Bicycle and Pedestrian Facilities and Programs

In a Nutshell

Bicycle and Pedestrian Facilities and Programs refers to all structures and services that encourage and promote the active lifestyle of walking and bicycling. Benefits to the community include lower carbon emissions and reduced traffic congestion resulting from reduced use of automobilies, increased physical activity, and improved health of the population.

The “How To”

The St. Louis region has developed many bicycle and walking trails in the previous decades. Good weather and a relatively flat terrain make it ideal for expanding public use of bicycles. A limiting factor today is safety and the perception of safety for bicyclists and pedestrians. As the region develops more recreational trails, the need for bicycle access from neighborhoods to the trails will increase. Bikeways that are clearly marked, separated from busy roads, and designed to increase the level of security for the rider are important. Likewise, to encourage walking, streets need to have good sidewalks, safe crosswalks, and responsive pedestrian signals. Schools can provide significant support for students walking and cycling. Businesses can encourage more people to commute by providing showers and changing rooms, as well as bicycle storage facilities. Increased bicycle patrol by local police departments on the trails and sidewalks can greatly change the safety and perception of safety felt by the residents. In addition, bicycling and walking are effective ways to Reduce Vehicle Miles Traveled.

In order to establish a bicycle and pedestrian facility or program, communities should give adequate time and resources to pre-planning, advocacy, and designing and constructing the facilities and programs. They should plan for the safe and efficient operation and maintenance of any facility or program that is created.

Pre-Planning and Advocacy

The two major steps useful in pre-planning a bicycle and pedestrian facility or program are:

1. Perform a Bikeability Audit to understand current biking conditions. The Pedestrian and Bicycle Information Center of the U.S. Department of Transportation has created a Bikeability Checklist to help communities gauge the current bikeability of their area.
2. Identify streets appropriate for bike/pedestrian treatments. For example, consider daily traffic volume, travel speed, proximity to recreational space (parks, waterfronts, architectural features), and connection to institutions (schools, museums, civic centers, etc.).

Trailnet’s Planning page provide a list of projects Trailnet is currently working on and projects from years past. Click here to read Trailnet’s Connecting St. Louis Report, a master plan with a bold vision to transform the City of St. Louis by connecting neighborhoods, cultural centers, and business districts with a seamless on-street network of safe connections of bikeways and sidewalks.

Great Rivers Greenway offers a list of current greenway projects, as well as an interactive map.

The Missouri Bicycle and Pedestrian Federation provides a how-to guide for bicycle and pedestrian trail advocacy.

The Missouri Livable Streets Advocacy Manual is a resource useful in advocating for walkable and bikeable communities. The manual is broken down into the following subject areas:

- Introduction to Livable Streets
- General Strategies for Effective Advocacy
- Steps for Building a Successful Livable Streets Campaign
- Techniques for Engaging Policymakers
- Techniques for Speaking at Public Meetings
- Roadway Planning and Design Process
- Livable Streets Resources

Designing and Constructing Facilities

The growing popularity of bicycling in the St. Louis region prompted the update of the Regional Bicycling and Walking Transportation Plan. The Plan places emphasis on defining the nature of bicycling and walking environments and serves as a "how-to and when-to" resource document for communities developing bicycling and walking facilities. The final Plan was completed in July 2005 and adopted by the East West Gateway Board of Directors. This plan, as well as the 2012 Gateway Bike Plan, is available here.

Roadway design requirements and guidance for bicycle and pedestrian facilities and signage are summarized by the American Association of State Highway and Transportation Officials (AASHTO), the National Association of City Transportation Officials (NACTO), and the Federal Highway Administration’s (FHWA) Manual on Uniform Traffic Control Devices (MUTCD).

