



EXECUTIVE SUMMARY

Over the last decade, non-motorized transportation has become an increasingly important component of progressive growing communities like Billings and Yellowstone County. Increased levels of bicycling and walking result in significant benefits in terms of health and physical fitness, the environment, and transportation-related effects. Bicycle and pedestrian facilities are also often an expression of community pride and character, and in many cases a means of preserving the natural and historical resources of a region.

It is important for Billings and Yellowstone County to have an adopted plan for non-motorized forms of transportation in order to be eligible for federal funds, as well as to avoid missed opportunities for trail and bikeway development. Since the adoption of the *Intermodal Surface Transportation Efficiency Act* (ISTEA) in 1991, and subsequent transportation bills (TEA-21), the federal government has legitimized walking and bicycling as transportation modes through higher levels of funding than ever before. Federal policy requires that communities develop and adopt a non-motorized element of their overall community transportation plan in order to be eligible for this funding. As the Planning Board, City Council, County Commission, and other bodies consider new land developments or public infrastructure projects, there is often only one opportunity to choose a solution that enhances non-motorized transportation – and that opportunity shouldn't be missed.

BikeNet, the original non-motorized transportation plan for the City of Billings, was adopted in 1994. When this took place, Billings took a decisive first step toward achieving a community vision of a city where quality of life is paramount. This vision included implementing a system of trails and bikeways that would invite Billings' citizens to get off their couches and out of their cars. It also included a set of recommendations that addressed policies, land use, education, enforcement and design. *BikeNet* was truly a pioneering document for the Billings community, educating us on the importance of trails and leaving a lasting legacy of interest groups and trails that have set the stage for future development of the entire network. *Heritage Trail* recognizes the work that was developed through the *BikeNet Plan* and builds on a community-based planning process that had public participation and input as its cornerstone. *Heritage Trail* builds on the foundation provided by *BikeNet*, and enhances it in a number of important ways:

NEW IDENTITY. The planning team explored opportunities for the trail system to be not just a functional and recreational system but also one that offered interpretive opportunities. As trail corridors were identified and evaluated, it became evident that there were numerous cultural and historical places and events that offered a look back to our rich “Heritage” that could be identified, accessed and interpreted. This idea grew into the driving force behind the new identity of the trails system – *Heritage Trail*.

EXPANDED & UPDATED. *Heritage Trail* expands the concept of *BikeNet* to embrace a larger constituency of users. No longer just a bike plan, *Heritage Trail* embraces walkers and runners,



in-line skaters and skateboarders, equestrians and others. As a plan for the “Greater Billings Area,” *Heritage Trail* includes links to outlying areas including Laurel, the South Hills, and Lockwood. In addition, *Heritage Trail* includes specific policy recommendations that will move the community closer to achieving its vision of a cohesive system of linked trails and bikeways. More than just a way to get from A to B, *Heritage Trail* also includes an interpretive component that will become a community treasure. The *Heritage Trail Plan* updates the facility classifications that were included in the *BikeNet Plan* to be consistent with accepted national standards. While *Heritage Trail* stands alone as a plan for trails and bikeways in the Billings area, by reference it is part of the *2003 Growth Policy* and will serve as the non-motorized component of the *Billings Urban Area 2000 Transportation Plan*.

PUBLIC INVOLVEMENT. *Heritage Trail* is the culmination of a process that involved many people and organizations. It was developed under the authority of the Yellowstone County Planning Board and funded by a transportation planning grant from the Federal Highway Administration. A team of consultants made up of planners, engineers, and landscape architects conducted the planning process. A project steering committee made up of City representatives from various departments and the City Council provided regular oversight of the consultant team. The public was involved through a series of open public meetings and numerous interviews with individuals and interest groups.

AMENITIES. Site amenities and landscaping offer a wonderful opportunity to enhance the character and identity of the *Heritage Trail*. Often overlooked, site amenities can offer trail users points of rest, interpretation, and contemplation resulting in a positive trail experience while providing continuity throughout the trail system. Landscaping also plays an important role in the overall character and feel of a trail. The *Heritage Trail Plan* suggests appropriate site amenities and landscaping that fit the character that is unique to the Yellowstone Valley.

PRIORITIZATION & IMPLEMENTATION. Ideally, *Heritage Trail* would be implemented in its entirety all at once. The realities of funding availability, however, make it necessary to consider the plan as a combination of many projects, both small and large, which ultimately will result in total implementation of *Heritage Trail*. As the process of developing the *Heritage Trail Plan* has evolved, an innovative method for prioritizing potential projects was developed. Many bicycle and pedestrian plans have defined criteria for comparison of proposed projects, but very few have developed a system of prioritization based on objective data and calculations. For the City of Billings, two separate prioritization methods were developed, one for proposed primary on-street bikeways and another for proposed multi-use trails. The goal throughout the development of these methods was to produce a ranking methodology that City/County staff could use as an on-going tool to compare one potential project to another. The criteria used for prioritizing on-street facilities were route continuity, non-motorized travel demand, bicycle compatibility index, and public opinion. The criteria that were used for prioritizing multi-use trails were safety, connectivity/accessibility, route continuity, aesthetics/recreational value, non-motorized travel demand, and public opinion.



Heritage Trail is a vision for Billings' future, and this plan presents a strategy for implementing that vision over the next 10 to 20 years. It should serve as a guide for local governing bodies and City staff as they make decisions, set policy, and prioritize projects and their funding. This document is not intended to be a capital improvements plan, and it is not intended to provide an engineering design or even specific trail alignments. *Heritage Trail*, most importantly, should be a living document that adapts and changes along with the needs of the community. The success of the *Heritage Trail* system is dependent on many different factors. Perhaps the most important factor is broad-based community support from both public and private interests all working together to achieve a common vision. Even with the support of the majority, however, a well-conceived plan backed by real policies and programs is required to ensure implementation.



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1.0 INTRODUCTION

Over the last decade, non-motorized transportation has become an increasingly important component of progressive growing communities across America. Billings, like others, has seen that building more and wider roads to alleviate traffic congestion is a never-ending cycle. Montanans also are not immune to the degenerative effects of the sedentary lifestyle that seems to have become an American epidemic.

In 1994 Billings adopted *BikeNet*, a community-wide non-motorized plan. When it adopted *BikeNet*, Billings took a decisive first step toward achieving a community vision of a city where quality of life is paramount. This vision included implementing a system of trails, paths and bikeways that would invite Billings' citizens to get off their couches and out of their cars. It also included a set of recommendations that addressed policies, land use, education, enforcement and design.

Since the adoption of *BikeNet*, significant achievements have been realized. The City hired an Alternate Modes Coordinator to oversee the implementation of *BikeNet*. Over 10 miles of paved trails have been constructed, and volunteer groups have improved many more miles of natural and soft surface trails along the Yellowstone River. New streets have been constructed with marked bike lanes, and the community has successfully supported the Ales for Trails Festival, which is now an annual event in Downtown Billings to raise money and awareness for trails.

As the number of available trail miles has increased, trail usage and community awareness have increased as well. This has raised new and significant issues related to trail development. How do trails fit within areas of existing development? What are the responsibilities of land developers to accommodate and construct trails in areas of new development? And who pays for trails and bikeways?

NATIONAL POLICY ON BICYCLES AND PEDESTRIANS

Passed in 1991, the Intermodal Surface Transportation Efficiency Act (ISTEA), expressly required Metropolitan Planning Organizations (MPO) across the nation to consider bicyclists in their long-range planning. Recognizing that bicycling and walking play an important role in creating a balanced transportation system, ISTEA set up a new framework for planning, programming, and funding transportation projects. A key provision of ISTEA was a 10% funding set aside from the Surface Transportation Program specifically to pay for "transportation enhancements," including bicycle and pedestrian facilities. ISTEA also opened up several other funding programs previously unavailable to bicycle and pedestrian facilities. On a state and local level, ISTEA required that all states and MPOs prepare long range transportation plans that include bicycling and walking components, and that each state appoint a bicycle and pedestrian coordinator.



The reauthorization of ISTEA, called the *Transportation Equity Act for the 21st Century* (TEA-21), was completed in 1998. TEA-21 continued and improved upon the framework started under ISTEA, mandating that pedestrian and bicycle considerations be made an integral part of the transportation planning process. TEA-21 expires in 2003; the reauthorization of TEA-21, which is now being dubbed the *Safe, Accountable, Flexible and Efficient Transportation Equity Act of 2003* (SAFETEA), should be concluded in 2004.

It is now Federal transportation policy to promote the increased use and safety of bicycling and walking as viable modes of transportation. In 1994 the U.S. Department of Transportation published the *National Bicycling and Walking Study*, which translated this policy into two specific goals: “(1) to double the percentage of total trips made by bicycling and walking from 7.9% to 15.8% of all travel trips; and (2) to simultaneously reduce by 10% the number of bicyclists and pedestrians killed or injured in traffic crashes.” (*National Bicycling and Walking Study: Five Year Status Report*, US Dept. of Transportation April 22, 1999.)

STATE AND LOCAL POLICY

As a result of the ISTEA and TEA-21 mandates, state and local transportation plans have over the past decade become more inclusive of bicycles and pedestrians as viable transportation modes. The *Billings Urban Area 2000 Transportation Plan* provides support to development of bicycle and pedestrian facilities through many of its stated **Community Transportation Guiding Principles**, including the following:

3. The physical organization of the City will be supported by a framework of transportation alternatives that maximizes access and mobility throughout the City, while **reducing dependence on the private automobile**.
6. The City will provide a balanced transportation system recognizing the needs of the wide variety of transit users, drivers, **pedestrians, bicyclists** and all users of the transportation system.
7. Billings will develop and maintain a high quality transportation system incorporating many modes of travel and related systems, including:
 - Roadway network
 - Public parking
 - Transit and paratransit systems
 - **Pedestrian and bikeway facilities**
 - Freight movement – rail and truck
11. Street standards and site planning requirements for development and redevelopment will ensure **direct accessibility by pedestrians, bicyclists**, transit vehicles and cars.
15. **The City will implement the BikeNet program, encourage bicycling as a viable alternative to automobile use for all trip purposes, and ensure safe and convenient facilities with good access to residential neighborhoods and major activity centers.**



25. Billings' transportation system will enable **safe and efficient travel for non-motorized modes** including sidewalks, safe school routes and bicycle networks.
29. Billings will ensure that the transportation system is **sensitive to and mitigates impacts to the environment**, especially in the areas of air quality and noise.

