highway funds combined with local taxes. Transportation Enhancement funds will be used for a western extension, which also will be a rail-with-trail. The total Federal and local funding will be \$1.3 million.

Land for the trail was secured through fee-simple acquisition and easements. The Montgomery County Commissioners had a contact with a Conrail executive. This was helpful in beginning negotiations with Conrail for an easement for trail purposes within their right-of-way. The easement within Conrail right-of-way was paid for at fair market value.

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### other examples

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WESTMORELAND COUNTY BUREAU OF  
PARKS, (412) 830-3962.

**TRAVERSE AREA RECREATION  
TRAIL (TART), MI:** MIKE DILLENBECK,  
GRAND TRAVERSE COUNTY ROAD  
COMMISSION, (616) 922-4848.

### publication

**RAILS WITH TRAILS: SHARING  
TRANSPORTATION CORRIDORS**  
RAILS-TO-TRAILS CONSERVANCY  
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WASHINGTON, DC 20036  
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Schuylkill River Trail, PA

Design for the trail within Conrail right-of-way was negotiated by Montgomery County Planning Designers and Conrail engineers. Conrail was given final say on trail design within their corridor. The easement was non-specific in terms of design providing a “blank slate” for both parties. This allowed maximum flexibility during the design process. Conrail would not allow at-grade crossings of their mainline but approved two crossings of spur lines used for switching and storing railroad cars. Within the grant of easement there is a clause that prevents Conrail, except in an emergency, from parking or stopping its rolling stock or other equipment in any manner on the easement area that will impede the use or safety of the bikeway. The distance between tracks and trail varies from 4 meters to 1.5 meters (measured from the outer edge of the trail to the center line of the adjacent tracks) with a wood rail fence or grade separation.

Sections of the trail run adjacent to a SEPTA commuter train line. The trail is not within the SEPTA right-of-way. The rails and track are about 6 meters (20 feet) apart, measured from the outer edge of the trail to the center line of the adjacent tracks, with some sections separated by a wood rail fence and others by a culvert. The trail provides nonmotorized access to several SEPTA stations including the Norristown Transportation Center where connections to other forms of transportation can be made.

Liability insurance for the trail is provided in the Montgomery County Parks umbrella policy. Conrail is indemnified from liability where the trail is on their right-of-way.

By Kathleen Wong, Patti Longmuir, Peter Axelson, Beneficial Designs, Santa Cruz, CA

# trail assessment

THE UNIVERSAL TRAIL ASSESSMENT PROCESS: ENHANCING TRAIL ACCESS FOR ALL USERS

**All trail users have different interests,** abilities, skills, and expertise. The Universal Trail Assessment Process accurately and objectively documents trail conditions to increase user safety, identify maintenance needs, and enable users to make informed choices about appropriate trails.

At the 1990 National Council on Disability hearing (Jackson Hole, WY), concern was expressed that most trail information was not sufficient to allow people with disabilities to determine whether the trail was suited to their interests and abilities (i.e. accessible). Peter Axelson, a wheelchair user, outdoor enthusiast, and founder of Beneficial Designs, decided to develop a standardized assessment process which would provide accurate and reliable information about trail conditions. A pilot project with the National Park Service and USDA Forest Service identified five key features which affect trail access: grade, trail width, cross slope, surface type, and obstacles.

Converting the raw information into classifications such as moderate would not give trail users much more information than the existing “length, elevation” trail signs used on most trails. Instead, a universal approach was used to provide information about trail conditions to all trail users, regardless of their abilities. Beneficial Designs

received funding through the Small Business Innovation Research Program of the National Center for Medical Rehabilitation Research (part of the National Institute of Child Health and Human Development at the National Institutes of Health) to develop the Universal Trail Assessment Process, a standardized, objective method for documenting trail conditions. The Universal Trail Assessment Process requires a team of two to four people, one of whom has been trained in the process. Simple tools (compass, tape measure, Smart level, clinometer, etc.) are used to quantify the trail conditions. Data are processed by computer to generate Trail Access Information (TAI) and a grade profile of the trail. TAI provides trail data in a form that is useful to trail visitors, and includes trail length, elevation change, maximum and average cross slopes, and grades, sites where there are obstacles or the surface type changes, and the minimum and average width of the trail.

A system of trail access information symbols and trail signage layouts were developed to visually convey TAI in attractive, easy to read formats. The maps contain text, grade profiles with surface information, and a top view map with symbols showing the sites of major obstacles. Audio descriptions of trail access information were developed for people with visual impairments.



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By Peter Lagerwey, City of Seattle Bicycle and Pedestrian Program

# spot improvement

## SEATTLE'S BIKE SPOT SAFETY PROGRAM

**The goals of the City of Seattle's Bicycle Program** are to get more people bicycling more often and to reduce the number of crashes involving bicyclists. The intent of the Bike Spot program is to make low cost improvements (such as maintenance work, signs, and small construction projects) that improve bicycle safety and access on Seattle's streets. The program relies on citizens to identify problems that need attention because the bicycling public has the best information as to where problems exist and City staff does not have the resources to identify all the problems that need fixing.

**Program Mechanics:** The Citizen Bicycling Improvement Request form is distributed to bike shops, community centers, and published in a local bicycle club newsletter (see graphic). Individuals provide the location and nature of the problem; and their name, address, and phone number. The form has the address of the bicycle program and a place for a stamp. When the form is received, staff assess the request and call the person who filled out the form to let them know that: a) the problem will be fixed; b) the problem needs further investigation; or c) the problem is something that the bike spot program cannot address. In all cases, the citizen knows about how long it will take to respond to their request. A pothole, for example, may be filled in 24 hours while a bike rack request might take six weeks to install. The next step is to determine whether a field check is



needed. Typically, a field check is not needed on routine maintenance items such as a request to sweep a bike lane but is required for improvements such as the installation of signs and bike racks. If an improvement is approved, a work instruction is sent electronically sent to the appropriate City crew who then do the work and notify the bicycle program that the improvement has been completed. Bicycle program staff then call the citizen who originally made the request to complete the loop.

**Funding:** The program works with existing maintenance programs that pay for many of the bike spot projects. For example, the City's "Pothole Ranger" crew does nothing but respond to pothole requests and the bike spot program simply adds a few requests to this existing program. However, new facilities such as bike racks, new signs, and new bike lanes, are directly paid for by the bike spot program. For the past several years, local funds matched with Federal transportation funds have resulted in a program ranging from \$500,000 to \$700,000 per year.

**Comments Regarding Program:** This is the single most important program we administer. Citizens appreciate the quick turn-around on the initial phone call. The program is popular with elected officials and other decision makers since it generates thank you letters and phone calls. Finally, it helps the City defend itself against liability claims since we can demonstrate that we have a safety program that quickly responds to maintenance concerns.

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By Craig Williams, Illinois Department of Transportation

# paved shoulders

## ILLINOIS ACCOMMODATES AMISH BUGGIES AND BICYCLES

**With the assistance of Transportation Enhancement funds,** the Illinois Department of Transportation constructed two noteworthy projects to improve travel conditions for buggies and bicycles in the Amish region of the State. These projects provided a positive solution to ongoing operational complications caused by slow moving horse-drawn buggies operating on State highways.

The large Amish population that resides in East Central Illinois typically shuns motorized transportation in favor of buggies and bicycles. Because many of the shoulders on State roadways lacked sufficient paved width, buggy operators usually were forced to travel in the vehicle lane. Since their operating speeds are slow and much of the area attracts tourists who are unfamiliar with the concept of buggies operating on the roadway, collisions with motorists overtaking the buggies were not uncommon.

These two projects created a network of accommodating roadways in the area surrounding the communities of Arthur and Sullivan. In total, they provided 40 km (24 miles) of roadways with 2.5 meter (eight foot) shoulders. While improving the safety of buggy operations was the primary impetus for the project, the project also made it safer and more efficient for bicyclists — bicycle use is very common among the Amish as well. Since the area has numerous tourist attractions, the provision of paved shoulders also offers more opportunities for bicycle-tourism. In addition, the area is primarily farmland and the paved shoulders allow safer operation of slow-moving farm equipment. The total cost of the work was \$2.3 million, with the first project of 29 km (18 miles) completed in 1993 and the remainder in 1996.

Various States have policies that encourage or require the provision of paved shoulders for improving the conditions for nonmotorized travel. For example, Oregon and Wisconsin both have policies that require paved shoulders on roadways where average daily traffic exceeds 1,000 to 1,200 cars. The paved shoulders provide a safer area for bicyclists and other users to operate away from the traffic lanes and provide numerous other benefits to the traveling public regardless of their choice of vehicle.



Paved Shoulders



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By Jeff Olson, R.A., NYSDOT Pedestrian and Bicycle Program Manager

# pedestrian safety

## PEDESTRIAN SAFETY DEVICES

**Pedestrian safety is a national problem**, and creating better street crossings is part of the solution. A number of new best practices have emerged recently which will make crossing the street safer, including improved new pavement markings, new “Yield to Pedestrians” devices, and new applications of lighting and signage. What makes the following examples “best practices” is the combination of their innovative approach to safety along with a cost-effective means of providing real solutions.

**New Yield to Pedestrians Devices:** Throughout New England, communities have posted a variety of signs in the middle of the road that say “Yield to Pedestrians,” “Stop for Pedestrians,” “Give Pedestrians a Brake,” and other safety messages at crosswalks. For many years, traffic engineers have actively tried to remove these signs because they are not included in the Manual of Uniform Traffic Control Devices (MUTCD). Communities have resisted removing the signs because they are effective, yet at the same time some of their existing signs are either inconsistent with the vehicle and traffic law, or are made out of metal which could be a safety hazard if struck by a motor vehicle. The New York State Department of Transportation (NYSDOT) has come up with an innovative solution to this problem by creating a new specification for “Yield to Pedestrians” devices which can be placed in the middle of the road at a crosswalk.