For Bicyclists:

- Planning: AASHTO's Guide for the Development of Bicycle Facilities
- Design: NACTO's Urban Bikeway Design Guide
- Engineering: Pedestrian and Bicycle Information Center's Design and Engineering Guidance
- Signage requirements: FHWA's Manual on Uniform Traffic Control Devices

For Pedestrians:

- Planning: Audits of walking facilities, including crosswalks, signal timing, and signal responsiveness, are important. Jaywalking is much more likely to occur where there is no clearly-marked crosswalk. A pedestrian who has to wait too long for a crossing signal light to change is also likely to jaywalk, thereby adding risk to street crossings even when accomodations are provided.
- Design: In new developments, design for pedestrians and bicycles can include direct routes, cut-though paths, sidewalks and bikeways separated from vehicular traffic. In retrofit situations, the relationship of the neighborhood to the surrounding business districts and parks should be considered before determining the best location of new facilities and walkways.
- Engineering: Pedestrian and Bicycle Information Center's Design and Engineering Guidance
- Signage Requirements: FHWA's Manual on Uniform Traffic Control Devices

ADA Compliance: The U.S. Access Board provides comprehensive guidance on complying with the

Americans with Disabilities Act with regard to public rights-of-way.

Operation & Maintenance

Before finalizing the design or locations of bicycle and pedestrian facilities, the cost of maintaining the facility needs to be considered. Bike lanes and parking, walking paths, and street furniture need to be kept clear with visible markings. General principles used in maintaining streets should be applied to sidewalks and trails for safest operation and maintenance including snow removal, debris removal, striping, and signage. Additional modifications might be necessary, and those can be found under the Dollars & Cents tab of this tool.

Planning & Zoning

Local Bicycle & Pedestrian Plans

For a full list of links to local bicycle and pedestrian plans, see the Discover More tab.

State and Federal Bicycling Laws

The Missouri Bicycle and Pedestrian Federation provides a comprehensive list of federal and Missouri state laws that relate to cyclists and pedestrians.

The Missouri Department of Transportation's Bicycle Pedestrian Program offers a full page of resources on topics ranging from local to national trails, safety, and state and federal laws.

Trailnet's website offers an Advocacy page which lists the organization's advocacy projects and the policies they have successfully helped implement.

Bike St. Louis offers a list of St. Louis City and State of Missouri biking laws.

Sample Local Ordinances

In 2012, the City of St. Louis became the fourth city in Missouri to pass a bicyclist/pedestrian anti-harrassment ordinance.

Section 220.340 of the Municipal Code of the City of Chesterfield is an example ordinance outlining the rules of usage by bicyclists on city trails.

Section 255.080 of the Municipal Code of the City of St. Charles is an example ordinance outlining general bicycle regulations within city parks.

Dollars & Cents

Grant Opportunities

The Recreational Trails Program of the Missouri State Parks offers grants for the establishment or enhancement of trails.

Project Costs

Below are some examples of improvement options and modifications appropriate for bicycling and pedestrian programs, a price estimate of the improvement option/modification, some conditions that may affect the cost, and some ideas as to how to minimize the cost. The financial figures have been taken from the Pedestrian and Bicycle Information Center.

Bicycle Lanes

Cost:

- $5,000-$50,000 per mile

Depends on:

- Condition of the pavement
- The need to remove and repaint the lane lines
- The need to adjust signalization

Cost saving ideas:

- Build bicycle lanes during street reconstruction, while streets are being resurfaced, or when roads are being newly constructed
- Instead of resurfacing, reduce the lane width to the FHWA minumum (10-11ft) on roads lower traffic volume and stripe the remaining asphalt with a bicycle lane or widen the curb

Roadway Narrowing

Cost:

- $1,000-$10,000 per mile

Depends on:

- Whether or not the old paint needs to be changed
- Whether or not on-street parking is added
- How many lane lines need to be removed

Cost saving ideas:

- Build bicycle lanes during street reconstruction, while streets are being resurfaced, or when roads are being newly constructed
- Determine the importance and necessity of raised medians and raised sidewalks, as these options increase cost

Lane Reduction

Cost:

- $5,000-$20,000 per mile

Depends on:

- Width of street before lane reduction
- Whether sidewalks exist and if not, if sidewalks will be added with reduction
- Whether or not on-street parking is being added

Cost saving ideas:

- Reduction occurs after paving or an overlay
- Ensure the roadway capacity and overall roadway safety is not jeopardized, which might require additional changes in the future and add additional costs

Raised Medians

Cost:

- $15,000-$30,000 per 100 feet

Depends on:

- Conditions of existing curbs and roadways
- Design of proposed medians

Cost saving ideas:

- Include raised medians in roadway improvement projects
- Include raised medians in utility improvement projects
- Ensure that there is enough room on the proposed street for a raised median before beginning construction

One-Way vs. Two-Way Streets

Cost:

- $20,000-$200,000 per mile

Depends on:

- Length of roadway being treated
- Whether or not signals require modification for the conversion
- The necessity of traffic-calming measures designed to reduce speeding on one-way streets

Cost saving ideas:

- Ensure that the proposed area is capable of handling the conversion, as changing the streets back to how they were before the modification is an additional cost
- Evaluate the need for crossovers, where one-way streets become two-way, as the cost for these modifications can approach millions of dollars

Roundabouts

Cost:

- $45,000-$150,000 for neighborhood intersections
- Up to $250,000 for arterial street intersections

Depends on:

- Acquisition costs for rights-of-way
- Condition of existing streets leading into the proposed roundabout

Cost saving ideas:

- Ensure that the proposed roundabout does not encompass streets with more than one lane of traffic in either direction
- Include roundabout construction in a roadway improvement project
- Roundabouts have typically lower ongoing maintenance costs compared to traffic signals

Sidewalks and Walkways

Cost:

- $15 per linear foot for curbing
- $11 per square foot for walkways

Depends on:

- Slope and other conditions of existing ground
- Availability of a buffer zone between the street and sidewalk
- Desirability of street furniture along the sidewalk

Cost saving ideas:

- Asphalt is less expensive than concrete but requires more maintenance
- Install sidewalks during the initial construction phase of the street or building along the street
- Retrofit areas without sidewalks in phases, in order to spread out the cost over time

Curb Ramps

Cost:

- $800-$1,500 per curb ramp (new or retrofit)

Depends on:

- Conditions of existing ground
- Modifications necessary to follow the Americans with Disabilities Act design guidelines

Cost saving ideas:

- Identify priority areas, including those downtown, near schools, near transit stops, and near residences with people who use wheelchairs. Install curb ramps in these areas first, and curb ramps in other areas at a later time.
- Follow the Americans with Disabilities Act design guidelines during construction to eliminate the need to modify recently-constructed curb ramps in the future

Roadway Lighting Improvements

Cost:

- Varies

Depends on:

- Desired fixture type
- Service agreement with utility company
- Number of fixtures desired

Cost saving ideas:

- Anticipate a proper number of fixtures before construction in order to eliminate the need to add more in the future
- Decide whether it is more important to pay more money for a fixture which requires less maintenance, or a less expensive fixture with increased maintenance costs

Street Furniture/Walking Environment

Cost:

- Varies

Depends on:

- Amount and type of furniture desired
- Material used to create furniture
- Amount and type of planting material
- Condition of existing ground and necessity for improvements regarding drainage, width, and visibility concerns

Cost saving ideas:

- Be selective in planting material, with an emphasis on plants that will last a long time
- Decide whether the longevity of the furniture is more important than the acquisition costs
- Ensure that the ground is sufficiently useful prior to beginning construction, in order to prevent costs during construction

Life-Cycle Costs/Return on Investment

Investments in bicycle and pedestrian facilities have benefits that go beyond measured economic benefits and can be difficult to demonstrate when seeking project funding. The University of Minnesota has developed Guidelines for Analyzing the Benefits and Costs of Bicycle Facilities that helps quantify the social and economic benefits of bicycle facilities.

The goal of a bicycle or pedestrian facility or program should not be aimed at creating a monetary profit, but should instead be aimed at increasing human health, increasing alternative transportation methods, decreasing pollution emission, and decreasing the total usage of vehicles on streets and roadways. A positive return on investment would be seen in the increased usage of facilities, the increased health of the residents, the decreased usage of vehicles, and decreased criminal incidents resulting from the usage of the facilities and programs.

Measuring Success

Essential Elements of a Bicycle-Friendly America

According to the League of American Bicyclists, the "essential elements of a bicycle-friendly America" can be evaluated through the Five E's:

1. Engineering - Creating safe and convenient places to ride and park
2. Education - Giving people of all ages and abilities the skills and confidence to ride
3. Encouragement - Creating a strong bike culture that welcomes and celebrates bicycling
4. Enforcement - Ensuring safe roads for all users
5. Evaluation and Planning - Planning for bicycling as a safe and viable transportation option

Each community that develops bicycling and pedestrian facilities and programs can use this format and these benchmarks to gauge the effectiveness of the plan. For example, Education goals can be established that state 50 percent of all fifth-graders in the community will be aware of and knowledgeable of bicycle and walking paths within two years of program initiation. Another example could state that an established goal of a community is to increase bicycle police patrol units that will spend more time on the pathways and trails than in a squad car.