Subdivision and Zoning Policy

Land use and development patterns have a significant impact on mode choice. Development patterns that proliferated during the latter half of the twentieth century included complete segregation of land uses with no intermixing of commercial and residential properties. During this period and in most cases continuing today, residential neighborhood design often includes many cul-de-sacs connected by uninterrupted neighborhood collectors. These types of automobile-centric land use policies and development practices have made alternate modes of transportation – walking, cycling, and public transportation – unrealistic options for most people.

Dolan vs. Tigard. Local governments, and Billings is no exception, often acquire rights-of-way and finance public improvements by exaction of land or cash from developers. This approach, which can be used for trail development as well, has been upheld by the courts as being within the power of local governments. However, the Supreme Court of the United States ruled in *Dolan vs. City of Tigard*, 114 S.Ct. 2309 (1994), that the Government cannot force some people to bear a burden for public improvements that should rightfully be borne by the public as a whole. The Court held that local government could exact property and improvements as long as it demonstrated a “roughly proportional” quantitative relationship between the dedication requirements and the increased demands from the proposed development.

Purpose of Heritage Trail

Heritage Trail is the non-motorized transportation element of the *Billings Urban Area 2000 Transportation Plan*, and serves to update and supercede the former plan known as *BikeNet*. *Heritage Trail* builds on the foundation provided by *BikeNet*, and enhances it in a number of important ways:

- **Larger User Group** – *Heritage Trail* expands the concept of *BikeNet* to embrace a larger constituency of users. No longer just a bike plan, *Heritage Trail* embraces walkers and runners, in-line skaters and skateboarders, equestrians and others.
- **Larger Area** – As a plan for the “Greater Billings Area,” *Heritage Trail* includes links to outlying areas including Laurel, the South Hills, and Lockwood.



- **Stronger Policy** – *Heritage Trail* includes specific policy recommendations that will move the community closer to achieving its vision of a cohesive system of linked trails and bikeways.
- **Celebrates Billings’ Heritage** – More than just a way to get from A to B, *Heritage Trail* includes an interpretive component that will become a community treasure.

Why prepare a plan for non-motorized forms of transportation?

- **To Avoid Missed Opportunities**

This plan will provide community decision-makers with a tool that will inform their decisions so that opportunities are not missed. It’s important that decision-makers not have to face important issues and make critical choices by the seat of their pants, but be able to rely on a well-conceived plan based on extensive community involvement. As the Planning Board, City Council, County Commission, and other bodies consider new land developments or public infrastructure projects, there is often only one opportunity to choose a solution that enhances non-motorized transportation – and that opportunity shouldn’t be missed.

- **To be Eligible for Federal Funds**

Since the adoption of the *Intermodal Surface Transportation Efficiency Act* (ISTEA) in 1991, and subsequent transportation bills (TEA-21), the federal government has legitimized walking and bicycling as transportation modes through higher levels of funding than ever before seen for “transportation enhancements.” Federal policy requires that communities develop and adopt a non-motorized element of their overall community transportation plan in order to be eligible for this funding.

How will the *Heritage Trail* Plan be used?

Heritage Trail is a vision for Billings’ future, and this plan presents a strategy for implementing that vision over the next 10 to 20 years. It should serve as a guide for local governing bodies and City staff as they make decisions, set policy, and prioritize projects and their funding. This document is not intended to be a capital improvements plan, and it is not intended to provide an engineering design or even specific trail alignments. *Heritage Trail*, most importantly, should be a living document that adapts and changes along with the needs of the community.

How does *Heritage Trail* relate to other City plans?

While *Heritage Trail* stands alone as a plan for trails and bikeways in the Billings area, by reference it is part of the *2003 Growth Policy* and will serve as the non-motorized component of the *Billings Urban Area 2000 Transportation Plan*.



Who Developed *Heritage Trail*?

Heritage Trail is the culmination of a process that involved many people and organizations. It was developed under the authority of the Yellowstone County Planning Board and funded by a transportation planning grant from the Federal Highway Administration. A team of consultants made up of planners, engineers, and landscape architects conducted the planning process. A project steering committee made up of City representatives from various departments and the City Council provided regular oversight of the consultant team. The public was involved through a series of open public meetings and numerous interviews with individuals and interest groups.

When will *Heritage Trail* be implemented?

The implementation of *Heritage Trail* has already begun with the development and adoption of this plan. However, the key to making it a sustainable reality is persistent and coordinated efforts by public and private interests. It is critically important that public and private interests both recognize the long-term benefits of a system of trails and bikeways to the health of Billings' citizens and its economy. Only then will development of trails and bikeways become forethought and not an afterthought.

2.0 BENEFITS OF BICYCLE AND PEDESTRIAN FACILITIES

Increased levels of bicycling and walking would result in significant benefits in terms of health and physical fitness, the environment, and transportation-related effects. Bicycle and pedestrian facilities are also often an expression of community pride and character, and in many cases a means of preserving the natural and historical resources of a region. The implications of this trend are also tremendously positive for the general livability of the community. The following sections provide a more detailed discussion and some quantitative insight into the various benefits resulting from the implementation of bicycle and pedestrian facilities.

2.1 SOCIAL BENEFITS

Bicycle and pedestrian facilities enhance the quality-of-life of communities by providing endless opportunities for outdoor recreation. Though less concretely established than some of the other benefits, trails and greenways help promote an increase in social activity. Trails reconnect us to our neighbors by creating a common ground for social interaction. They offer an opportunity for people to get out of their homes and cars and contribute to neighborhood socialization and community unity. They also reconnect us to our families by providing safe and healthy recreation areas for children, parents and grandparents.



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Trails have the potential to help communities build pride by ensuring that their neighborhoods are good places to live, so that children can safely walk or bike to a park or school. Face-to-face interaction with neighbors has been shown to increase a sense of community and reduce crime because neighbors who know each other are more likely to look out for each other and each other's children.

2.2 HISTORICAL & CULTURAL BENEFITS

Trails provide a window into our history and culture by connecting people to the past. They often provide access to and incorporate significant community features, such as historic bridges, buildings, and battlefields. Trails provide a wealth of opportunities for people to learn about the history of people and places.

They have the power to connect us to our heritage by preserving historic places and by providing access to them. They can help provide people with an understanding of the enormity of past events, such as those pertaining to Native Americans. With the connection of places of significant historical interest, opportunities exist for interpretive signs highlighting historic events. Trails are capable of drawing the public to historic sites and are an important part of preserving the past for future generations.



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2.3 ENVIRONMENTAL BENEFITS

Replacing automobile trips with non-motorized and non-polluting bicycling or walking trips has the potential to yield significant environmental benefits. Increased use of non-motorized transportation modes can help communities reduce their levels of carbon monoxide and other pollutants. The greatest environmental benefit of bicycling and walking is that they bypass the fossil fuel system to which the American economy has become accustomed.



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Bicycle riding and walking do not contribute to the environmental damage inherent in extracting, transporting, processing, and burning petroleum or other fossil fuels. Thus, to the extent that bicycling and walking displace trips that otherwise would have involved use of motor vehicles, they enable society to reduce consumption of fossil fuels and the associated pollution.

Automotive transportation is the largest single source of air pollution in the United States. Improving and establishing walkways and trails that connect neighborhoods will create an environment that decreases the number of automobile trips. According to a recent study, a family that walks two miles a day instead of driving will, in one year, prevent 730 pounds of carbon dioxide from entering the atmosphere. Trails and greenways also improve air quality by protecting the trees and other plants that naturally create oxygen and filter out air pollutants.

2.4 TRANSPORTATION BENEFITS

The transportation benefits associated with facilitating non-motorized trips result in a reduction in congestion and lost time. Americans spend tens of millions of dollars purchasing, operating and maintaining automobiles. Road construction and maintenance, oil production, and environmental damage add to the tab. The average car costs about \$3,000 per year to operate plus up to \$2,000 a year on gasoline. Yet studies indicate that 50 percent of all car excursions are less than three miles, a distance that could easily be walked or biked.

Efforts to facilitate bicycling and walking can result in more general transportation benefits besides offering additional travel options for those who are unable to drive or who choose not to drive. Roadway improvements to accommodate bicycles, such as the addition of paved shoulders, have been shown to reduce the frequency of certain types of motor vehicle crashes. Measures to reduce vehicle speeds, which can encourage greater pedestrian activity in residential or downtown shopping and business areas, also have a positive impact on motor vehicle safety.



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Regarding trails as both transportation and recreational facilities encourages the merging of exercise with our daily routine, making it easier to stay healthy and fit. According to statistics derived from the 1995 National Personal Transportation Survey (NPTS), 43 percent of cycling trips are made for purposes other than just recreation (such as work, shopping, school, and personal business). The same survey showed that cycling on an off-road trail facility is generally perceived as safer than riding on sidewalks or streets without bike lanes.

Surveys continue to indicate that as more safe facilities are made available, more people would be willing to use non-motorized transportation for many daily trips that would otherwise be made by car. Trails and on-street bicycle lanes are key elements of this expansion of transportation choices. Various studies have reported that a large percentage of the population would be willing to switch to alternate modes of transportation if adequate facilities were provided.

Many public agencies, as well as prominent advocacy groups, are leading the charge for smarter community design through better choices in transportation spending. One recurring theme is the need for transit-based growth, featuring transit stations that are fully integrated into their surroundings and accessible to as many people as possible. One of the ways to accomplish this integration and accessibility is through incorporation of trails as “feeder



systems” for transit. Many environmentalists and urban planners agree that regional transportation systems that rely exclusively on the automobile are increasingly detrimental to both quality of life and community budgets.