The new devices are called SPCCDs, or Supplemental Pedestrian Crossing Channelizing Devices. They are made out of traffic safety cone materials and retro reflective fabric — there are no metallic parts. The sign panel is a direct depiction of the New York State Vehicle and Traffic Law, which states that motorists shall yield to pedestrians when the pedestrian is in the same half of the roadway as the motorist. This graphic is now included in the New York State MUTCD and can be used both in the roadway on the SPCCD, or as a separate roadside sign. The devices were crash

tested by the New Jersey State police, and are being evaluated by the University of North Carolina Highway Research Center. The standard specification is available from NYSDOT and the devices are now commercially available.

The development of this innovative “Yield to Pedestrians” device\* represents a cost effective, tangible change in the way New York does business. This effort involved teamwork among government agencies, leadership within NYSDOT, and a public-private partnership to bring the idea to market. With the development of this device, NYSDOT hopes to facilitate the national effort to improve safety for pedestrians, who account for 14% of traffic fatalities in the United States. New Jersey, Washington State, and others are developing similar applications. A version of the SPCCD called the “soft sandwich” is included in the new Washington State Pedestrian Facilities Guidebook. As one of the first states to formally include a “Yield to Pedestrians” device in its State MUTCD, New York believes it has taken a major step towards improved customer service and making transportation more user friendly.

**New Crosswalk Markings:** Two innovative solutions for better crosswalks come from Cambridge, Massachusetts and Salt Lake City, Utah. In Cambridge, a textured thermoplastic crosswalk is being placed in the pavement while the hot asphalt is being rolled. This provides a much longer lifespan for the pavement marking material, which heightens long-term visibility and retroreflectivity. The Cambridge crosswalks are being installed with ladder style markings, which are both more visible and longer-lasting than the basic two stripe crosswalk. Salt Lake City has gone one step further in this direction, installing two sections of ladder-style markings on either side of a section of unmarked asphalt. This provides nearly identical visibility to the approaching motorist, but leaves the center of the crosswalk free of pavement marking materials which can be slippery when wet. Both of these solutions are cost-effective and applicable in all-weather conditions, making crosswalk markings more effective for pedestrians and easier to maintain for public works departments.



Pedestrian Safety Devices



The new devices

are called SPCCDs, or Supplemental Pedestrian Crossing Channelizing Devices.

**“Paint by Numbers” Pedestrian Improvements:** Many innovative pedestrian improvements are low cost to begin with, but several innovators have really advanced the state-of-the-art. For example, Seattle, WA; Las Vegas, NV; and other communities have installed roundabouts made out of barrels or sandbags to test their effectiveness before making permanent installations. In New York City, Mulrey Square was traffic calmed with new curb extensions, sidewalk widenings, and refuge islands all done in paint. After six months of successful use by pedestrians and vehicles, the project was ready to be made permanent. These are excellent examples of low-cost ways of making improvements.



Portland, ME

**High Visibility Crossings:** Washington State has made a “best practice” out of simply using existing features in innovative ways to improve pedestrian safety. One of Kirkland’s new crosswalk prototypes includes mounting pedestrian crosswalk signs overhead, so that they are clearly visible to approaching motorists. In addition, other mid-block crosswalks are being enhanced at locations with medians by angling the pedestrian refuge space in the median at 45 degrees towards the oncoming traffic. This design, originated in Europe, ensures that the pedestrian and oncoming vehicles are visible to one another before the pedestrian leaves the median. Details for lighting the actual crosswalk (instead of just lighting the roadway) have been included in the Oregon Bicycle and Pedestrian Plan. In Toronto, a large, lighted, yellow “X”\* is hung over the crosswalk to make it more visible at night, and Ann Arbor, MI is now using this device.

\* Inclusion in this report does not constitute FHWA endorsement. This device currently is not included in the Federal Manual on Uniform Traffic Control Devices (MUTCD). Before using any traffic control device that is not included in the MUTCD, the interested State or locality should submit a request for permission to experiment to FHWA’s Office of Highway Safety (HHS-10), 400 Seventh Street SW., Washington, DC 20590. Guidelines for conducting an experiment can be found in Part 1A-6 of the MUTCD.

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By Andy Clarke, Rails-to-Trails Conservancy

# bike lanes

## BIKE LANES

**“Cities with higher levels of bicycle commuting** have on average 70 percent more bikeways per roadway mile and six times more bike lanes per roadway mile”, according to a 1993 report commissioned by the Federal Highway Administration. Communities across the country are confirming this and discovering that something as simple as a 1.2 meter (four feet) or 1.5 meter (five feet) wide lane dedicated for bicycle travel is enough to transform potential cyclists into actual riders.

In Corvallis, OR, for example, over 90 percent of the collector and arterial streets have striped bike lanes and eight percent of work trips are made by bike — the highest in the State. The Oregon bicycle program manager says the lanes “lead to an unparalleled feeling of ease: whether riding a bike or driving a car, the behavior of the other is predictable.”

Indeed, bicycle lanes—defined by the American Association of Highway and Transportation Officials as “a portion of the roadway which has been designated by striping, signing, and pavement markings for the preferential or exclusive use of bicyclists”—have been found by numerous researchers over the past 20 years to make both bicyclists and drivers more predictable and more comfortable with each other’s presence.

A 1996 study on the impact of bicycle lanes in Santa Barbara, CA found that streets where bike lanes were added saw the number of bicyclists increase by 47 percent compared to just one percent on streets without bike lanes. The 48 percent overall increase in cycle use represents a real rise of 19 percent when adjusted for population increases in the city.

Many other communities report similar experiences. Larger cities such as San Diego, CA and Tucson, AZ have hundreds of kilometers of bike lanes on major streets and higher levels of bike use than cities the same size without these facilities. Eugene, OR, and Madison, WI both enjoy bicycle travel levels of close to 10 percent of all trips and they have extensive on-street bicycle lane networks that have been developed over many years.

Bike lanes are no longer the preserve of newer, Western cities and college towns. The city of Chicago (40 km (25 miles) in the last year) is narrowly ahead of Philadelphia, New York City, and Houston, in striping and restriping roads to include bicycle lanes. The city of Seattle, long-considered



a bicycle friendly community, recently embarked on a bike lane striping program in the downtown area to extend the reach of the regional trail network into the heart of the city.

The basic design of a bike lane is relatively simple and universally followed in the communities described above. A minimum of 1.2 meters (4 feet) wide, bike lanes are one-way, on-street lanes for bicycle use that are marked with a bicycle symbol and the words “bike lane”. They usually go in the direction of travel and are on the right side of the street. Where parking is allowed, the parking lane may be extended to at least 4 meters (12 feet) to accommodate both parked cars and the bicycle lane — some communities stripe both sides of the lane, others just the outer stripe. Design manuals, such as the AASHTO Guide for the Development of Bicycle Facilities, offer numerous options for integrating bike lanes into intersection design to minimize potential conflicts.

### **As experience with bike lanes develops, different applications are being tried.**

**Counter-flow bike lanes:** Both Eugene, OR and Madison, WI have experimented by striping bike lanes on both sides of a one-way street, making the street two-way for bicyclists but one-way for motorists. In Eugene, the counter-flow lane is on a residential road whereas Madison’s is a wide bike lane on the major street running through the city and University of Wisconsin campus. After initial concerns (and some design modifications), the lanes in both communities have been a great success.

Bike Lanes

**Left-side bike lanes:** Madison, WI also has pioneered the use of bike lanes striped on the left-side of a one-way street. An important pair of one-way streets in the heart of the city had predominantly left-turning movements by bicyclists and thus the bike lane was striped on the left side of the road. Once again, after a six-month period of adaptation, motorists and bicyclists in the city have become accustomed to its operation and it works.

**Advanced Stop Lines\*:** The city of Cambridge, MA has recently restriped a complex signalized intersection with a design that allows bicyclists using bicycle lanes to wait at a red light several meters ahead of other travel lanes. When the light changes, bicyclists can get away quicker and make a left turn without conflicting with other traffic.

**Blue bicycle lanes:** The city of Portland, OR is testing the impact of painting bike lanes blue as they pass through intersections. Cities in

Denmark, the Netherlands, and other European countries have done this for many years (although some choose red or green paint) — this will be the first known application in the United States.



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\*Inclusion in this report does not constitute FHWA endorsement. This device currently is not included in the Federal Manual on Uniform Traffic Control Devices (MUTCD). Before using any traffic control device that is not included in the MUTCD, the interested State or locality should submit a request for permission to experiment to FHWA's Office of Highway Safety (HHS-10), 400 Seventh Street SW., Washington, DC 20590. Guidelines for conducting an experiment can be found in Part 1A-6 of the MUTCD.



by Anita Jenkins, AICP; Wilson, Miller, Barton & Peek

# streetscape

## STREETSCAPE: A COMPREHENSIVE APPROACH

**The idea of streetscape is now commonplace** in the context of urban design, redevelopment, and community planning. In Collier County, FL, the urban design phase of all planned developments includes extensive landscape architecture. Entry features, landscaped medians, and edge treatments are all part of the development identity. In addition, the streetscape—landscaping, streetlights, benches, bike racks, and trash receptacles—becomes a major component of the redevelopment of streets. Collier County has also included streetscape in its overall community planning with the development and adoption of a Streetscape Master Plan.

Landscaping makes a tremendous impact on street appearance. Appropriate median and edge plantings are vital to creating attractive roadways. Street planting can create or reinforce the identity of a street: trees, shrubs, and ground cover and their related spacing along the street establish a pattern which can make the street memorable.

Medians also benefit pedestrians by simplifying the crossing procedure, especially on multi-lane roads. A median refuge allows pedestrians to cross one direction of traffic and wait safely before crossing the next lanes of traffic. Landscaping the edges of roadways also benefits pedestrians by providing shade, interest, and an additional perceived barrier between the roadway and sidewalk.

Collier County has taken a comprehensive approach to implement the streetscape of all the major arterial roadways within the urban area. Collier County, the City of Naples, and private enterprise have combined resources to create and maintain an outstanding streetscape program. This public/private partnership has developed a “signature” for Naples and Collier County over the past decade.

The Development of the Streetscape Master Plan (SSMP) has been a 3-step process over the past three years. **The first step involved data gathering.** State, County, and City design standards were assembled along with major roadway development schedules. Using the Metropolitan Planning Organization’s 15-Year Plan as a guide, a network of divided highways was established as the boundary for the SSMP in urbanized Collier



Naples, FL

County. A shorter action plan relating to Collier County’s 5-Year Highway Improvement Plan was also identified as the near term landscape implementation schedule. A major product from the data gathering phase was the establishment of the urban area streetscape network.