Quantifiable Measures of Success

The City of Rosemount, Minnesota offers the following qualifiable measures of success for the implementation of a more bicycle and pedestrian-friendly community:

- Annual or biannual pedestrian counts

- Vehicle-bike-pedestrian crash rates
- Number of participants at walk-bike events
- Number of participants in walk-bike classes
- Miles/numbers of bicycle/pedestrian facilities: trails, sidewalks, bikeracks, benches, etc.

The Gateway Bike Plan offers quantifiable measures of success in four different categories: Long-term Performance Measures, High Priority Performance Measures, Medium Priority Performance Measures, and Lower Priority Performance Measures. The best performance measures, according to the Gateway Bicycle Plan, are those that are quantifiable, yet do not require onerous data collection. Both of the long-term measures and several examples from the other categories are listed below. In total, the Plan identifies over 50 actions that need to be taken in order to establish success of the program.

Long-term Performance Measures

- Number of bicyclists observed at counting locations
- Crash rate

High Priority Performance Measures

- Fund a regional Bicycle/Pedestrian Program Coordinator
- Number of identified spot high crash rate locations rectified
- Number of miles of installed bicycle facilities complying with AASHTO guidelines and MUTCD standards
- Create and revise bikeway system map
- Percentage of jurisdictions that have adopted Complete Streets ordinances or similar practices

Medium Priority Performance Measures

- Number of identified and resolved barriers affecting accessibility and safety on roadways
- Number of state, county, and local agencies that have adopted bicycle facility maintenance programs
- Number of miles of on-street bicycle route signs installed
- Number of schools with active Safe Routes to School programs
- Indentify key personnel and contacts at each governmental agency

Lower Priority Performance Measures

- Number of miles of existing on street bicycle facilities and number of intersections safely audited
- Number of new League Cycling Instructors certified and actively involved in providing trainings
- Identify a Training Program Coordinator
- Number of training workshops offered to enforcement officers
- Number of community events that provide bicycle parking

Discover More

Local Bicycle & Pedestrian Plans

Downtown Multi-Modal Access Study: A study was solicited to identify needs and opportunities for improving

access and connectivity for all modes of travel serving Downtown.

Explore Columbia Comprehensive Alternative Transportation Plan: The objective of this plan is to provide a conceptual framework guiding future on- and off-street bicycle and pedestrian facilities, with the overarching goal to transform the City of Columbia into an even more bicycle- and pedestrianfriendly community.

City of Ellisville Bikeable Walkable Community Plan: The Ellisville Bikeable Walkable Community plan exemplifies the City's vision to create a safe and pedestrian friendly infrastructure for community connectivity, improve the well being of residents, generate economic growth, and foster a sense of community in Ellisville.

City of Ferguson Bicycle and Pedestrian Plan: Ferguson's walk-able, historic Downtown business district is one of the City's most unique recognizable features. However, Ferguson's existing infrastructure, geography, and the difficulties typical of aging, inner-ring suburbs result in a number of issues and challenges to increasing bike-ability and walk-ability throughout the City.

Franklin County Bikeable Walkable Plan: The purpose of this study is to examine the potential for bicycling and walking to function as transportation modes useful in the everyday lives of Franklin County re sidents.

Mounds Heritage Trail Master Plan: The Mounds Heritage Trail Master Plan analyzed various routes to connect Cahokia Mounds to the historic Mound Sites in Old North St. Louis and to Sugar Loaf Mound in South St. Louis, MO.

Best Practices Guide - Mounds Heritage Trail: The Mounds Heritage Trail Route is a planned corridor from Cahokia Mounds in Collinsville along a route predominately aligned with US Rt. 40 through Fairmont City, E. St. Louis in Illinois and over Eads Bridge and into Old North St. Louis and south to Sugar Loaf Mound in Missouri. The goal of the trail was to connect the communities and highlight the cultural, historic and natural features along the route.