2.5 HEALTH BENEFITS

Trails have been built and maintained in this country mainly for reasons related to transportation and recreation. Rarely, however, have people questioned the importance of trails to our health and well-being. These facilities offer adults and children alike the opportunity to integrate moderate exercise with daily trips to work or school. There is strong scientific evidence that regular physical activity promotes health and reduces risk of many diseases and premature death. Such moderate exercise has been proven to reduce the risk of developing coronary heart disease, diabetes, obesity, and several other medical conditions. Public health officials and community planners throughout the country are rethinking our vehicle-friendly communities and seeking to design developments and retrofit established communities to encourage outdoor physical activity.

According to the Surgeon General’s Report on Physical Activity and Health, 60% of Americans are not regularly active and another 25% are not active at all. This report also suggests that creating safe places for people to bicycle and walk are critical to persuading inactive people to become more active. Individuals must choose to exercise, but communities can make that choice easier by providing attractive and safe networks of sidewalks, bikeways and trails.

Dr. William Dietz, director of the Division of Nutrition and Physical Activity for the Centers for Disease Control and Prevention in Atlanta, said most communities designed since World War II are unfriendly to pedestrians and cyclists. “A quarter of all trips taken by Americans are under a mile, but 75 percent of those trips are done by car,” he noted.



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Trails create healthy recreation and transportation opportunities by providing people of all ages with attractive, safe, accessible and low or no cost places to bike, walk, hike, jog or in-line skate. In doing so, they make it easier for people to engage in physical activity. They provide natural, scenic areas that cause people to actually want to go outdoors and be physically active. In this age of expensive indoor gyms and health clubs, trails offer much more cost-effective places to exercise.

Bicycling and walking provide additional benefits related to physical health and quality of life by reducing health care costs. According to a National Parks Service study on the Economic



Impacts of Protecting Rivers, Trails, Greenway Corridors, people who exercise regularly have 14 percent lower claims against their medical insurance and spend 30 percent fewer days in the hospital.



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In a recent report on physical activity and health, the U.S. Department of Health and Human Services (HHS) addressed the national public health crisis stemming from physical inactivity. According to HHS, “approximately 300,000 U.S. deaths a year are associated with obesity and overweight.” The Surgeon General recommends moderate physical activity – 30 minutes a day, five days a week – to combat the threat of diseases including high blood pressure, coronary heart disease, Type 2 diabetes, certain forms of cancer and depression. With the Surgeon General and HHS, the White House

recognizes the need for physical activity and launched the “Healthier U.S. Initiative” fitness campaign designed to educate and inspire Americans to be active. Trails figure prominently in the fight against obesity and inactivity.

The National Center for Chronic Disease Prevention and Health Promotion (CDC) recognizes the positive impact that trails can have on the overall health of their users. There is now scientific evidence that providing access to places for physical activity increases the level of physical activity in a community. The Task Force on Community Preventive Services strongly recommends creating or enhancing access to trails and other places for physical activity. However, just building trails is not enough, the Task Force highlighted that communication strategies and outreach activities that promote using trails and facilities are also recommended. A typical study of an intervention to create or enhance access to places for physical activity reports a 25% increase in physical activity levels.

Another overlap between transportation and health stems from the mode that children use to get to school. Today, about 10 percent of kids between the ages of 5 and 15 walk to school. This is down from more than 50 percent in the 1960s. This decline is perhaps one reason why obesity rates in children have risen dramatically in the last twenty years. From the mid-1970s to the mid-1990s, the percentage of trips that children made on foot declined



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from about 15 percent to 10 percent. During the same period, the percentage of children who were considered overweight rose from 6 percent to 14 percent.

Individuals must choose to exercise, but communities can make that choice easier. Lack of time or access to convenient outlets for healthy transportation and recreation opportunities are reasons commonly cited as barriers to regular exercise. Communities can use trails as a tool to help make exercise more convenient and neighborhoods more exercise-friendly. According to the results of a study in Indiana, for all seven trails analyzed, at least 70 percent of users indicated that their participation in some form of physical activity has increased due to the trail.

2.6 ECONOMIC BENEFITS

An organized trail system is a desirable amenity and can contribute to the economic vitality of the community. Revenue generated from trail-related recreation and activities provide substantial income and employment opportunities. Well-managed trails running through communities can foster substantial, sustainable economic activity through business development and tourism. Trails encourage the establishment of “clean” industries and businesses



www.k12s.phast.umass.edu/~spac/eco.html

such as cafes, bike shops, and bed & breakfasts in communities along the trail. Increased property values and tourism and recreation-related spending on items such as bicycles, in-line skates and lodging are just a few of the ways trails have a positive impact on local economies. The economy can also benefit from retention of businesses due to increased quality of life for employees that lead to reduced employee turnover. Trail systems also benefit communities by reducing costs related to transportation. According to a National Bicycling and Walking Study, the American public saves from 5 to 22 cents for every mile not traveled in an automobile. This savings is attributable to reduced pollution, oil import costs, and costs due to congestion, such as lost wages and lost time on the job.



www.railtrails.org

BUSINESS ATTRACTION

Bicycle and pedestrian facilities also attract high-quality businesses by providing commuting options for employees and scenic places for stress-free strolls at lunchtime. Choosing a location that will help attract and retain key personnel has been cited as the number one factor in selecting office locations. Corporate real estate executives agree that employee “quality of life” issues are as important as cost when deciding where to locate a new office building. A National Park Service study revealed that the total economic impact of a trail involves a combination of newly created trail-related jobs (construction and maintenance) and the expansion of existing businesses related to travel, equipment, clothes, food, souvenirs, and maps. The economic potential is astounding considering there are millions of trail users per year.

PROPERTY VALUE

Trails are becoming common in many residential neighborhoods across the United States. Development plans for homes, apartments, and townhouses often include footpaths to enhance recreational opportunities *and* property values. Real estate agents regard urban trails as an amenity that helps to attract buyers and to sell property. Trails are considered lifestyle enhancements and are usually included in the sales package for a property.



www.nps.gov/pwro/rta/propval.htm

Homebuyers have begun to recognize the benefits of bicycle and pedestrian facilities and are showing a preference for properties close to those facilities. According to a 1994 study done by American Lives, “walking and biking paths” ranked third among 39 features identified by homebuyers as important factors in their home buying decisions. A nearby trail not only makes properties easier to sell, but has also been proven to increase the value of those properties.



According to a brochure put out by the Florida Department of Environmental Protection, people who own property bordering a proposed greenway sometimes are concerned that development of a trail will lower their property values and lead to increased crime. But studies consistently show that trails often increase the value of property near a greenway. The studies that support these statements are the 1995 study of greenways in the metropolitan Denver area, the 1987 study of the Burke-Gilman Trail in Seattle, the 1994 study of two Minnesota rail-trails, and the 1992 National Park Service study that looked at three trails in Florida, Iowa and northern California.

According to the study done in the Denver metropolitan area on the effects of trails and greenways on property values, 35 percent of residents believed the existence of the trail near their home would increase the selling price and 46 percent felt it would make their home easier to sell or rent. As part of the same study, a survey of real estate agents in the area found that 82 percent used the trail as a selling point and that 91 percent felt that homes located next to the trail would be easier to sell than homes not located next to the trail. None of the real estate agents surveyed felt that the trail would have a negative effect on the value of the property. The results from the survey clearly point to the trail being an aid in selling a home, rather than a detriment. Trails are often considered an amenity or quality of life enhancement in reference to purchasing a home.



www.trailsandgreenways.org/photos

Studies in other regions have validated the findings of the Denver study. For example, a similar study was performed in Seattle, Washington on the Burke-Gilman Trail with the objective of determining the effect that a bicycle and pedestrian trail has had on property values and crime rates on property near and adjacent to the trail. The study was conducted in response to property owners concerns, in a different area of town, over a new trail development in their neighborhood. Results of the survey showed that property near the trail is

significantly easier to sell and, according to real estate agents, sells for an average of six percent more as a result of its proximity to the trail. The conclusion of this study is that this particular rail-trail is an amenity that helps sell homes and increases property values. The study also found that the trail has had little, if any, effect on crime and vandalism experienced by adjacent property owners, and that there is a very high level of public support and acceptance of the trail.

In another study of two rail-trails in Minnesota, 87 percent of landowners surveyed believed the trails did not have a negative impact on the value of their property. Overall, studies generally conclude that the average value of a home adjacent to a trail would be considerably higher than the same property not adjacent to a trail.



The National Park Service and Pennsylvania University performed an economic analysis of three rail-trails in Iowa, Florida and California. Landowners along all three trails reported that their proximity to the trails had not adversely affected the desirability or values of their properties and the majority of owners felt the presence of the trail would make their properties easier to sell and at increased values. The number of real estate professionals interviewed who felt the trails increased property values outnumbered those reporting decreased values. In addition, results of this analysis showed that the average overall economic activity associated with these three trails was \$1.5 million annually.

Another analysis was performed on the economic impact of a rail-trail in Ashland, Maryland. Several developers with projects in the area felt the trail may have increased the value of their units. The greatest value that the trail adds to nearby properties according to developers and brokers is the increased salability of listings. Hence, if two identical properties are for sale and one is near the trail and the other is not, the trail is used as a selling point and helps many nearby owners sell their property faster.

A land developer from Front Royal, Virginia donated a 50-foot wide, seven-mile easement for the Big Blue Trail in northern Virginia after volunteers from the Potomac Appalachian Club approached him to provide a critical trail link along the perimeter of his second-home subdivision. The developer recognized the amenity value of the trail and advertised that the trail would be adjacent to approximately 50 parcels and all lots were sold within four months.

In general, this increase in property value also results in increased property tax revenues for local governments. Many arguments made for parks and trails investment claim these acquisitions pay for themselves in a short period of time, due in part to increased property tax revenues from higher values of nearby property.

2.7 REFERENCES

1. *Active Communities: How Trails Benefit your Neighborhood.* American Hiking Society. www.americanhiking.org.
2. *Analysis of Economic Impacts of the Northern Central Rail Trail.* PKF Consultants. June 1994.
3. *Benefits of Trails.* Rails-to-Trails Conservancy. <http://www.railtrails.org/benefits>
4. *Benefits of Trails and Greenways.* Trails and Greenways Clearinghouse. <http://www.trailsandgreenways.org>.
5. *The Economic Benefits of Trails.* American Hiking Society. www.americanhiking.org.
6. *Economic Benefits of Trails and Greenways.* Trails and Greenways Clearinghouse. <http://www.trailsandgreenways.org>.