**The second step involved a character analysis.** Various streetscape zones were determined by identifying the character of the street. Proposed landscaping should be inspired by existing, positive site characteristics. The character of a street is defined by the existing and proposed land uses, existing vegetation, natural and unique features, views, and topography.

Character zones were assigned to each street, as appropriate, to guide landscape design. Character zones that were established include the Activity Center Zone, Residential Zone, Utility Zone, Gateway Zone, Urban/Residential Zone, Agricultural Zone, and Conservation Zone.

**The third and final step was implementation.** The Streetscape Master Plan recognized both policies and design in order to be site specific, memorable, and implementable. The Streetscape Master Plan was adopted by the Collier County Board of County Commissioners on May 30, 1997. It is incorporated by reference into the Collier County Land Development Code as a public road rights-of-way, median, and required adjacent landscape buffer development and maintenance guideline.

The landscaping of streets in both planned developments and along the major arterials has created a memorable signature for Naples and Collier County, FL.



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by Ryan Snyder

# bicycle boulevard

## BICYCLE BOULEVARD IN PALO ALTO

**Palo Alto, CA has pioneered a potential solution** to planners attempting to retrofit older cities with bikeways: bicycle boulevards. Opportunities to create space for bike lanes on city streets are often limited by physical and political constraints. Restriping streets with narrower travel lanes is the easiest, cheapest, and most politically acceptable means, but many streets do not have room for bike lanes, even if the travel lanes are restriped. Widening can be expensive; removing parking can mean political suicide; narrowing sidewalks worsens the pedestrians' lot; and reducing the number of lanes on a street runs counter to conventional wisdom.

These constraints typically mean bicyclists must forego bike lanes on many streets where they are needed. Palo Alto's bicycle boulevard provides another option. Bryant Street has been converted to a bike boulevard with traffic control devices that prevent motorists from using the street as a thoroughfare, while improving the speed of bicycle travel. The bike boulevard extends about five km (three miles) through residential neighborhoods, as well as downtown. Several barriers and landscaped islands allow bicycles and pedestrians to travel through, but prohibit cars from using Bryant Street as a through street. In one spot, a bridge over a creek is too narrow for cars, but just right for bikes. Traffic signals allow only bicyclists and pedestrians to go through one intersection with an arterial street, while motor vehicles must turn. These devices cause most motorists to opt for streets where they can go faster and further and only local motorists use

Bryant Street. At the same time, the City has removed many stop signs that impeded bicycle travel. Bryant Street has become a quiet, tree-lined residential street that is fast and peaceful for bicyclists and pedestrians. The City has also signed the bike boulevard well with directional and destination information. As a result, over 600 bicyclists ride on Bryant Street on a typical day.

The first three kilometers (two miles) of Bryant Street were converted into a bike boulevard in 1982. In 1992, the City extended the bike boulevard two km (1.25 miles) north to the city limit, but not without controversy. The City tried temporary barriers for six months and later modified the treatment with permanent fixtures. Many people had concerns over the diversion of traffic from Bryant Street to adjacent streets and as part of the permanent solution, the City put a traffic circle in one intersection to slow motor vehicles instead of block them. This compromise won over many locals.

The City has heard few complaints from residents on Bryant Street. The necessity to drive a car a little further to circumvent barriers is traded for the serenity of living on a quiet street. Most seem to like it.

Bike boulevards may work in other communities. The streets must be selected carefully so as to not divert traffic onto neighboring residential streets. Residential streets flanked on both sides by arterial streets may be the best candidates. Wherever cities try bike boulevards, temporary fixtures during trial periods can improve the design, as well as gain public acceptance.



Palo Alto, CA



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by Jim Mundell, P.E., City of Seattle

# traffic calming

## NEIGHBORHOOD TRAFFIC CALMING: SEATTLE'S TRAFFIC CIRCLES

**Of all the traffic calming devices used in Seattle,** traffic circles have proven to be the most effective at solving neighborhood traffic concerns. Since 1973, more than 600 traffic circles have been constructed in Seattle and the Neighborhood Traffic Calming Program (NTCP) staff receive about 600 requests for traffic circles each year. The program is currently funded to construct 30 traffic circles per year.

Potential traffic circle locations are identified through community requests or investigation of high crash locations. A priority point system, based on the number of crashes that have occurred at the intersection and the speed and volume of traffic, is used to rank the locations where traffic circles are requested. Funding is allocated starting with the location with the worst combination of problems. Residents are required to submit a petition with signatures representing 60% of households within one block of the proposed traffic circle. The cost to construct each circle ranges from \$3,000 to \$6,000.

Each traffic circle is designed individually to fit the intersection. Most of Seattle's local streets are 7.6 meters (25 feet) wide or less and traffic circles are usually four to five meters (12 to 16 feet) in diameter. All intersections where circles are to be constructed are reviewed by the Fire Department and field tests are conducted where they may have a specific concern. Designs may be adjusted or parking restricted to ensure that fire trucks can pass by the circle.

All the traffic circles currently under construction are landscaped. The landscaping plays two important roles, making the circle more attractive to the neighborhood residents and changing the character of the street to make it less appealing to drive at high speeds. Local residents are required to maintain the plantings.

### Publications and contact information:

Additional information including program description, design guidelines, reports, and a video (\$15) may be obtained from:

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### Crash reduction is the greatest benefit of traffic circles.

Between 1991 and 1994 a total of 119 traffic circles were constructed through the NTCP. A comparison of the number of crashes which occurred at these intersections in the calendar year before and after construction reveal a 94% reduction in crashes. The number of injuries dropped from 153 in the year before construction to one injury in the year after construction. This crash reduction was found to continue in the subsequent years.

In addition to reducing collisions, traffic circles also reduce vehicle speeds without significantly reduced traffic volumes. The minimal impact on traffic volumes allows circles to be used as a spot safety device without having to address the impacts of diverting traffic being shifted to other residential streets. Traffic circles reduce a street's attractiveness as a cut through route by their reduction of traffic speeds.

After over twenty years of experience installing traffic circles, Seattle has found them to be an effective device for controlling neighborhood traffic and improving the safety of residential streets.



Seattle, WA

By Laurie Actman, Rails-to-Trails Conservancy

# indianapolis

DOWNTOWN CORRIDOR IMPROVEMENT PROJECT, INDIANAPOLIS, IN

## Indianapolis has undertaken a successful large-scale effort

to revitalize its historic downtown based on improving the pedestrian environment. The Downtown Corridor Improvement Project, located in downtown Indianapolis between Washington and Meridian Streets, has been an integral part of the central business district's revitalization. By reducing traffic on this major thoroughfare and changing it to a more pedestrian-friendly environment, the city hoped to ensure the success of an adjacent new major retail, entertainment, and economic development center.

### The project achieved four main goals in its design:

- 1) changing the street from being purely utilitarian to having both function and aesthetic appeal;
- 2) using plantings, street lighting, furnishing, resurfacing, and special paving to create an environment that fosters pedestrians, sidewalk cafes, and new commercial and retail activities;
- 3) enabling the street to change its orientation from auto-only to pedestrian friendly, including compliance with accessibility guidelines for the physically-challenged;
- 4) acknowledging the history of the area.

Due to the close cooperation of several groups involved in development of the project, it was completed less than six months after the design was finalized. Participating groups included the Indiana Department of Capital Asset Management, Indiana Department of Transportation, City of Indianapolis Department of Metropolitan Development, Indianapolis Downtown, Inc., and Indianapolis Historic Preservation Commission. In addition, ongoing discussions with the local merchants' association helped to ensure that the project was fully supported and fully integrated into the surrounding business district.

## The reconstruction

has stimulated new businesses to relocate to the corridor.



Total cost of the project was \$5,163,126, of which \$4 million was provided through the Transportation Enhancements program. The City of Indianapolis contributed the \$1,693,126 match.

The reconstruction has stimulated new businesses to relocate to the corridor, now considered a prestigious retail location near the Circle Center, the new mixed-use development adjacent to Washington Street. Although the project was completed quickly and successfully, it did face an unexpected hurdle because part of the design was considered to have an adverse affect on the National Register Eligible Historic district known as the Circle Center historic district. Consequently, in order to advance the project, it was necessary to request comments from the advisory council on historic preservation. Ensuring that future projects have received all of the appropriate historic preservation reviews in downtown business districts is essential before the design phase of projects such as this are completed.

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By Richard Retting and Ron Van Houten

# crossing time

## PEDESTRIAN PRIORITY MEASURES

**Pedestrian collisions in the United States** account for more than three percent of injury crashes and 14 percent of fatal crashes. Nationwide, about 37 percent of pedestrian injury crashes and 20 percent of fatal crashes occur at intersections (U.S. Department of Transportation, 1996). In urban areas pedestrian crashes are even more concentrated at intersections, rising as high as 51 percent in some communities (Retting, 1993). Public education and enforcement campaigns have tried—but largely failed—to promote lasting pedestrian safety improvements at intersections. Increasingly, however, traffic control measures are being used to improve pedestrian attention and provide greater separation between pedestrians and motor vehicles.

### Leading Pedestrian Interval Signal Phase

Most traffic signals are designed to release pedestrians and turning vehicles concurrently, providing little or no time separation. One technique that can be used to separate pedestrians and turning vehicles in time is to provide a leading pedestrian interval (LPI) which permits pedestrian traffic to begin crossing several seconds before the release of potentially conflicting motor vehicles. Research by Van Houten et al. (1997) has examined the influence of a three-second LPI on pedestrian behavior and conflicts with turning vehicles.

Subjects of this research were pedestrians crossing at three signalized intersections in St. Petersburg, FL. Prior to the experiment, signal phasing at these intersections were configured to provide onset of the pedestrian walk signal and the green signal for turning vehicles concurrently. During the experiment, a three-second LPI was installed to release pedestrians three seconds before turning vehicles.