City of Rock Hill Bicycle and Pedestrian Master Plan

Scott Air Force Base Bicycle & Pedestrian Commuter Plan: This document represents the Shift Your Commute: Scott Air Force Base Bicycle & Pedestrian Commuter Study.

Explore Swansea Comprehensive Alternative Transportation Plan: The objective of this plan is to provide a conceptual framework guiding future on- and off-street bicycle and pedestrian facilities, with the overarching goal being to transform the Village of Swansea into an even more bicycle- and pedestrian-friendly community.

City of Union Bikeable Walkable Community Plan: This document examines existing bicycling and walking conditions in the City of Union, Missouri, and lays out a plan for these modes to function in a dual capacity: as an element in the city's transportation system; and as a substantial enhancement to the city's recreational infrastructure.

University City Bicycle and Pedestrian Plan: University City's location as an inner-ring suburb and its interconnected street grid presents unique opportunities for enhancing walking and biking for transportation, recreation, and fitness.

Explore Waterloo Comprehensive Alternative Transportation Plan: The objective of this plan is to provide a conceptual framework guiding future on- and off-street bicycle and pedestrian facilities, with the overarching goal to transform the City of Waterloo into an even more bicycle- and pedestrian- friendly community.

Regional Resources

The Bicycle and Pedestrian Program of the East-West Gateway Council of Governments offers regional resources, bike and walk tools, and general information for bicycling and walking facilities and programs. The website also provides information about the St. Louis Regional Bicycle and Pedestrian Advisory Committee and the St. Louis Regional Bicycling and Walking Transportation Plan.

In addition to offering a list of performance measures, the Gateway Bike Plan provides a long-term vision of providing a connected system of on-road bicycle routes throughout the St. Louis region.

Trailnet is an advocacy group promoting bicycling throughout the St. Louis region. They offer a Streets for Everyone informational brochure and guide. Their Best Practices Guide offers information related to Safe Routes to School; car-free commuting; planning for nonmotorized transport; and their Health, Active & Vibrant Communities initiative. They also offer a Slow Your Street guide for pop-up traffic calming.

Founded in 1988, St. Louis BWorks offers children the opportunity to earn a free bike while they learn about bicycle safety and maintenance.

National Resources

The Pedestrian and Bicycling Information Center offers a broad range of services to help your community become more livable.

The Walk Score website offers a rating between 0 and 100 that gauges the walkability of any address, neighborhood, or city.

The American Planning Association's National Infrastructure Investment Task Force Report offers information and findings regarding current conditions and challenges affecting the nation's infrastructure. The document mentions bicycling and walking programs specifically on page ten and intermittantly throughout the rest of the report.

Case Studies

Pedestrian and Bicycle Master Plan/ Bikeable Walkable Community Plan

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Description

A Pedestrian and Bicycle Master Plan is a transportation plan for non-motorized travel. The planning process takes 6 to 12 months, depending on the size and scope of the plan. The planning process includes public

outreach, data collection and analysis of existing conditions, establishment of vision, goals, and objectives, and planning the routes and infrastructure types. Close collaboration with community members and municipality staff is essential at every step of the project to create a plan that reflects community desires and possibilities. Key deliverables include:

- Evaluation of existing network, policies, and programs
- Policy and programming recommendations
- Prioritized route and maintenance recommendations with cost analysis

Cost $0

Lessons Learned

- The planning process raises awareness of biking and walking as legitimate forms of transportation and as legitimate areas of public concern in municipalities. In several of the communities we have worked with, biking and walking programming beyond what the plan called for has been implemented. For example, Richmond Heights has painted sharrows on low-traffic residential streets to guide people biking through their town to enhance their existing plan.
- Pedestrian and Bicycle Master Plans provide a strong rationale for cities to include pedestrian and bicycle elements in routine maintenance and upgrading of existing roads. Every year when federal transportation grants are due, cities we have worked with contact us for letters of support for the sidewalks and other amenities they have included in their federal grant applications.
- Implementation requires community champions both in and out of City Hall. Residents and staff must work together to ensure that the plan is made reality. Public outreach at every step of the process, including education on what it takes to make a place inviting for biking and walking, is key.