7. *Economic Impacts of Protecting Rivers, Trails, and Greenway Corridors.* Rivers, Trails and Conservation Assistance. National Parks Service. 1995. Fourth Edition, Revised.
8. *The Economic and Social Benefits of Off-Road Bicycle and Pedestrian Facilities.* National Bicycle and Pedestrian Clearinghouse (NBPC) Technical Brief. September 1995.
9. *The Effect of Greenways on Property Values and Public Safety.* The Conservation Fund and Colorado State Parks, State Trails Program. March 1995.
10. *Enhancing the Environment with Trails and Greenways.* Trails and Greenways Clearinghouse. <http://www.trailsandgreenways.org>.
11. *The Environmental Benefits of Bicycling and Walking.* Case Study No. 15. National Bicycling and Walking Study. U.S. Department of Transportation Federal Highway Administration (FHWA). Publication No. FHWA-PD-93-015.
12. *Evaluation of the Burke-Gilman Trail's Effect on Property Values and Crime.* Seattle Office for Planning. Seattle, Washington. May 1987.
13. *FHWA Course on Bicycle and Pedestrian Transportation.* U.S. Department of Transportation Federal Highway Administration (FHWA). <http://www.fhwa.dot.gov/safety/pedbike/univcourse/swtoc.htm>.
14. *Health and Wellness Benefits.* Trails and Greenways Clearinghouse. <http://www.trailsandgreenways.org>.
15. *Health Programs and Trails.* American Trails Website. <http://www.americantrails.org/resources/benefits/HealthTwoArtic.html>.
16. *The Impacts of Rail-Trails: A Study of Users and Property Owners from Three Trails.* National Park Service and Pennsylvania University. Rivers, Trails, and Conservation Assistance Program. Washington, D.C. 1992.
17. *Preserving Historic and Cultural Resources.* Trails and Greenways Clearinghouse. <http://www.trailsandgreenways.org>.
18. *Promoting Physical Activity Through Trails.* National Center for Chronic Disease Prevention and Health Promotion (CDC). <http://www.cdc.gov/nccdphp/dnpa/physical/trails.htm>.
19. *Thinking Green: A Guide to the Benefits and Costs of Greenways and Trails.* The Office of Greenways and Trails. Florida Department of Environmental Protection. October 1998.



3.0 THE PLANNING PROCESS

The *Heritage Trail Plan* consists of two primary components, 1) an update to the 1994 *BikeNet Plan*, and 2) the development of comprehensive design standards for the trails system.

Heritage Trail began in October 2002 as an update to the 1994 *BikeNet Plan*. Since the adoption of *BikeNet*, significant progress has been made in education, awareness and implementation of trails. However, while many of *BikeNet's* initial goals have been achieved, the growing community support for trails in and around the greater Billings area has driven the need for this update.

BikeNet was truly a pioneering document for the Billings community, educating the community on the importance of trails and leaving a lasting legacy of community interest groups and built trails that have set a positive tone for future development of the trails system. *Heritage Trail* recognizes the work that was developed through the *BikeNet Plan* and builds on a community-based planning process that had public participation and input as its cornerstone.

3.1 THE STEERING COMMITTEE

The development of the *Heritage Trail Plan* was guided by a Steering Committee that met periodically throughout the planning process to provide input and guidance to the consultant team and to review and refine the team's work at key milestones. The Steering Committee was made up of City staff from the Planning, Public Works, and Parks Departments, City Administration, and the City Council.

The Steering Committee charged the planning team with the following objectives:

- Broaden the trails plan to appeal to a wider range of users
- Develop a document that offers a stronger policy for trail implementation
- Involve the community in the development of the plan
- Identify key corridors for trail development
- Develop a comprehensive set of design standards for trails and bikeways

3.2 COMMUNITY INVOLVEMENT

Throughout the planning process, the *Heritage Trail* planning team reached out to groups and individuals throughout the community to gather ideas and listen to issues. This process included three public forum meetings, written surveys, and numerous meetings with groups such as the Yellowstone River Parks Association (YRPA), BikeNet, Blue Creek Trails and Parks Association, Yellowstone Valley Cycling Club, Yellowstone Rim Runners, City of Billings Department of Planning, Department Public Works, Department of Parks, Recreation and Public Lands, Lockwood Transportation District, and community service groups including



Kiwanis and the Billings West End Rotary Club. A complete list of public meeting participants is included in Appendix A.

The overwhelming theme with all of these groups was that trails do benefit our community's quality of life and should be implemented with the highest priority. A strong corollary to this was the often expressed fear that the plan, once adopted, would simply be put on a shelf and never implemented. As well, there were citizens that expressed concerns about trail development and its impact on personal property rights, and there were those that supported trails overall but "not in my back yard." While this issue is sensitive in certain parts of the planning area, it is not the intent of this document to identify and resolve specific trail alignment issues. It is the intent of this document to identify a comprehensive network of trails and bikeways, which focuses primarily on important corridors and key connections; establish community specific design standards and make implementation recommendations. Specific trail alignments will be identified during design and engineering of specific trail segments as funding becomes available.

3.3 A NEW IDENTITY

As the process was developed to update *BikeNet*, early on it was recognized that the original plan was narrowly focused on bicycle users and did not focus on the opportunities and interests of a multi-user trails system. The team's first task was to create a new identity for the plan that would appeal to a broader spectrum of trail users.

The planning team explored opportunities for the trail system to be not just a functional and recreational system but also one that offered interpretive opportunities. As trail corridors were identified and evaluated, it became evident that there were numerous cultural and historical places and events that offered a look back to our rich "Heritage" that could be identified, accessed and interpreted. This idea grew into the driving force behind the new identity of the trails system – *Heritage Trail*.

3.4 GOALS AND OBJECTIVES

To guide the development of the plan, the planning team and the Steering Committee working together developed a set of goals and objectives. These were then refined based on public review and comment.



Goals of the *Heritage Trail Plan*:

1. The *Heritage Trail Plan* will be a comprehensive multi-use trails plan that serves the Greater Billings community and emphasizes:
 - Safety
 - Implementation
 - Preservation
 - Conservation
 - Interpretation
 - Recreation
 - Transportation
 - Access
 - Education
 - Utilization
 - Cost Effectiveness
 - Maintenance

2. The *Heritage Trail Plan* will be consistent with:
 - *Yellowstone County Growth Policy Plan*
 - *City of Billings Transportation Plan*
 - *City of Billings Parks Plan*

3. The *Heritage Trail Plan* will create links throughout Yellowstone County connecting communities, neighborhoods, natural and cultural features, commercial and employment centers, schools and parks.

Short-Term Objectives of the *Heritage Trail Plan*:

1. The *Heritage Trail Plan* will involve the greater Billings Community.
2. The *Heritage Trail Plan* will develop a vision and identity for the trails network in the Greater Billings Area.
3. The *Heritage Trail Plan* will provide an implementation strategy for the trails network in the Greater Billings Area.
4. The *Heritage Trail Plan* will be accepted by the Community and adopted by the City of Billings and Yellowstone County.



4.0 STUDY AREA CHARACTERISTICS

This chapter provides a profile of the socio-economic characteristics relevant to bicycle and pedestrian travel for the City of Billings and Yellowstone County. It also provides discussion on other topics pertaining to bicycle and pedestrian travel, including trip generators, barriers, current non-motorized activity, maintenance, transit, bicycle parking facilities, and safety.

4.1 STUDY AREA PROFILE

Located in south central Montana, Yellowstone County is Montana’s most populous with 129,352 residents, according to the 2000 Census. Billings, the state’s largest city, has a population of 89,847 and is a major retail, financial, energy, transportation and medical center. Table 4.1.1 shows population trends and projections for the City of Billings and Yellowstone County. It should be noted that this table was created prior to the 2000 Census and the populations listed for the year 2000 were based on projections.

Table 4.1.1. Population Trends & Projections

Jurisdiction	1970	1980	1990	1996	2000	2010	2020
City of Billings	61,581	66,798	85,073	91,500	96,736	107,389	118,000
Billings Urban Area	77,098	91,714	94,724	100,460	104,284	114,667	123,127
Yellowstone County	87,367	108,035	113,419	120,890	122,747	137,198	148,978
Billings % of County	70.5%	61.8%	75.0%	75.7%	78.8%	78.3%	79.2%
Billings 10-yr. % Growth		8.5%	27.4%	7.6%	13.7%	11.0%	9.9%
County 10-yr. % Growth		23.7%	5.0%	6.6%	8.2%	11.8%	8.6%

Source: *Billings Urban Area 2000 Transportation Plan*

Although Yellowstone County residents experience four distinct seasons, they usually avoid the extremes of both cold and heat. According to the National Climatic Data Center, the average daily low in January is 14 degrees Fahrenheit with an average of 8 days of snowfall. The average daily high in July is 87 degrees Fahrenheit. The wettest month typically is May with an average of 11 days and 2.57 inches of rainfall. Table 4.1.2 shows detailed average temperatures and precipitation for each month from the National Climatic Data Center. Averages are computed from data recorded during the period of 1961 to 1990. The record highs and lows are through the year 2000.

Although the relative flatness of Yellowstone County’s terrain contributes to an environment conducive to bicycling and walking, this topography has also created conflicts for residents. Since 1997, the county has experienced more than ten floods, most of which occurred in the Billings area. Table 4.1.3, also from the National Climatic Data Center, describes the flood history of Yellowstone County since 1997. Flooding causes a decrease in usage and an



increase in maintenance required for on-street and off-street trails, specifically those located along river corridors and drainage ditches. Therefore, issues associated with flooding should be considered and addressed during the design process.