During the baseline condition, the number of conflicts per 100 pedestrians who started crossing during a defined five-second begin walk period, averaged 3.0, 2.1, and 3.3 for the intersections of 3rd, 4th, and 5th with Central. After the introduction of the LPI, conflicts were almost non-existent,

averaging 0.1, 0.1, and 0.2. For both seniors and non-seniors there were fewer conflicts during the LPI condition than during the baseline period, for both left- and right-turning vehicles.

The experiment also monitored the impact of the LPI on the number of pedestrians who yielded to turning vehicles. During the baseline condition the number of pedestrians yielding (per 100 pedestrians crossing) averaged 5.5, 5.2, and 4.4 for the three intersections respectively. After the introduction of the LPI the number of pedestrians yielding averaged 2.5, 2.8, and 4.0.

### Summary

The introduction of a three second LPI reduced conflicts between pedestrians and turning vehicles, reduced the incidence of pedestrians yielding the right of way to turning vehicles, and made it somewhat easier to cross the street by allowing pedestrians to occupy the crosswalk before turning vehicles were permitted to enter the intersection. Once pedestrians were in the crosswalk, drivers acknowledged their presence and were more likely to yield the right-of-way.

LPIs, in this study, provided a potentially safer and more comfortable walking environment and should be considered at busy signalized intersections where it is desirable to reduce conflicts between pedestrians and turning motor vehicles.



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By Bob Patten, Rails-to-Trails Conservancy

# lewiston-auburn bridge

## LEWISTON-AUBURN RAILROAD BRIDGE

**By connecting their two downtowns**, the twin cities of Lewiston and Auburn, Maine have learned how to make the connection — the connection between Federal transportation funds and local transportation improvements, between reclaiming your past and charting your future, and between creating a pedestrian- and bicycle-friendly environment and building an economically vital and livable community.

In 1992, these two working class mill towns were emerging from decades of unhealthy competition and a new vision of partnership, cooperation, and community began to emerge. One initiative started in the midst of this was the CABPAC, Cities of the Androscoggin Bicycle and Pedestrian Advisory Committee. This group of pedestrians, bicyclists, and staff from the two communities was charged to develop a regional non-motorized transportation plan for the Lewiston Auburn Comprehensive Transportation Study (LACTS), the local MPO. It quickly became apparent that rehabilitating the aging and abandoned L&A railroad bridge that connected the two downtowns should be the first project. As a new bicycle and pedestrian river crossing, and direct link between the two downtown areas and aging industrial waterfronts, the bridge would form a hub from which all the other needed bicycle and pedestrian trails and pathways would radiate.

The timing of the Intermodal Surface Transportation Efficiency Act (ISTEA) on the national scene added to the synergy. These working class communities could never have afforded the \$418,000, provided by Federal Transportation Enhancement funds and the Maine Department of Transportation (20% match), that was needed to complete the basic design, engineering, and construction activities. This included redecking the bridge with Trex material (made from recycled plastic products), lead paint removal and repainting, and preparation of the approaches on each end of the bridge.

A local TV channel (WCSH-6) raised \$60,000 for the trestle rehab project from a portion of the proceeds of a special advertising campaign promoting local products and companies.

The bridge was opened in the fall of 1995, and efforts have turned to shepherding three additional projects through the implementation process. In Auburn a 2.4 km (1.5 mile) extension of a path on the L&A abandon-



Lewiston-Auburn, ME

ment will connect the bridge with Washington Street using \$190,000 in TE funding; and sidewalks and pedestrian crossings in the neighborhood surrounding the Auburn Mall will be improved with a \$179,000 CMAQ award. In Lewiston, a \$345,000 project will connect the trestle with Main Street, as part of building a railroad waterfront park.

Partly as a coincidence in timing, but mostly through strong public and private partnerships, a recycled railroad trestle, redecked with recycled grocery bags and wood pallets, has become the symbol for recycling two industrial cities. Today, more than 350 people a day use the bridge, and that's not including the early birds — the 20 percent of downtown residents who regularly walk to their 7:00 am time-clock punch-in from the inner-city residential areas.

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By Eric Dibner, City of Berkeley

# silver city sidewalks

## SILVER CITY MAIN STREET

**Silver City, NM** overcame numerous obstacles to reconstruct historic downtown sidewalks to be completely accessible for people with disabilities. Key factors were an affirmative public spirit, methodical planning that included participation of accessibility specialists, and careful monitoring of construction to meet tolerances.

The sidewalks of downtown Silver City have curbs as high as 800 mm (32 inches)! The high curbs help check floodwaters funneled into the narrow downtown from the slopes of the Mogollon Mountains. A number of intersections also have pedestrian bridges that swing into place across the street during flooding. One flood long ago washed away Main Street, leaving a fifty-foot deep canyon, now called the Big Ditch, that has been recreated into a central park.

Mining and outlaws, such as Billy the Kid, helped create the area's history. Today, Silver City's historic character and year-round pleasant climate make the community an attractive tourist destination.

The Main Street Project began planning downtown improvements in 1986. Three public meetings targeted a sixteen-block area for sidewalk reconstruction. Some of the sidewalks date from 1905-1915, and others from WPA projects in the 1930s. Many street corners had steps instead of standard curbs. Previously-installed ramps were unsafe and deteriorated. Merchants had steps at their doorways, blocking patrons with mobility impairments. The major goal was to make the downtown accessible for pedestrians and keep the old-time flavor.

To address these challenges, the Main Street Project helped the City apply for ISTEA Enhancement funds. Additional funds came from local taxes and legislative grants. The City paid for design services from a local firm, Engineers, Inc; and Main Street's volunteer staff visited each of 120 residential and business buildings, identifying concerns and solving problems. With the help of the local Daily News, these efforts garnered wide community support.

Early in the design process, the staff consulted with New Mexico Governor's Committee on Concerns of the Handicapped. This collaboration resolved the location for accessible parking, developed ramp configura-

tions to take creative advantage of the terrain, and agreed on handrail and crosswalk details. Achieving accessibility at each intersection and storefront sometimes called for in-the-field redesign and careful grade control. Instead of following a standard detail, the designers found unique solutions responsive to site characteristics.

Success depended on the close monitoring of construction, carrying through with the contractor, the State Highway and Transportation inspector, and the accessibility experts to get the details right. The staff commitment to the community's daily needs kept traffic flowing during construction by building two-block sections on one side of the street at a time. Finally, the respect for the community's historic character is reflected in sidewalks tinted in sandstone tones so they do not look glaringly new.

For a cost of \$1.1 million, including engineering and design, Silver City constructed more than sidewalks. Landscaping with street trees and border plantings helped restore the historically-correct look. Completing the project on budget allowed the City to use its contingency for benches and trash containers.

The Silver City Main Street Project received the Quality Award from the New Mexico Highway and Transportation Department for a project with a local municipal lead. Project leaders have been recognized by the Federal Access Board and have presented at conferences on the Americans with Disabilities Act. The future goal for this mountain community include extending accessibility through the Big Ditch Park.

Silver City, NM



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Karen Stewart, Rails-to-Trails Conservancy

## safe moves

### SAFE MOVES

**Safe Moves is a nonprofit organization** involved in educating children, parents and the community on pedestrian, bicycle, motor vehicle, train, bus and recreational safety in a fun, non-traditional and interactive manner.

Thousands of school children throughout California are reaping the benefits of traffic safety training courses provided by Safe Moves, a nonprofit organization based in Van Nuys, CA. Students are taught what to do — and what not to do — on city streets. They learn about the potential hazards of alleyways and unknown dogs, how to properly secure a bicycle helmet, and how a green traffic light doesn't always mean that it is safe to cross the street.



When conducting interactive school workshops, Safe Moves educators address bicycle, pedestrian, auto safety, and transit education safety with children. The workshops, geared specifically to different age groups, come equipped with the 'Safe Moves City,' a training course that provides hands-on exposure to sidewalks, streets, driveways, buses, crosswalk signals, railroad tracks, cars, trucks, and even dogs. The simulated city allows children to work one-on-one with skilled safety trainers who evaluate the child's level of understanding of traffic laws and potential hazards and work with them to learn safe bicycle and pedestrian behavior.

In addition to the elementary, middle, and high school recipients, Safe Moves targets programs to parents and other members of the community, conducting programs for law-enforcement agencies, hospitals, transportation agencies, community groups, and physically disabled individuals. Available workshops run the gamut from on-the-road training, traffic violators workshops, and senior citizen programs to community outreach campaigns, bike and pedestrian master plan consulting, and data collection and

evaluation. On-the-road training comes in the form of 'street rides' for qualified children and their families who have completed the workshops and the traffic simulation courses.

Safe Moves conducts evaluations on all of the programs it implements, and the National Highway Traffic Safety Administration and the California Office of Traffic Safety have published reports on the program. Regional analyses indicate that bicycle and pedestrian related crashes have significantly dropped in recent years. Statistics released by the Los Angeles County of Public Works, for example, show that bicycle-related deaths dropped 25% and pedestrian-related deaths dropped 30% between 1993 and 1997.

Safe Moves was established in 1983 by former bicycle racer Pat Hines, in response to the death of a friend in a bicycle accident. Since its founding, the program has received numerous awards, including the 1996 United States Secretary of Transportation Child Transportation Safety Award. Safe Moves' extensive client list includes partnerships with the City of Los Angeles Police Department and Department of Transportation, the Los Angeles County Department of Health Services and Department of Public Works, the San Francisco EMS Agency, the San Diego Unified School District, and some twenty other California cities. Funding for Safe Moves is derived from grants, corporate sponsorships, and a club membership program.

#### contact

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#### other examples

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By Brian Lacy and Andy Clarke

# cycling for kids

## COMMUNITY CYCLING PROGRAMS FOR KIDS

**The Portland, OR Community Cycling Center** runs a series of cycling-related activities to build life and job skills for children of low income families, including a Summer Rides Program for kids between the ages of 8 and 12. Similar programs in other communities are building self-esteem and team responsibility; teaching mechanical, problem-solving and job skills; engaging kids in positive and creative recreational activities; improving bike safety and handling skills; introducing children to their community and surroundings; and distributing affordable bikes and helmets to low income families.

The Community Cycling Center's Summer Rides Program, funded by the Bureau of Housing and Community Development and Metro (a regional government agency), guided 142 children from low income households through a two-week bicycling program in the summer of 1997. During the two week course, a child learns how to wear and adjust a bike helmet, signal, ride safely on city streets (both alone and in a group), inspect a bicycle and perform basic maintenance tasks, fix a flat tire, and find their way around the neighborhood.

Three hour bike rides — developed and managed by Community Center staff and 12 volunteers — enable the kids to explore Portland on their bikes and get to destinations such as a community blood bank, a fire station, the central library and a food shelter. Participants are given pre- and post-program tests to rate their acquisition of knowledge during the course. On a scale of 0-10, skills master rose for the 8 to 10 year-olds from 3.9 to 8.5 and for the older kids from 6.6 to 9.5.



Portland, OR

In the Winter and Spring of 1996, the Bicycle Coalition of the Delaware Valley (BCDV) started a Youth Cycle and Recycle program along similar lines to the Portland program. Working with the Philadelphia Housing Authority and local businesses, the BCDV arranged monthly rides to destinations within the city that the children rarely knew even existed. After riding the 11 km (7 miles) from his housing project home to a wildlife refuge near Philadelphia's airport, one rider said "I never knew that Philadelphia looked like this."

BCDV Executive Director Sue MacNamara says, "Seeing a bunch of grade school kids take a corner on their bikes in straight formation, using hand signals, is almost as exciting as watching a pack of professional cyclists gracefully take a downhill turn."

In Atlanta, GA, James Chapman of the Georgia Transportation Alliance taught a six-week Citizen School for 11-14 year-olds in the summer of 1995. The apprenticeship made students more aware of the transportation needs of the community and taught them how to read maps, survey public opinion and inventory streets for pedestrian and bicycle conditions.

The course concluded with the students presenting their findings and making recommendations on how to make the community around their school more bicycle-friendly. Representatives of the city staff and city council attended the briefing, which included call for repairing broken sidewalks, smoothing out rough roads and installing bike racks at schools.

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**other examples**

**TRIPS FOR KIDS:**  
SAN FRANCISCO, MARILYN PRICE,  
(415) 381-2941

**BICYCLEWORKS:**  
ST. LOUIS, ROY BOHN, (314) 772-6115

by Carolyn Helmke, Bicycle Coordinator for RIDES for Bay Area Commuters

# bike commute day

## THE CALIFORNIA BIKE COMMUTE DAY

### **Coordinated by the California Bike Coalition since 1995,**

the California Bike Commute is an annual statewide event which promotes bike commuting on a designated day or week in the month of May.

In 1994, the fledgling California Bicycle Coalition began organizing for a 1995 “Bike-to-Work Day” event that would unite California bicycle groups, municipalities, and large employers in the promotion of bicycle commuting throughout the state. “California Bike Commute” was based on studies from San Diego County Bike-to-Work Days, which proved that these promotions were successful in convincing first-time bike commuters to become regular commute cyclists.

The first California Bike Commute Day was held on May 4, 1995. Despite bad weather in northern California, over 11,000 cyclists “registered” for this event, and according to registration information, 263,000 km (163,450 miles) were traveled by bicycle commuters that day.

This event found instant popularity with the public and the media. Over 100 cities, counties, and Ride Share agencies participated throughout the state. Hundreds of employers promoted the event at company worksites. In addition, hundreds of media outlets covered the event, including radio, newspaper and television coverage.

The amazing element of the California Bike Commute was its success on a shoe-string budget. Caltrans and a handful of Rideshare or transit agencies donated posters and registration cards, while T-shirt sales paid for administrative costs and limited advertising. The bulk of this event was developed on volunteer time and energy, with small donations from a variety of bike clubs and retailers.

The California Bicycle Coalition continues to promote the ever-expanding California Bike Commute, and the number of participants and parties involved has continued to grow. Coordinating days, or weeks, which specifically promote bicycle commuting are a proven method of increasing numbers of commute cyclists. The California Bicycle Coalition has also found the California Bike Commute to be an effective means of increasing membership.

San Francisco, CA



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### **other examples**

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By Gary Sjoquist, Minnesota Coalition of Bicyclists

# twin cities map

## TWIN CITIES BICYCLE MAP AND COMMUTER GUIDE

**The Twin Cities Bicycle Map and Commuter Guide** is a highly detailed street map of Minneapolis and St. Paul, covering a 630 square km (243 square mile) area, with insets of both downtown as well as the University of Minnesota. It features on-street bicycle lanes, paved trails, and uses three colors to rank streets good, fair, and poor for bicycle use. The reverse side features a complete resource guide to commuting and crash avoidance tips, a listing of bicycle dealers and annual events, and information about State, county, and city advisory boards and committees.

### The Original Map (1991)

In 1990, a survey of University of Minnesota (U of MN) commuters found that twenty percent of students and ten percent of faculty and staff bicycled to campus three seasons of the year. Based on this information, a grant was awarded to the Minnesota Community Bicycle Safety Project in the U of MN Extension Service to develop a map to promote bicycle commuting at the University. The University of Minnesota Bicycle Guide and Commuter Map was published in 1991. Using the U of MN as a core and extending approximately 13 km (8 miles) in each direction, this map clearly showed commuters the safest routes into the University and surrounding

areas. Nine thousand copies of the map were produced and sold at area bookstores and bicycle shops.

### The New Revised Twin Cities Bicycle Map and Commuter Guide (1997)

In the summer of 1996, the decision was made to revise the map. The revision process began with the realization that less than 20% of the map's gross income was available to fund production of the next version, which was estimated to cost \$15,000.

A plan was developed to solicit support from interested agencies and organizations and a project coordinator, Gary Sjoquist of the Minnesota Coalition of Bicyclists, was hired. Working with the bicycle advisory committees of Minneapolis and St. Paul, the Parking and Transportation Services division of the University of Minnesota, Mn/DOT, and the Metropolitan Council (the area MPO), the funds were raised to revise, print, and distribute the new map, now called the Twin Cities Map and Commuter Guide.



Twin Cities Bicycle Map and Commuter Guide

maps and guides

Armed with the promise of funding, the map's DXF and Arc Info coverage files were transferred from the Minnesota Department of Transportation to the University of Minnesota's Cartographic Laboratory. The U of MN Cartography Lab blended the Mn/DOT data with U.S.G.S. rectified digital ortho photo quad coverage of downtown Minneapolis, St. Paul, and the University campuses to provide the map's highly detailed base. Over a four month period, revisions to the map were made by soliciting input from bicycle commuters, cycling clubs, city and county maintenance officials, and by riding many of the streets and trails. Three colors were used to rate streets good, fair, or poor based on roadway width, average daily motorized traffic volumes, traffic control signal locations, and information about bicycle commuter roadway use. The new map was completed and put into distribution in May 1997, and within five months sold nearly 4,000 copies without the benefit of the peak sales months of March and April. The map has been hailed as a legible and accurate map and a useful resource for both commuting and recreational cyclists.

**Key Changes to the New Map**

Now renamed as the Twin Cities Bicycle Map and Commuter Guide, the map was further revised to include the nearly 32 km (20 miles) of on-street bicycle lanes in Minneapolis, St. Paul, and the University campuses. By bringing the map on to a digital platform, the area of the map was extended nearly 3.2 km (two miles) without changing the map's physical size. From a marketing standpoint, this allowed the map to now feature the complete St. Paul Bikeways Plan as well as show safe access to the Mall of America (recently hailed as the most visited site in America) and still remain a convenient size when folded.

Another significant change was to replace the nomenclature "off-road" with "off-street" to acknowledge off-road (dirt) mountain bike trails in the area. Another key change refocused the map's insets to include one combination inset for both University campuses, and insets for Minneapolis and St. Paul downtown areas. The resource guide information was updated and a list of bicycle dealers within the map's area added, as well as a list of larger annual bicycle events.

**summary**

**TWIN CITIES**

The Twin Cities Bicycle Map and Commuter Guide is an excellent example of cities, State agencies, and a major university working together to produce a lucid and extremely useful map of a major urban area for pedestrians, in-line skaters, and bicyclists.

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**other examples**

**CITY OF NEW YORK**

Two of a series five bike maps (one for each Borough) covering New York City were published in the Spring of 1997. Each map, produced on recycled paper, features a city-wide map on one side and a borough-specific map on the other. Intended for cyclists of all ability levels, the maps show recommended on-street routes and facilities, parks, trails, bike shops, and other destinations.

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**CITY OF SAN FRANCISCO**

An innovative and exciting public-private partnership between the San Francisco Department of Parking and Traffic (DPT) and Pacific Bell resulted in publication of a detailed city-wide bicycle route map — in the 1997 Yellow Pages for the city. Pacific Bell Yellow Pages volunteered to be responsible for the entire map production.

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**THE ILLINOIS DEPARTMENT OF TRANSPORTATION**

has created a series of bicycle maps covering different regions of the State — the maps provide information on the traffic and roadway conditions bicyclists can expect to encounter. The maps were created in partnership with a local University.

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By Ben Gomberg and Randy Neufeld

# safe bicycling

## “SAFE BICYCLING IN CHICAGO” RIDES ON

### What's a good way for a city agency to promote safe cycling?

In Chicago it's by partnering with the local bicycle advocacy group to produce an award-winning booklet.

In 1994, the Chicago Department of Transportation received a \$30,000 Highway Traffic Safety (Section 402) grant to produce a booklet on safe bicycling skills. The city contracted with the Chicagoland Bicycle Federation, Chicago's bicycle advocacy group, to write the booklet. The Chicagoland Bicycle Federation had previously produced a one-page flyer for the Chicago Department of Transportation.

The result of the new collaboration is a 36-page booklet that provides basic skills for urban cycling, including how to negotiate traffic, safely cross intersections, dress for bad weather, and prevent bike theft. More than 100 illustrations and photographs complement the non-technical, concise text. Polish and Spanish language versions also were produced to make the information accessible to Chicago's major non-English speaking groups. The booklets were free of charge to the public.

The booklet has been so popular that it has been reprinted and reprinted. More than 100,000 copies have been circulated to date with the best distribution points being bike shops, bike clubs, bike messenger services, and fitness clubs.