Table 4.1.2. Average Temperatures and Precipitation for Billings

Month	Avg. High	Avg. Low	Record High	Record Low	Avg. Precip.(in.)	Rain/Snow Days
January	32°	14°	68°	-30°	0.90	8
February	39°	19°	72°	-38°	0.64	7
March	46°	25°	79°	-19°	1.16	9
April	57°	34°	92°	-5°	1.74	10
May	67°	43°	96°	14°	2.57	11
June	78°	52°	105°	32°	1.99	11
July	87°	58°	106°	41°	0.94	7
August	85°	57°	105°	35°	1.01	6
September	72°	47°	103°	22°	1.36	7
October	61°	38°	90°	-7°	1.14	6
November	45°	26°	77°	-22°	0.84	6
December	34°	17°	69°	-32°	0.79	7

Source: National Climatic Data Center

Table 4.1.3. Yellowstone County Flood History

Location	Date	Description
NW of Billings	Jan. 3, 1997	An ice jam broke on Yellowstone River, flooding several mobile homes and cars.
SW of Laurel	Feb. 2, 1997	An ice jam caused Clark Fork River to flood a ranch and several fields and damage a road.
SE Montana	June 1, 1997	Caused by record snow pack, heavy rains and unusually warm temperatures. Resulted in an estimated \$2.2 million in damage in Yellowstone County.
Billings	June 8, 1997	Emergency traffic only in downtown Billings with most city streets full of water.
Billings	July 8, 1997	Two and a half feet of water near Metra Park at intersection of Main and First Street.
Billings	July 30, 1998	A strong thunderstorm produced street flooding on 14 th Street between Lewis and Clark.
Billings	July 31, 1998	Street flooding reported throughout Billings. Several underpasses were flooded and a dozen manhole covers were flooded off.
Billings	Oct. 2, 1998	Street flooding in downtown on Montana Ave. and 27 th Ave. Flooding did not produce any significant damage.
N of Billings	June 26, 2001	Caused by two severe thunderstorms. Flash flooding was observed over much of eastern Yellowstone County, including downtown Billings.
Billings	July 17, 2001	Flash flood causing street flooding on the south side of Billings.

Source: National Climatic Data Center



4.2 TRIP GENERATORS

A goal of the *Heritage Trail Plan* is to provide a safe, accessible, and continuous network of non-motorized trails throughout the Greater Billings Area that connects neighborhoods with major trip generators, such as schools, shopping and business centers, and recreational opportunities. This is achieved by considering major trip generators that would potentially attract the bicycling and walking public and by providing trail connections to these locations. The *Heritage Trail Plan* will create links connecting communities, neighborhoods, natural and cultural features, commercial and employment centers, schools and parks. Potential bicycle and pedestrian trip generators identified in the Billings area are included in Appendix B.

4.3 BICYCLE AND PEDESTRIAN BARRIERS

Obstacles to non-motorized travel can be separated into two groups: absolute barriers and bicycle and pedestrian impediments. Absolute barriers include rivers, lakes, railroad tracks, and interstate highways. However, it should be recognized that certain barriers such as rivers and abandoned railroad corridors could also provide excellent transportation and recreational opportunities for multi-use paths. Bicycle and pedestrian impediments are obstacles that can be crossed, but only with some difficulty and include high traffic streets, steep grades, and interstate interchanges.

More specific to Yellowstone County, absolute barriers include Interstates 90 and 94, Yellowstone River, the Rimrocks, and the Montana Rail Link railroad corridor. Bicycle and pedestrian impediments include major arterials (Main Street, King Avenue, etc.), all the interchanges along I-90 (Shiloh Road, West Billings, South Billings Boulevard, South 27th Street, Lockwood, and Johnson Lane), and large irrigation canals.

4.4 CURRENT NON-MOTORIZED ACTIVITY

Table 4.4.1 shows the transportation mode breakdown for people traveling to work for the City of Billings and Yellowstone County, according to the U.S. Census 2000. As shown in Table 4.4, Yellowstone County accounts for 7 and 8 percent of Montana residents that walk or bike to work, respectively. A very high percentage of these people reside in the City of Billings (74 and 91 percent).



Table 4.4.1. Means of Transportation to Work for Workers 16 Years and Over

Mode	Montana	Yellowstone County		City of Billings		
		Total	% of MT	Total	% of MT	% of Yellowstone Cnty
Total	422,159	64,697	15.3	45,013	10.7	69.6
Drove alone	311,872	52,635	16.9	36,855	11.8	70.0
Carpooled	50,192	6,367	12.7	4,331	8.6	68.0
Public Transportation	2,812	707	25.1	532	18.9	75.2
Motorcycle	338	16	4.7	14	4.1	87.5
Bicycle	4,049	326	8.1	297	7.3	91.1
Walked	23,336	1,645	7.0	1,213	5.2	73.7
Other means	2,649	366	13.8	223	8.4	60.9
Worked at home	26,911	2,635	9.8	1,548	5.8	58.7

Source: U.S. Census 2000

A trail system survey was recently conducted by the City of Billings and 208 residents responded. The purpose of the survey was to determine how many people were using the existing trail system and to acquire public input for future trails. The results are as follows:

- 76% of respondents have used the Billings trail system.
- 65% use the trail system randomly; 17% use it several times a week; 8% use it once a week; and 10% use it once a month.
- 55% use the trail for recreational/outdoor activities; 39% use it for exercise; and 6% use it as a transportation/commuter route.
- The modes of transportation used on the trail system consist of walking (46%), biking (40%), running/jogging (7%), and inline skating (7%).
- 25% of users live within 1 mile of the trail system; 52% live within 1 to 5 miles; and 23% live greater than 5 miles away from the system.
- 85% would use the trails more frequently if they were closer to their home or neighborhood.
- 78% would consider biking or walking to work or to run errands if the trail system (off-street) and bike lanes (on-street) were more adequate for their needs.
- The survey also resulted in the following list of priorities for trail users, in order of importance:
 1. Separation from vehicular traffic
 2. Recreational opportunity
 3. Scenery
 4. Safety
 5. Hard Surface
 6. Connection
 7. Social Interaction

- The following is a list of desired improvements for the existing trails. Although the list is not in order of importance, the issues of “connections,” “access,” and “amenities” were most commonly listed as the highest priority.
 1. Connections
 2. Access
 3. Amenities
 4. Safety
 5. Maintenance
 6. User Conflict
 7. Landscaping
 8. Lighting
 9. Signage
 10. Parking Facilities
 11. Hard Surface

4.5 MAINTENANCE

Maintenance is essential to ensure user safety and to encourage increased use of Billings’ non-motorized trail system. Funding allocated for the maintenance of the Billings’ trail system was approximately \$9,000 for the 2003 fiscal year, which is a separate part of the budget for the Department of Parks, Recreation, and Public Lands (PRPL). The source for this funding is the City of Billings general fund.

Maintenance includes repairs made to the surface of the bicycle or pedestrian facilities, tree trimming, weed control, snow removal, and sweeping. Minimal surface repairs are being made to the Billings trail system at this time, although the need will increase as more trails are constructed and existing trails weather and age. As needed during the growing season, PRPL trims trees and mows within 8 feet each side of the trails. Noxious weeds are controlled with spot treatments where weeds cannot be mowed, around posts and along fences. Snow removal is currently performed with a blade and sweeping is performed with a landscaping tractor attachment. Litter is removed twice per week during summer months and every other week during the off-season.

Sign maintenance and vandalism repairs are also included in maintenance duties. Existing signage on Billings’ trails consists mainly of safety, regulatory and street or access signage installed after construction. Vandalism repairs consist mainly of the removal of graffiti and cleaning and sweeping up broken glass. Signs are also replaced and damage to access control is repaired as needed.

4.6 TRANSIT

Transit has become an integral component of the bikeway system in Billings by providing bicycle racks for transport on buses. Transit allows bicyclists to extend their trip length by creating a shared multi-modal trip. Bike rack usage on MET coaches is limited to two (2) bikes at a time. Riders are responsible for loading and unloading their own bicycles from the racks located on the front bumper of the MET coach. For safety reasons the MET Operator cannot leave the coach to assist cyclists. Written procedures for loading and unloading bicycles are available from the drivers. According to MET Transit, these bike racks were used 11,560 times in 2002.



www.ci.billings.mt.us/met

4.7 BICYCLE PARKING FACILITIES

An inventory of existing parking facilities was performed at various bicycle trip generators across Billings. Specifically, this data was collected at Rocky Mountain College, MSU-Billings, Rimrock Mall, Downtown, the Medical Corridor, Terry Park, North Park, Pioneer Park, Riverfront Park, Stewart Park, and the MET Transfer Center adjacent to Stewart Park. A few examples of the bicycle parking facilities found across the City of Billings are illustrated in Figure 4.7.1.

Figure 4.7.1. Example Bicycle Parking Facilities



Photos by Engineering, Inc.



Although adequate parking facilities were found at Rocky Mountain College, MSU-Billings, and Rimrock Mall, according to recent studies several of the types of parking facilities at these locations are considered sub-standard. Of the parks that were included in the inventory, Stewart Park was the only one that provided bicycle-parking facilities. Parking facilities were located downtown, but for a retail and employment center of this size, additional facilities should be provided. The Medical Corridor near downtown Billings was also evaluated for parking facilities. Very few were found and it was observed that several bicyclists had been forced to lock their bikes up to street lamp poles. Even though it is potentially a major link between alternate modes of travel, the MET Transfer Center near Stewart Park does not currently provide any bicycle parking facilities.

According to the Pedestrian and Bicycle Information Center, more than 1.5 million bicycles are reported stolen every year in the United States and fear of bicycle theft is recognized as a significant deterrent to bicycle use. The availability of safe and convenient parking is as critical to bicyclists as it is for motorists and yet it is frequently overlooked in the design and operation of shops, offices, schools, and other buildings.

4.8 SAFETY

According to a study recently released by the Montana Livable Places Campaign, there are seven times as many fatal pedestrian and bicycle crashes as there are fatal car-train crashes in the State of Montana. However, much more attention is focused on improving railroad crossings and teaching safe crossing practices than is given to improving safety conditions for pedestrians or bicyclists.

Accident data involving bicycles and pedestrians from January of 1999 to December of 2001 was acquired from the City of Billings Traffic Engineering Division. Figures 4.8.1 through 4.8.3 illustrate the accident data by time day, day of week, and month, respectively. As shown in Figure 4.8.1, the greatest number of pedestrian accidents occurs at the end of the school day, between 3 and 4 pm, and the greatest number of bicycle accidents occurs at the end of the workday, between 5 and 6 pm. A high number of both accident types also occur between 1 and 2 pm, the time when many people return to school or work after lunch.