In 1996, because of the tremendous demand from outside Chicago, the Illinois Department of Transportation contracted with the Chicagoland Bicycle Federation to produce a statewide version. "Safe Bicycling in Illinois" has become one of the Illinois Department of Transportation's most popular publications, with 100,000 copies printed. The Chicago Area Bicycle Dealers Association (CABDA) published a special version in 1996 to provide the booklet to a national audience and emphasize the value of specialty bicycle retailers.

In 1996, the Chicago Department of Transportation secured another Highway Traffic Safety grant to produce three new versions of the booklet for Chicago residents:



**An abridged 12-page version** featuring its main points. The considerably lower cost, 10¢/copy versus 30¢/copy for the 36-page version, enabled 100,000 copies to be printed, permitting widespread distribution (e.g. sporting goods stores, universities, public libraries).

**A children's version** to teach safe bicycling skills to 10 to 12-year old children, the ages considered most effective for training. Over 175,000 copies will be printed for distribution at elementary schools, bike stores, and police stations.

**On-line versions.** The abridged and children's versions will be posted on the City of Chicago's home page ([www.ci.chi.il.us/WM/CDOT/Bikes](http://www.ci.chi.il.us/WM/CDOT/Bikes)) in early 1998, to make this information more accessible.

### What's next?

Funding is being sought for a teacher's guide with classroom and on-bike exercises to accompany the children's booklet. Booklet chapters may also be spun off into flyers. For example, the chapter on preventing bike theft could be reprinted by the police department.

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By Donald W. Tighe for the International Police Mountain Bike Association

# police on bikes

## COPS ON BIKES: REDUCING CRIME, CUTTING COSTS, AND IMPROVING COMMUNITIES

**From the smallest towns to the biggest cities**, from university campuses to National, State, and local parks, from the snow-swept streets of Alaska to the manicured White House lawn, law enforcement officials are leading a riding revolution. The Police on Bikes movement is changing police departments at the close of the 20th Century more than anything has since automobiles were introduced in the early 1900s.

The recent resurgence of bike patrols began in the late 1980s in Seattle, WA, where the police department began using bicycles because of congested downtown streets. The patrols were an immediate success. Because of the benefits that police departments could gain by sharing ideas, training tips, patrol tactics, uniform advancements, and safety concerns, a Police on Bikes Conference was initiated by the League of American Bicyclists in 1991. Later, the International Police Mountain Bike Association was formed. Today, over 10,000 officers from 45 States have received IPMBA's *Police Cyclist™* training.

### How Do Cops on Bikes Help Communities?

Police administrators usually are convinced to support the introduction or growth of bicycle patrols once they are made aware of the benefits to their departments:

**Bike patrols are cost effective**—10 to 15 bike officers can be fully outfitted for the cost of one patrol car.

**Bike officers can travel faster** and farther than foot officers—and they are able to patrol and pursue in areas that are unreachable by car.

**Bicycles give officers the “stealth” advantage**—because they are silent, cops on bikes can ride right up to the scene of a crime before they are noticed. This has uniformly increased arrest rates and is a newfound success in fighting street crime.

**Bicycles are great public relations tools**—an officer on a bike is much more approachable than one in a patrol car.

**Officer morale is improved.**

**Departments have cited lower health care costs** due to a more fit officer corps.

Once bike patrols are up and rolling, such benefits tend to make them self-sufficient. Communities as a whole benefit from introducing bike patrols, which is why local bike clubs, bike shops, and other community groups often help to raise start-up funds (about \$1,000 to fully equip one bike, with an annual maintenance fee of about \$100—versus an average of \$23,000 to purchase one patrol car plus an annual maintenance fee of over \$3,000).

Cyclists also point out that in communities with a visible bike patrol:

- 1) Bicyclists are more easily recognized as legitimate users of the roadway system.
- 2) The benefits of bicycling are more visible.
- 3) Other personnel within the police department are exposed to the special needs of bicyclists. Enforcement of traffic laws for all road users becomes more uniform.
- 4) Bike officers can initiate road improvement requests where necessary for safe bicycle use.
- 5) From schools to parks, and from downtown business districts to quiet neighborhoods, bicycles are helping bridge the gap between law enforcement agencies and the communities they are sworn to protect.

### Keeping “the Finest” Safe and Effective

IPMBA is a non-profit education organization that provides the best, most complete training for bicycle officers. While IPMBA training has literally spanned the globe since its inception in 1991—with courses having been taught in English, French, Spanish, and Russian, in ten countries on four continents—the United States leads the way.



San Antonio, TX

### publications

**A CONTACT GUIDE TO IPMBA MEMBERS' DEPARTMENTS** (600 ACROSS THE COUNTRY) IS AVAILABLE TO INQUIRE ABOUT LOCAL BENEFITS, CHALLENGES, AND FUNDING OPPORTUNITIES (IPMBA; \$20).

**“THE COMPLETE GUIDE TO POLICE CYCLING”** IS A 250-PAGE, DETAILED MANUAL OF THE SKILLS, BACKGROUND, AND RESOURCES NECESSARY FOR OFFICERS AND COMMUNITIES NEW TO BIKE PATROLS (IPMBA; \$20).

### contact

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by Ryan Snyder

# bike to work

## BICYCLE COMMUTER PROGRAM AT FLEETWOOD ENTERPRISES

**Fleetwood Enterprises provides a model** in attracting people to commute by bicycle and disproves the myth that Californians can't be pried out of their cars. While many companies in the United States ensure their employees have free car parking and other incentives to drive to work, Fleetwood Enterprises has shown what happens when equivalent financial incentives are offered to those who bicycle to work.

In 1988, the South Coast Air Quality Management District (SCAQMD — the Los Angeles region's air quality agency) started mandating that large employers encourage their employees to commute to work by means other than driving alone. Companies have been free to design their own incentive programs, as long as they increased the ratio of commuters to vehicles to 1.5. Many companies offered preferential parking to carpoolers, subsidized vanpools, provided bus passes, or allowed employees to work from home. Some offered bicycle commuter incentives.

Fleetwood Enterprises, located in suburban Riverside, California, 100 km (62 miles) east of downtown Los Angeles, employs about 650 people to make recreational vehicles and manufactured homes. When Fleetwood Enterprises embarked upon their bicycle commuter program, about one percent of their employees rode to work on a bicycle, consistent with the regional average. The company enacted one of the most ambitious set of bicycle incentives in the region. They built bicycle lockers for safe parking and provided showers and clothing lockers so people could clean up and change before work. Fleetwood made the tools in a shop available for bicycle repair and provided financial incentives in the form of a point system. Each day someone bicycled to work, they received two points worth \$1

**Each day** someone bicycled to work, they received two points worth \$1 each that could be accumulated and exchanged for gifts from a catalog.

each that could be accumulated and exchanged for gifts from a catalog. Every month the company held a bicycle promotional event. Fun rides, prize drawings, lunches, casual dress, or other bike-to-work day incentives enticed employees to join. The Employee Transportation Coordinator, a specially trained employee with the responsibility of carrying out the ridesharing program, organized the incentives and promotional events, and placed notices on bulletin boards. When the bicycle program was in full swing, approximately 10 percent of the employees commuted to work by bicycle, a ten-fold increase. This magnitude of change in travel behavior far exceeds what many experts believe possible, especially in a suburban community like Riverside, CA.

Political winds have changed and policy makers have charted a more "business-friendly" approach to clean air. About two years ago, Fleetwood Enterprises opted for an alternative to ridesharing and dismantled their bicycle commuter program. They still have bike lockers, showers, and clothing lockers but no longer give financial incentives or promote bicycle commuting. They stopped tracking the number of bicycle commuters. What remains is the knowledge that bicycle commuter programs can work and that Southern California's ridesharing mandate was quite effective in encouraging changed behavior.

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By Ritch Viola and Andy Clarke



# walkable arlington

## TRANSIT AND PEDESTRIAN ORIENTED DEVELOPMENT IN ARLINGTON, VA

**Twenty-five years ago, Arlington County, VA was a languid suburban community** just across the Potomac River from Washington, DC. Today, the county has been transformed into a thriving, diverse urban community with a balance of residences, offices, and retail. The catalyst has been the opening of eleven stations on two lines of the regional subway system (Metro).

County leaders and planners in the 1970s agreed to concentrate intensive development around the planned transit stations and to create a mix of office, retail, residential, and public uses. Stable residential neighborhoods more than one kilometer away from the stations would be connected to the new development with pedestrian walkways.

Since the opening of the Metro stations (six stations in 1976 and five in 1979), more than 2,175,000 square meters (23,400,000 square feet) of commercial development and 20,000 new residential units have been built along the two corridors — more than double the rate in the 20 years prior to 1977. The population has grown to an historic high of 186,000 and more than 218,000 people work in the County.

More than 95 percent of office space and 67 percent of retail in the County is now within walking distance of transit. Residents of the two Metro corridors use transit for 41 percent of work trips compared to the regional average of only 15 percent. Only one third of the residents drive to work compared to 72 percent for the region. Three-quarters (76%) of transit trips are initiated by walking compared to 25 percent at other Northern Virginia stations.

This transformation to a walking and transit based community has been achieved by keeping walking distances short, making walking safer and more secure and ensuring walking is comfortable and attractive.

### Keeping walking distance short

- Mix land uses within neighborhoods and blocks
- Place highest density closest to transit stops
- Place parking underground or away from activities
- Create diagonal and mid-block walkways through developments
- Bridge barriers to pedestrian travel

### Making walking safer and more secure

- Provide adequate time at pedestrian traffic signals
- Enhance mid-block crossings
- Reduce pedestrian crossing distances
- Calm vehicular traffic
- Provide adequate lighting along walkways

### Making walking comfortable and attractive

- Widen sidewalks
- Make ground floors interesting
- Plant trees and display public art
- Install benches, shelters, and awnings
- Remove utilities and obstructions from walkways

The County has also avoided (or is correcting) common mistakes such as surrounding the transit stations with parking, making roads too wide and difficult to cross, neglecting pedestrian walkways, and relying on private redevelopment for all improvements. Arlington County has worked cooperatively with developers and Metro to complete facility improvements in a systematic manner over many years.



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By John Ciccarelli

# bikes on board

## CALTRAIN "BIKES ON BOARD" PROGRAM

**Caltrain is a 110-km (70-mile) passenger rail line** connecting San Francisco with Silicon Valley. Caltrain accommodates a total of 24 bicycles on all trains and 48 on some — the highest capacity in North America — offering the door-to-door convenience of a car throughout a 900 square km (350 square mile) area. Trains operate from 6am to midnight, with several per hour at commute times and hourly service at most other times.

### Cost, Funding, and Revenue Impact

San Francisco County contributed \$30,000 in State Transportation Development Act funds for the design, fabrication, and installation of the first onboard racks, which created a capacity of 12 bicycles per train. Caltrain's operating budget increased capacity to current levels. By attracting customers who would otherwise drive, the program repaid its startup costs within six months and is now a revenue source. Ridership increased over 7% recently and some attribute 4% to cyclists. There are now over 1,500 cyclist boardings each weekday, and advocates expect demand to continue rising.

Carrying bicycles also saves transit operators hundreds of thousands of dollars annually because cyclists bring their own "shuttle". (By contrast, about 20 "free" shuttle bus lines log about 2,500 daily boardings, requiring subsidies on the order of \$50,000 per line (\$1 or more per ride)).

### Parties involved / Public involvement

The Counties of San Francisco, San Mateo, and Santa Clara have owned the line since 1992 and oversee it through a Joint Powers Board composed of elected officials. Amtrak operates the system. An August 1992 meeting attended by over 200 people led to a pilot program with capacity of 4 bikes per train and the formation of Caltrain's Bicycle Advisory Committee. The BAC meets at least quarterly, includes cyclists from each county plus staff and conductors, and has helped to develop racks, printed materials, and policies. Caltrain's Citizens Advisory Committee (CAC) expressed crucial early support for bicycle accommodations.

The San Francisco Bicycle Coalition ([www.sfbike.org](http://www.sfbike.org)) and Silicon Valley Bicycle Coalition ([www.svbcbikes.org](http://www.svbcbikes.org)) were instrumental in gathering support from individuals and employers. The recently formed Mid-Peninsula Bicycle Coalition (<http://blue-room.com/MPBC/>) supports bike access in San Mateo County.

The "caltrain-bikes" Internet list is a forum for resolving problems and generating ideas. At least one conductor participates, and staff follows the discussion.

### Critical step

A Bicycle Advisory Committee is essential. Support from large employers helps considerably because each represents hundreds of customers.

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#### other examples

##### THE WWW.BIKEMAP.COM WEBSITE

LISTS OVER 170 NORTH AMERICAN TRANSIT SYSTEMS THAT CARRY BICYCLES. EXAMPLES INCLUDE BART (BAY AREA RAPID TRANSIT, [www.bart.org](http://www.bart.org)), WASHINGTON'S METRO SUBWAY ([www.wmata.com](http://www.wmata.com)), AND BOSTON'S MBTA SUBWAY ([www.mbta.com](http://www.mbta.com)). THE CYCLISTS TOURING CLUB SITE (<http://www.ctc.org.uk/trains.html>) LISTS BICYCLE ACCOMMODATIONS ABOARD ENGLISH RAIL SYSTEMS.

#### contact

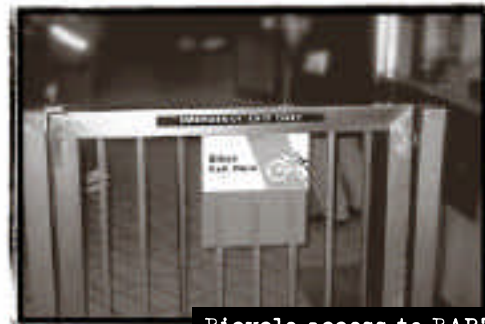
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#### contact

##### THE GLOBAL CYCLING NETWORK

([www.cycling.org](http://www.cycling.org)) HOSTS THE CALTRAIN-BIKES, BART-BIKES, AND BIKES-N-TRANSIT LISTS.



Bicycle access to BART, CA

by Tim Oliver, Maricopa County

# bikes on buses

## PHOENIX BIKES ON BUSES PROGRAM

**In 1991, the Phoenix Transit Department** implemented its Bikes on Buses Program using an alternative rack design, which improved how bikes were transported. This rack and the operational guidance used, has once again made the integration of these two modes a viable option for agencies across the country.

As the 1980s ended, the once common integration of bikes on buses had nearly disappeared. Transit agencies across the country had taken steps to integrate these modes, but for various reasons, only remnants of these programs still existed by 1990. Around this time, a group of citizens representing three area bicycle groups approached the City of Phoenix Transit Department to consider allowing bikes on buses. Phoenix Transit welcomed the idea and invited the groups to help with a study.

A task force was formed comprised of citizens, staff from several governmental agencies, and private industry. This committee reviewed existing data from around the country and identified many shortfalls, such as route and time limitations, equipment drawbacks, and operational constraints caused by loading delays. With these shortfalls identified, the committee outlined a pilot project and funding to carry it out.

In March 1991, the Phoenix Bikes on Buses Pilot Program was implemented with funding from the City of Phoenix and an Air Quality Demonstration Grant from the Arizona Department of Transportation. The unique feature of Phoenix's Bikes on Buses Program was the rack used. This front mounted, locally designed rack made by Mobilis — which is now available commercially — allowed for two bikes to be carried at once.

Either bicycle could be removed without touching the other bike, which reduced loading delay. Of note, this rack has also proved to be durable and does not affect other maintenance routines used by transit agencies.

The six month pilot program installed racks on 40 buses operating on three routes in the Phoenix Area and carried over 5,500 bicycle toting passengers. Upon successful completion of the pilot, the Phoenix City Council approved the system-wide expansion of the Program. Federal and matching state dollars financed the project which now carries more than 1.5 million passengers with bicycles every year.

The success of the program caught the attention of other transit agencies. In only one year after implementation, more than 70 transit agencies from across North America contacted Phoenix for information on its bikes on buses program. Today, many transit agencies - including Tucson, Seattle, Portland, and San Jose - have instituted bikes on buses programs. Quality racks are now widely available through several manufacturers and range in price from \$300 to \$500, excluding installation.



The success of Phoenix's Bikes on Buses Program, and many others like it, depend on people understanding that continuous improvement can be made to any process. In this case, existing programs were enhanced through careful study and evaluation, and the development of an alternative rack design which changed how bikes were transported. These changes turned bikes on buses into a successful venture for transit agencies across the country that continues to draw new riders to transit and bicycling today.

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(204) 783-3348

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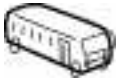
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**rack manufacturer**

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**rack manufacturer**

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WOODINVILLE, WASHINGTON 98072-6476  
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By Susan Doherty, Rails-to-Trails Conservancy

greater austin

## “BUILD GREATER AUSTIN” PROGRAM

**Few transit agencies can match Austin's** Capital Metropolitan Transportation Authority commitment to improving conditions for bicycling and walking.

In 1994, the Build Greater Austin (BGA) Program was initiated as a ten-year capital improvement program by the Capital Metropolitan Transportation Authority (CMTA), the City of Austin and ten surrounding communities within CMTA's service area. The program is funded through the Capital Metro budget which is financed by a one percent sales tax collected throughout the Austin metro area. The \$71 million program includes \$20 million for capital mobility projects and \$11 million for street and mobility projects outside the city.

What makes this program unique is the commitment by a transit authority to alternative modes of transportation through pedestrian and bicycle improvements. Bicycle and pedestrian planning groups, local mobility impairment advisory groups, and individuals provide consistent and ongoing input into potential projects to ensure full public participation.

The City of Austin has dedicated \$3.6 million to sidewalk installation. Prioritization of sidewalk installation along bus routes is accomplished through analysis of ridership demographic data. Additionally, the CMTA works cooperatively with mobility impairment advisory groups to identify and remedy locations needing spot mobility improvements. This includes, but is not limited to, sidewalk spot repair, obstruction removal and installation of bus stop pads and curb ramps.

Other pedestrian improvements funded through the BGA Program include \$280,000 toward the Walnut Creek Trail project—an east/west

## The program is funded

through the Capital Metro budget  
which is financed by a one percent  
sales tax collected throughout the  
Austin metro area.

trail corridor, ongoing funding for two major streetscape renovations along Guadalupe Street in the University district and South Congress in the southern part of the city, shared-cost sidewalk improvement projects sponsored by BGA and TX DOT, as well as several sidewalk, curb ramp, and trail projects in the ten surrounding suburban communities.

In 1996, the BGA Program supported several bicycle facility improvements such as trail connectors, street restriping, spot sweeping for bike lanes, barrier-crossing along a major arterial, and bicycle/transit integration through city-wide promotional activities. CMTA was also the first Texas transportation authority to equip its bus fleet with bicycle racks. The program has been highly successful and new buses are now fitted with racks before delivery. For 1998, the proposed allocation includes improvements to rail crossings, trail signage, and durable bicycle lockers for park and ride locations.

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By Ben Gomberg and Randy Neufeld



# chicago **bike** parking

## ACTION TO MAKE CHICAGO BICYCLE-FRIENDLY: THE BIKE RACK PROGRAM

**One of the best examples of Chicago's successes** is the City's Bike Rack Program. Bike racks were a natural beginning project given the new availability of Congestion Mitigation and Air Quality Improvement program (CMAQ) funding and the Bike 2000 Plan's emphasis on short trips. By the end of 1997, 4,250 racks were in place throughout the city. The racks have been installed as a part of three separate CMAQ grants totaling \$1.5 million. Another \$170,000 CMAQ grant has been received for 1998 rack installation.

Early in 1992 the Mayor's Bicycle Advisory Council decided to test new bike rack designs. Thirty-one wave and inverted-U racks were tested at 10 buildings: city hall, libraries, and municipal offices. The racks looked good and attracted use immediately. The test cost less than \$15,000 and was funded through an existing guardrail contract.