As shown in Figure 4.8.2, the majority of bicycle and pedestrian accidents occur during the week. The number of accidents decreases significantly over the weekend, which is likely due to an overall decrease in traffic. The average number of pedestrian accidents reaches its peak on Thursday, while bicycle accidents peak on Friday.

As illustrated in Figure 4.8.3, the average number of accidents involving bicycles and pedestrians is higher overall during the spring and summer months. This can be expected when the weather is nice and people are more likely to choose alternate modes of travel. There are a higher number of bicycle accidents in May, June and July, while the greatest number of pedestrian accidents occurs in April and August.

Figure 4.8.1. Pedestrian and Bicycle Accidents by Time of Day

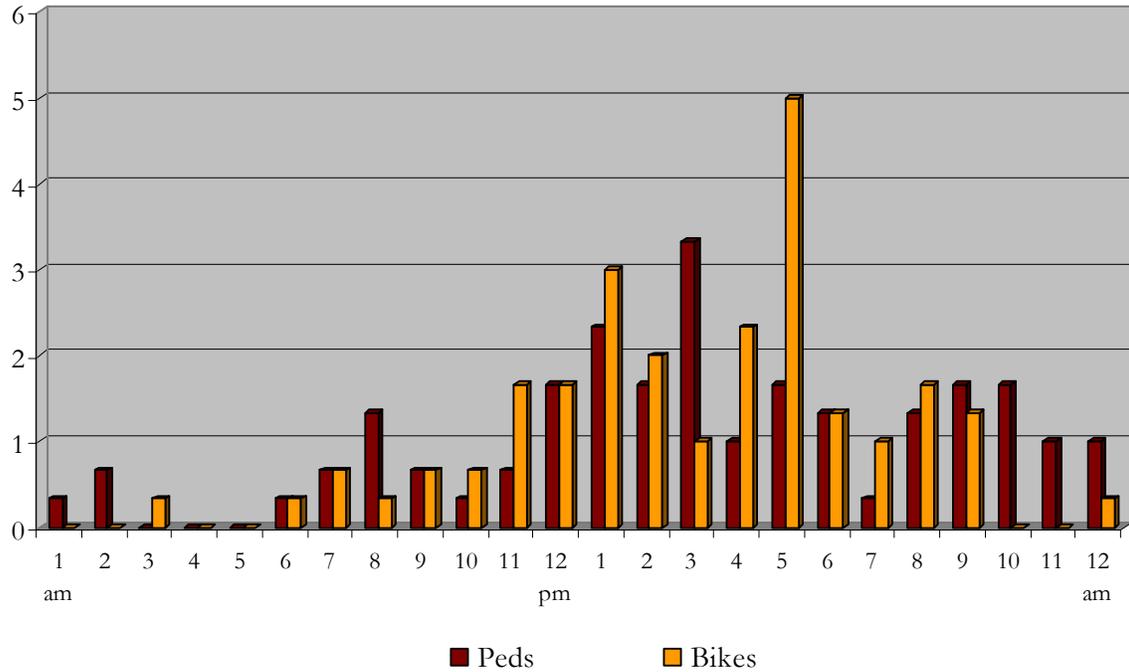


Figure 4.8.2. Pedestrian and Bicycle Accidents by Day of Week

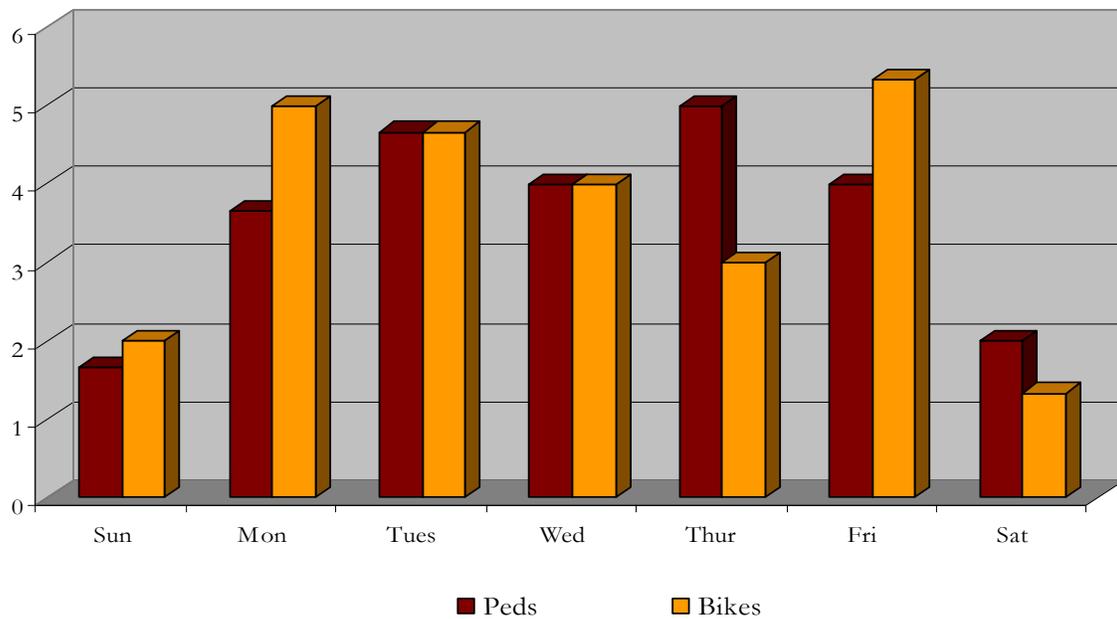
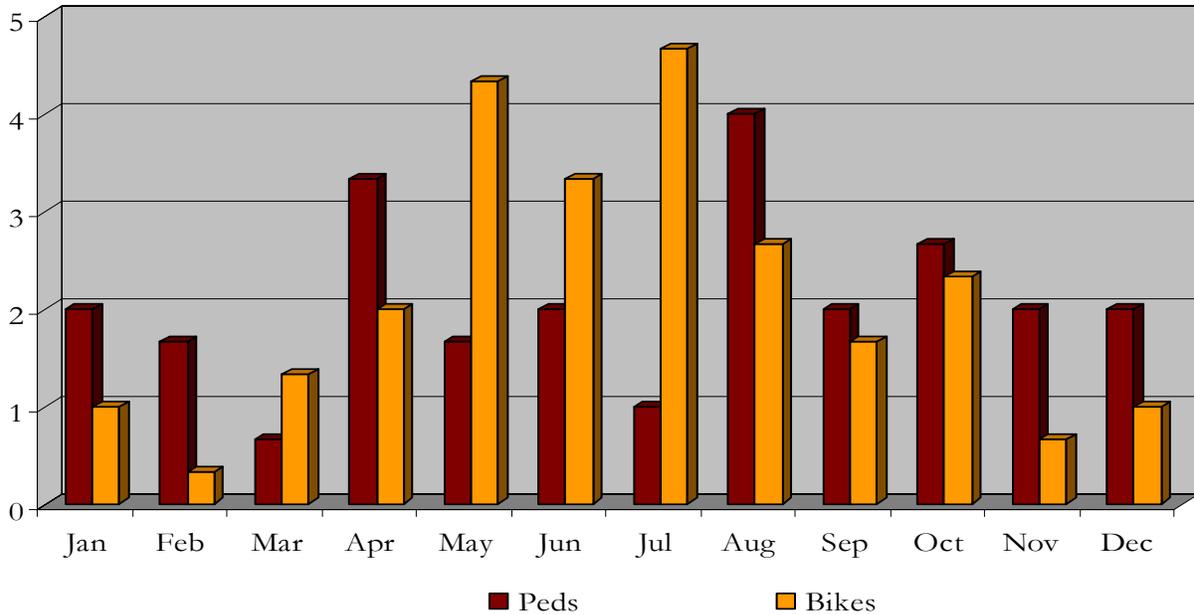


Figure 4.8.3. Pedestrian and Bicycle Accidents by Month



According to a study done by the Montana Livable Places Campaign, the number of injury crashes involving bicyclists and pedestrians are significantly under-reported. Because they are not required to file insurance claims, accidents involving bicyclists commonly go unreported. The effect is most notable when comparing emergency room data to the data contained in police records. Studies have shown that approximately 90 percent of those bicycle crashes that send someone to an emergency room are never reported to the police. Assuming this figure is accurate, bicycle injury crashes would account for as many as 25 percent of all injury crashes in the State of Montana, or six times as many as are currently being reported.

Although not as much data is available for crashes involving pedestrians, the pattern is reported to be similar. Only about 20 percent of pedestrian injury crashes show up in the reports and the subsequent statistics for the State of Montana. Accurate reporting of pedestrian accidents would likely result in 10 to 13 percent of the total number of injury accidents in Montana, approximately four times as many as reported in recent statistics.

Accounting for unreported bicycle and pedestrian injury crashes would likely increase the percentage of non-motorized injury crashes to between 20 and 30 percent of Montana’s total. Therefore, it is likely that the data presented in the previous figures significantly underestimates the actual number of accidents involving bicyclists and pedestrians in the City of Billings.

According to the December 2002 edition of *Newsline*, published by the Montana Department of Transportation (MDT), House Joint Resolution 37 called for a study of bicycle safety that encompasses the planning, design, and construction of Montana’s highways; programs or



requirements for driver education, training or licensing; and safety equipment and clothing for cyclists. A consulting firm has conducted the study with technical support from an advisory panel that includes legislators, bicycle advocates, local government, local and state law enforcement, driver education, and the Motor Carriers Association.

In Montana, bicyclists are required to follow the same rules of the road as motorists. They are expected to ride safely, be courteous to other roadway users, and abide by all Montana traffic laws. Bicyclists are to ride upon a street single file except on paths or parts of streets set aside for the exclusive use of bicycles. Bicyclists shall not carry any article that prevents them from keeping one hand upon the handlebars. All bicycles in use at night should be equipped with a strong white headlight that emits light visible from a distance of at least 500 feet. They should also be equipped with a colorless front-facing reflector; colorless or amber pedal reflectors and a red rear-facing reflector. A red taillight may be used in addition to rear-facing reflectors. All bicycles in use at night should also be equipped with either tires with retro-reflective sidewalls or reflectors mounted on the spokes of each wheel.