The city applied for \$750,000 for bike parking in the first call for CMAQ project proposals which occurred soon after this successful trial. The first 1,100 racks were sited according to suggestions from city staff and volunteer survey teams from the Chicagoland Bicycle Federation. Special attention was given to distribute available racks between government buildings, cultural institutions, parks, neighborhood retail, and the central business district.

At first the Illinois Department of Transportation wanted site plans for all 1,100 racks. Later they accepted a set of standardized installation configurations and a list of installation locations. Because of the initial quantity of rack installations, it was not feasible to contact adjacent

property owners. A letter was sent to each alderman listing installation locations in their ward. The first responses to the racks were mostly negative, but only a handful of racks were actually relocated. However, the positive response came quickly and clearly: the racks attracted use; several of those who asked that racks be removed asked to keep them; and businesses that didn't get racks wanted to know why they were overlooked.

The 1998 project will include a demonstration of higher security, longer term parking.

### **Some of the strategies that have made the projects successful:**

- The "Inverted-U" design functions especially well. These racks do not obstruct the sidewalk, they can accommodate any type of lock, and it is easy to stand bikes against them.
- Cyclists and property owners are invited to suggest locations through postcards, newspaper articles, and the Internet.
- Consent to install a nearby rack is received from nearby property owners.
- The importance of locating racks as close as possible to the building entrance cannot be overemphasized.
- The managers of schools, parks, transit stations, museums, libraries, post offices, and other institutions are systematically asked if racks are needed.

The racks utilize high quality materials, "bombproof" coatings, and secure mountings. These make the racks more expensive initially but they look better and require less maintenance.



Chicago, IL

### **contact and publication**

#### **THE BIKE 2000 PLAN,**

BIKE RACK PROGRAM SPECIFICATIONS, AND OTHER CHICAGO BICYCLE PROGRAM PUBLICATIONS ARE AVAILABLE FROM, BEN GOMBERG, CHICAGO DEPARTMENT OF TRANSPORTATION 30 N. LASALLE, ROOM 400, CHICAGO, IL 60602

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### **other examples**

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by Ryan Snyder

# long beach

## LONG BEACH BIKE STATION

**Urban planners in today's American cities might look** to the Long Beach Bikestation for clues to attracting people out of their cars. American communities have spread out in land use patterns that lack the compactness needed for convenient access to transit. Since passengers typically will walk no more than 1 kilometer to a transit stop, the number of people who live convenient to transit is small. Since cyclists can easily travel three to five kilometers (two to three miles), bike-transit centers can attract people out of their cars by expanding the band of potential riders approximately ten-fold. This is critical to air quality since most air pollution emitted from autos spews out during the first few kilometers of the "cold start."

The Long Beach Bikestation is the first of its kind in the United States. Initiated primarily through ISTEAs Congestion Mitigation and Air Quality program and Los Angeles County Metropolitan Transportation Authority (LACMTA) funds, the Bikestation features:

1. Free valet parking for 150 bicycles
2. Rentals of commuter, folding and electric bicycles
3. Bicycle repairs and tune-ups
4. A bicycle accessories shop
5. A restroom and changing area
6. A coffee bar and patio seating
7. Bike-on-transit info and licenses, bike route maps, and transit service info
8. Bike safety and maintenance classes
9. Bike loaner trial program for commuters
10. Commuter bike club
11. Bike-to-work day promotion as well as a bike maintenance program for at-risk youth

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### other examples

#### BIKE CENTRAL

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The Long Beach Bikestation is open from 6 a.m. to 7 p.m. Monday through Friday, and from 9 a.m. to 6 p.m. on weekends and it is usually staffed by one or two people.

Located on the transit mall in downtown Long Beach, the Bikestation is at the end of the Metro Blue Line light rail, 35 km (22 miles) south of downtown Los Angeles and cyclists can transfer from train to bus or local downtown shuttles. More than 50 km (30 miles) of bike paths serve the Bikestation and patrons can conveniently walk to offices, shops, restaurants, as well as hotels and the Convention Center.

The Bikestation structure cost \$125,000 to build, roughly the same as six stalls for autos in a typical parking structure, on land donated by the Long Beach Redevelopment Agency. The colorful structure is made of lightweight metal and translucent fiberglass and is bolted to a concrete pad. Employees hang the bicycles on overhead hooks. It has become more than a convenience center for bicyclists and a booster to transit ridership: community leaders believe the Bikestation has enlivened the street and attracted tourists.

After only 18 months of operation, the Bikestation parked about 1,500 bicycles per month with an increase of about 10 percent per month. Salaries, marketing, and general overhead are funded equally by the City and the LACMTA. The facility also maintains a volunteer program comprised of senior citizens, at-risk youth, and other civic-minded people.

The Long Beach Bikestation has fostered the start of similar facilities in suburban Santa Clarita and Chatsworth, Union Station in downtown Los Angeles and the City of Palo Alto. The Long Beach Bikestation is encouraging more communities to address transportation policy with this unique way of linking the advantages of bicycling with those of transit.



Long Beach Bikestation, CA





# additional resources

(Not including references included in Best Practices reports themselves)

## General

*National Bicycling and Walking Study Final Report*, FHWA, 1993

*National Bicycling and Walking Study Case Studies (24)*, FHWA, 1993

*Bicycle and Pedestrian Safety and Accommodations*, a three-day training course available through the National Highway Institute, FHWA, 1996

*A Synthesis of Bicycle Safety-related Research*, FHWA, 1994

*Pedestrian Crash Types: A 1990s Informational Guide*, FHWA, 1997

*Bicycle Crash Types: A 1990s Informational Guide*, FHWA, 1997

## Planning

*Bicycle and Pedestrian Planning Under ISTEA: A Synthesis of the State of the Practice*, FHWA, 1997

*Bicycle and Pedestrian Planning Under ISTEA: A Training Manual*, FHWA, 1994

*Selecting Roadway Design Treatments to Accommodate Bicyclists*, FHWA, 1992

*Bicycle Facility Planning: APA Planning Advisory Service Report 459*, APA, 1995

*Making the Connection: Integrating Land-use and Transportation Planning for Livable Communities*, 1000 Friends of Oregon, 1997

*A Bicycle-friendly City* (video), Bicycle Federation of America, 1995. (\$20)

## Off-road Facilities

*Guide to the Development of Bicycle Facilities*, AASHTO, 1991

*Trails for the 21st Century: A Planning, Design and Management Manual for Multi-use Trails*, Rails to Trails Conservancy, 1993

*Greenways*, Flink and Searns, Conservation Foundation, 1993

*Trail Intersection Design Guidelines* (Draft) prepared for Florida DOT by the University of North Carolina Highway Safety Research Center in 1996.

*Rails with Trails: Sharing Corridors for Transportation and Recreation*. Rails to Trails Conservancy, 1998.

## On-road Facilities

*Guide to the Development of Bicycle Facilities*, AASHTO, 1991

*A Policy on Geometric Design of Streets and Highways*, AASHTO, 1995

*Making Streets that Work*, City of Seattle, 1996 (video and workbook)

*Design of Pedestrian Facilities, Report of Recommended Practice*. Institute of Transportation Engineers (ITE).

*Residential Street Design and Traffic Control*, ITE

*Traffic Calming*. APA Planning Advisory Service Report Number 456, 1995.

*The Pedestrian Environment*, 1000 Friends of Oregon, 1993.

## Education, Encouragement and Enforcement

*Mean Streets: Pedestrian Safety and Reform of the Nation's Transportation Law*. Environmental Working Group, 1997

*Share the Road: Let's Make America Bicycle-friendly*. Environmental Working Group, 1997

*The Complete Guide to Police Cycling* (\$20), IPMBA.

## Where to Obtain these Resources

### FHWA PUBLICATIONS

NATIONAL BICYCLE AND PEDESTRIAN CLEARINGHOUSE  
1506 21ST STREET NW, SUITE 210  
WASHINGTON, DC 20036  
(800) 760-6272

### RAILS-TO-TRAILS CONSERVANCY

1100 17TH STREET, NW; 10TH FLOOR  
WASHINGTON, DC 20036  
(202) 331-9696

### BICYCLE FEDERATION OF AMERICA

1506 21ST STREET, NW; SUITE 200  
WASHINGTON, DC 20036  
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### LEAGUE OF AMERICAN BICYCLISTS

1612 K STREET, NW; SUITE 401  
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(202) 822-1333

### ENVIRONMENTAL WORKING GROUP

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SUITE 600  
WASHINGTON, DC 20009  
(202) 667-6982

**INSTITUTE OF TRANSPORTATION ENGINEERS**  
525 SCHOOL STREET, SW; SUITE 410  
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### AMERICAN PLANNING ASSOCIATION

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### AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS

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### 1000 FRIENDS OF OREGON

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(503) 497-1000

### FLORIDA DEPARTMENT OF TRANSPORTATION

BICYCLE AND PEDESTRIAN PROGRAM  
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### CONSERVATION FUND

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### CITY OF SEATTLE

BICYCLE AND PEDESTRIAN PROGRAM  
SEATTLE ENGINEERING DEPARTMENT  
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# acronyms and credits

## Acronyms

<b>AASHTO</b>	.....American Association of State Highway and Transportation Officials
<b>APBP</b>	.....Association of Pedestrian and Bicycle Professionals
<b>CIP</b>	.....Capital Improvement Program
<b>CMAQ</b>	.....Congestion Mitigation and Air Quality Improvement Program
<b>DNR</b>	.....Department of Natural Resources
<b>DOT</b>	.....Department of Transportation
<b>FHWA</b>	.....Federal Highway Administration
<b>FRA</b>	.....Federal Railroad Administration
<b>FTA</b>	.....Federal Transit Administration
<b>ISTEA</b>	.....Intermodal Surface Transportation Efficiency Act of 1991
<b>MUTCD</b>	.....Manual of Uniform Traffic Control Devices
<b>MPO</b>	.....Metropolitan Planning Organization
<b>NHTSA</b>	.....National Highway Traffic Safety Administration
<b>NRTF</b>	.....National Recreational Trail Fund
<b>RTC</b>	.....Rails-to-Trails Conservancy
<b>TE(P)</b>	.....Transportation Enhancement (Program)
<b>TIP</b>	.....Transportation Improvement Program

## Photo Credits

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