In order to spread the word that we need to be respectful of all roadway users, the Montana Department of Transportation (MDT) and the Montana Highway Patrol have developed posters and bumper stickers to remind people to “Share the Road.” The posters and bumper stickers are available from MDT at no charge.

Bicycle helmets are a proven way of reducing the death and injury toll from bicycle crashes. A recent amendment to the Billings City Code addresses the laws related to the use of bicycle helmets. These additional sections require that all individuals under the age of sixteen wear protective helmets while operating a bicycle within the city limits. The code also requires that all bicycle rental businesses provide protective helmets and that all bicycle helmets for sale be conspicuously labeled, establishing a protective helmet bank and providing a penalty for violations.

In order to increase safety in school zones, the City of Billings has adopted a policy on “School Zone Traffic Control.” The policy was established for use as a guide in determining where school crossings should be located and what other traffic control devices may be appropriate for a given school zone or crossing. At the time of this publication, no education programs relating to bicycles and pedestrians were identified in the Billings Community.

4.9 REFERENCES

1. *Billings Urban Area 2000 Transportation Plan*. TranSystems Corporation. August 1999.
2. *Billings, Montana Helmet Law*. Bicycle Helmet Safety Institute.
<http://www.bhsi.org/billings.htm>



3. *Bicycle Legal Briefs*. Montana Department of Transportation.
<http://www.mdt.state.mt.us/planning/ctep/bikelegal.html>
4. City of Billings Metropolitan Transit (MET). <http://ci.billings.mt.us/met>
5. *Montana Code Annotated 2001*. <http://data.opi.state.mt.us/bills/mca>
6. *Montana's Invisible Traffic Victims: A Preliminary Report on Pedestrian and Bicyclist Injuries in the Treasure State*. Williams, John. Montana Livable Places Campaign.
7. National Climatic Data Center. <http://www4.ncdc.noaa.gov>
8. *Newsline*. Rail, Transit & Planning Division, Montana Department of Transportation (MDT). December 2002.
9. Pedestrian and Bicycle Information Center. <http://www.bicyclinginfo.org>
10. *School Zone Traffic Control Policy*. City of Billings.
http://ci.billings.mt.us/pwe/Traffic_Engineering/SchoolZone_City.htm
11. U.S. Census Bureau. 2000. American Fact Finder. <http://factfinder.census.gov>



5.0 EXISTING NON-MOTORIZED SYSTEM

An integral step in updating the plan for a Billings area non-motorized transportation system was to assess the state of the existing system. The previous chapter discussed the characteristics of Billings and the surrounding area with respect to non-motorized activity. This chapter provides a description of the existing non-motorized system facilities in the Billings area.

5.1 EXISTING NON-MOTORIZED FACILITIES

The existing non-motorized transportation network in the Billings area is made up of a combination of formal and informal facilities. *BikeNet*, the City's previous non-motorized plan, proposed a formal network of interconnected trails and bikeways, of which a few have been constructed. The existing facilities are comprised of paved trails, soft surface trails, on-street bikeways, and sidewalks.

EXISTING TRAILS

Currently, there are just over 10 miles of hard-surface multi-use trails within the greater Billings area. Roughly 6 miles of the paved multi-use trails are continuous, creating an off-street corridor from the Billings Heights to the Yellowstone River near Coulson Park. The remaining multi-use trails consist of independent segments, which have been built in conjunction with other developments. Additionally, several soft surface trails are located along the Yellowstone River, the Rimrocks, and Alkali Creek. Existing improved trails are listed in Table 5.1.1.

ON-STREET BIKEWAYS

In addition to off-street trails, on-street bikeways, wide curb lanes, and paved shoulders are facilities that also provide a means for cyclists to navigate the City. Currently, there are approximately 3.0 miles of striped on-street bikeways. While the number of designated bike lanes are limited, wide curb lanes and paved shoulders also provide informal bike lanes throughout the city.

An inventory of streets identified as potential primary bicycle routes was completed during the summer of 2003. The results indicate that the majority of streets within the urbanized areas of the City had curb lanes in excess of 12-ft. While the streets are not striped with a designated bike lane, the existing widths could easily accommodate both non-motorized and motorized traffic.

Paved shoulders on roadways without curb and gutter can also provide a space on the roadway for non-motorized vehicles. However, outside of the older, urbanized areas of the City of Billings, most of the roads are built according to county standards. The average lane width is less than 12-ft and there is little to no paved shoulder. Existing on-street bikeways are listed in Table 5.1.2.



Table 5.1.1. Existing Trails

IMPROVED TRAILS	Length (mi)	Year Built	Project Cost	Primary Funding
Hard-Surface Multi-Use Trails				
Heights-Kiwanis Trail	2	1996	\$170,000	CTEP
MetraPark Trail	2	1998	\$1,111,440	CTEP
Coulson Park Trail	2	2002		
Circle 50 Trail	0.2	2002	\$40,500	Private
Descro Park Trail	0.5	2003		LWCF
Famous Dave's Trail	0.1	2003	\$15,000	Private
Swords Park Trail	3	2004	\$864,000	CTEP/Local
Midland Park Trail	0.4	2003	\$300,000	Private
Rehberg Ranch Trail	0.75	2003		Private
Soft-Surface Trails				
Jim Dutcher Trail (Riverfront Park)	2			YRPA
Two Moon Park	5			YRPA
YRPA Conservation Pond Trails	2			YRPA
TOTAL IMPROVED TRAILS	10.95		\$2,500,940	

Note: Soft-Surface Trail lengths are approximate lengths.

Table 5.1.2. Existing On-street Bikeways

ON-STREET BIKEWAYS	Length (mi)	Year Built	Primary Funding
Rimrock Road - Virginia Ln. to 17th St. W.	1.5		MDT
38th Street West - Grand to Colton	0.5	2002	Private
S. 25th St. - Minnesota to 7th Ave. S.	0.5	2002	CTEP
Senators Blvd.	0.5	1997	City
TOTAL ON-STREET BIKEWAYS	3.0		

SIDEWALKS

Pedestrian traffic throughout the Billings area is accommodated on traditional sidewalks that exist on one or both sides of most City streets. The sidewalk network provides relatively continuous walking routes in the older and more densely urbanized portions of the City. However, significant discontinuities do exist primarily in outlying suburban areas near the City's edge.



5.2 EVALUATING EXISTING ROADWAYS FOR NON-MOTORIZED IMPROVEMENTS

The first step in identifying roadways for development or improvement of on-street bikeways is to evaluate the existing conditions. More specifically, the purpose of this section is to determine which streets would best accommodate bicyclists. This task was achieved using the newly developed Bicycle Compatibility Index.

BICYCLE COMPATIBILITY INDEX

The Bicycle Compatibility Index (BCI) is an empirically derived model recently developed at the Federal Highway Administration's Turner-Fairbanks Highway Research Center. The goal of the BCI model is to give traffic engineers, transportation planners, and bicycle coordinators a means to evaluate how well a roadway can accommodate efficient operation of both bicycles and motor vehicles. The BCI could be an effective tool for evaluating existing roadways and ranking the need for bicycle-related improvements. Also, minimum BCI criteria could be established to help guide the design of new roadways.

DEVELOPMENT OF THE BCI MODEL

The BCI model was developed by having bicyclists view numerous roadway segments on videotape and rate how comfortable they would be riding on the street under the existing conditions. This surveying methodology allowed the participants to be able to rank the same stretch of roadway under the same traffic conditions without having to be exposed to dangerous riding conditions. Over 200 participants ranked 80 different roadway segments using a scale from *one* to *six*. A *one* indicated that the individual would be "extremely comfortable" riding in the shown conditions, while a *six* indicated that the individual would be "extremely uncomfortable" riding in the shown conditions.

Based on the results, a model was established using linear regression to predict a cyclist's comfort level on any stretch of roadway from the following eight geometric and operational characteristics:

- Presence of a bicycle lane
- Bicycle lane width
- Curb lane width
- Type of development along the roadside (residential or other)
- Curb lane traffic volumes during the peak hour conditions
- Motor vehicle speed
- Presence of on-street parking
- Adjustment factor which accounts for the following three operational conditions:
 1. Percent of heavy vehicles on the roadway,
 2. Number of vehicles turning right into driveways
 3. Number of vehicles pulling into or out of on-street parking spaces



The model was determined to accurately predict the numerical ranking of each roadway segment for urban and suburban roadways. The BCI is applicable to through-corridors or mid-block locations that are exclusive of major intersections. The BCI equation and variable definitions are included in Table 5.2.1.

Table 5.2.1. Bicycle Compatibility Index (BCI) Model

$\text{BCI} = 3.67 - 0.966\text{BL} - 0.125\text{BLW} - 0.152\text{CLW} + 0.002\text{CLV} + 0.0004\text{OLV} + 0.035\text{SPD} + 0.506\text{PKG} - 0.264\text{AREA} + \text{AF}$			
Where:			
BL =	presence of a bicycle lane or paved shoulder ≥ 3.0 ft <i>no = 0</i> <i>yes = 1</i>	PKG =	presence of a parking lane with more than 30% occupancy <i>no = 0</i> <i>yes = 1</i>
BLW =	bicycle lane (or paved shoulder) width <i>ft (to the nearest tenth)</i>	AREA =	type of roadside development <i>residential = 1</i> <i>other = 0</i>
CLW =	curb lane width <i>ft (to the nearest tenth)</i>	AF =	$f_t + f_p + f_{rt}$
CLV =	curb lane volume <i>vph in one direction</i>	where:	
OLV =	other lane(s) volume – same direction <i>vph</i>	f_t =	adjustment factor for truck volumes <i>(see below)</i>
SPD =	85 th percentile speed of traffic <i>mph</i>	f_p =	adjustment factor for parking turnover <i>(see below)</i>
		f_{rt} =	adjustment factor for right-turn volumes <i>(see below)</i>
Adjustment Factors			
Hourly Curb Lane Large Truck Volume ¹	f_t	Parking Time Limit (min)	f_p
≥ 120	0.5	≤ 15	0.6
60 – 119	0.4	16 – 30	0.5
30 – 59	0.3	31 – 60	0.4
20 – 29	0.2	61 – 120	0.3
10 – 19	0.1	121 – 240	0.2
< 10	0.0	241 – 480	0.1
		> 480	0.0
Hourly Right-Turn Volume ²	f_{rt}		
≥ 270	0.1		
< 270	0.0		

¹ Large trucks are defined as all vehicles with six or more tires.

² Includes total number of right turns into driveways or minor intersections along roadway segment.

Source: FHWA Bicycle Compatibility Index: A Level of Service Concept, Implementation Manual

BICYCLING LEVEL OF SERVICE

The *Highway Capacity Manual (HCM)* defines level-of-service (LOS) as “a qualitative measure that characterizes operational conditions within a traffic stream and the perception of these conditions by motorists and passengers.” While the *HCM* does not define LOS in terms of bicyclists, the concept of basing the LOS on the user’s perceptions of the operational conditions applies just as well to bicyclists as it does to motorists. The BCI reflects the comfort levels of bicyclists based on observed geometric and operational conditions and creates a numerical output.

In order to remain consistent to the *HCM*, six LOS designations from A to F were defined. Each letter designation corresponds to a range of numerical values. Based on the responses of all types of cyclists, the roadway segment with the best rating had a mean value of 1.24 and the roadway segment with the worst rating had a mean value of 5.49. Those two extreme values were considered to indicate the conditions in which *all* cyclists would feel comfortable riding in or all cyclists would feel uncomfortable riding in, respectively. The upper and lower boundaries for the LOS designations were established around the two extreme values. Table 5.2.2 gives the numerical equivalents for each LOS designation.

Table 5.2.2. BCI & LOS Designations

LOS	BCI Range	Compatibility Level
A	≤ 1.50	Extremely High
B	1.51 – 2.30	Very High
C	2.31 – 3.40	Moderately High
D	3.41 – 4.40	Moderately Low
E	4.41 – 5.30	Very Low
F	> 5.30	Extremely Low

Source: FHWA Bicycle Compatibility Index: A Level of Service Concept, Implementation Manual

EVALUATING EXISTING ROADWAYS USING THE BCI

The BCI model can be used to evaluate existing roadways, provide design standards for future roadways, and aid in planning how future projects could fit within the existing network of bicycle and pedestrian paths.

All roadway segments identified as primary bicycle routes in the *Heritage Trail Plan* were inventoried to determine the BCI LOS of each segment. A field investigation was conducted to determine the roadway geometry, lane widths, presence of bicycle lanes, presence and occupancy of parking lanes, and posted speed limits. Average Annual Daily Traffic (AADT) volumes were obtained from the City of Billings counts (2001–2003), the Billings Traffic Model being prepared by the Montana Department of Transportation (MDT), and counts

taken by Engineering, Inc. (2000-present). A summary of the data collected and used for the determination of BCI LOS is included in Appendix C.

In cases where the data was not available, adjustments and assumptions were made in accordance with the *Bicycle Compatibility Index: A Level of Service Concept, Implementation Manual* (FHWA-RD-98-095). For example, 85th percentile speeds were assumed to be 9 mph above the posted speed limit. Also, the percentage of heavy vehicles was assumed to be 3.5% for principal arterials, 2% for minor arterials, 1.5% for collectors, and 0% for local streets.

A summary of the BCI calculations and results for each of the primary bicycle routes outlined in the *Heritage Trail Plan* is included in Appendix D. As with motor vehicle facilities, it is recommended that all primary bicycle routes operate at LOS C or higher. Bicyclists can use the results of this BCI analysis to determine the safest and most comfortable routes. In addition, these results were used as one of the criteria in prioritizing on-street improvements (see Chapter 7).

5.3 SPECIAL FEATURES

Currently there are few special features or amenities associated with the non-motorized trails and on-street bikeways. The only existing special features include two bikeway/roadway crossings.

SHILOH PEDESTRIAN UNDERPASS

The Shiloh Pedestrian Underpass is a grade-separated crossing located on Shiloh Road between Grand Avenue and Rimrock Road. Shiloh Road carries an AADT volume of approximately 9,000 vpd near the crossing and the underpass was designed to offer a safe crossing location for pedestrians and bicyclists. The crossing connects a multi-use trail stub on the west side of Shiloh Road to the Circle 50 multi-use trail on the east side of Shiloh Road. The total cost for construction of this project was approximately \$600,000.



Photo by Imagimark! Productions

CENTRAL AVENUE BIKE CROSSING

The Central Avenue bicycle crossing is an at-grade mid-block crossing located on Central Avenue between the BBWA Canal and 29th Street West. The bicycle crossing consists of raised center islands with an at-grade cutout that directs cyclists to turn and face on-coming traffic mid-street before crossing the other half of the roadway. The crossing connects the south end of the Descro Park trail to the north side of Stewart Park. The engineer's estimate of probable cost for this project was approximately \$50,000.



Photo by Engineering, Inc.

5.4 CORRIDORS, RIGHTS-OF-WAY, AND EASEMENTS

In addition to existing non-motorized facilities that have been built within the City of Billings, there have also been several corridors identified for future development of off-street bike and pedestrian facilities. Most of the corridors are comprised of a series of dedicated rights-of-way and easements within the newer subdivisions on the fringe of the densely populated urban area. Most easements or rights-of-way are acquired from developers and landowners that voluntarily dedicate land for trails or utilities. Therefore, as some landowners and developers have chosen not to dedicate land towards a trail system, there are discontinuities along potential corridors. The major corridors that have been identified for future development include waterway drainages and old railroad rights-of-way.

WATERWAY CORRIDORS

Existing waterway drainages provide excellent scenic opportunities for trail development. It should be noted that, because of the risk of flooding, certain issues would need to be addressed during the design process. The following major waterways were identified as potential trail corridors:

- Yellowstone River
- Alkali Creek
- Blue Creek
- Clear Creek
- Five Mile Creek
- Canyon Creek
- Hogan's Slough
- The Big Ditch
- BBWA Canal



- Bitter Creek
- Cove Ditch
- 100 Foot Lift Canal

Other drainage areas, even minor ones, should be considered as potential trail corridors.

RAILROAD CORRIDORS

Existing and abandoned railroad rights-of-way also provide a great opportunity for trail corridors. For example, the Heights-Kiwanis multi-use trail was constructed within the old BNR railway spur right-of-way. All railroad corridors within the City of Billings and Yellowstone County provide potential opportunities for trail development.

SUBDIVISION EASEMENTS AND RIGHTS-OF-WAY

A summary of subdivisions with known recorded easements or rights-of-way is shown in Table 5.4.1.

Table 5.4.1 Subdivision Easements and Rights-of-Way

Subdivision Name & Filing	Easement	R/W	Description
Bell Estates Sub., 3rd Filing	x		Adjacent to Shiloh Drain easement
Billings Heights St. V's Medical & Health	x		15-ft easement adjacent to BBWA
Bitterroot Heights Sub.			Easement requested along Five Mile Creek
Brey Sub.	x		Easement along Cove Ditch and through Tr. 1, between Lots 4 and 5
Cherry Creek Estates Sub.	x		20-ft wide Bike-Net easement along Yellowstone River
Chrysalis Acres Sub.	x		15-ft easement along north boundary of subdivision
Clear Creek Sub.	x		50-ft wide conservation easement along Clear Creek Drainage
Crooked Creek Sub.	x		20-ft wide drainage ditch easement along Five Mile Creek
Deep Powder Sub.	x		10-ft wide pedestrian walkway connecting Deep Powder Drive and Clubhouse Way
Dry Creek Sub.	x		20-ft wide easement along Hwy 87 for bike trail
Emmanuel Baptist Annex			West side of Shiloh Drain
Famous Dave's Sub.			Constructed 10 ft. wide trail adjacent to BBWA
Five Mile Creek Sub.	x		100-ft wide easement along Five Mile Creek
Forest Park Sub., 6th Filing	x	x	20-ft wide easement located along the west and south subdivision boundaries 25-ft public utility right-of-way
Ironwood Sub.	x		10-ft wide easement along Ironwood Drive 30-ft wide Conoco Pipeline easement adjacent to Block 1, Lots 74-75, Block 12, Lots 25-27, Block 10, Lot 19



Table 5.4.1 Subdivision Easements and Rights-of-Way (continued)

Subdivision Name & Filing	Easement	R/W	Description
j&e Sub.	x	x	20-ft wide Carol Drain easement Linear park connecting Carol Drain easement to City utility right-of-way (old spur line)
Kreitz Heights Sub.	x		15-ft easement on east side along BBWA; sunset of easement after 3 yrs. if no trail built.
Linlee Lake Estates Sub.			Parkland north of Danford Drain
Menholt Sub.	x	x	10-ft wide BikeNet/utility easement Banister Drain Right-of-Way across the BBWA canal
Midland Sub.			8 ft wide trail built along north boundary
Montana Sapphire Sub.	x		114-ft wide Shiloh Drain easement
Morningside Sub.	x		Annexation agreement for trail easement through Unit 14, Tr. 2
Pierce Sub.	x		Easement to construct trail along Zoo Dr when lots develop
Rehberg Ranch Estates Sub.	x		Multiple 20-ft wide drainage easements allowing access from local roadways into park land
Rimrock West Estates Sub., 5th Filing	x		20-ft. wide easement along south edge
Riverview Estates Sub.	x		20-ft wide easement along Yellowstone River
Rush Sub., 6th Filing	x		15-ft wide ditch easement and 25-ft wide linear park located along the north side of the Big Ditch
Rush Sub., 7th Filing	x		15-ft wide ditch easement
Schuyler Sub., Amnd Lot 2, Block 1	x		110-ft Arnold Drain easement
Shiloh Business Park Sub.	x		16-ft wide utility and sidewalk easement along Zoo Drive, Shiloh Road, and Pierce Parkway
Sierra Estates Sub., 2nd Filing	x		35-ft easement for 100-ft Lift Canal along north side of Block 1, Lots 1-6 and 10-ft walkways connecting La Paz Ct. and Durango Place and Guadeloupe Drive to the park
South Heights Sub.	x		10-ft wide trail access easement connecting South Heights Lane to the City right-of-way (Kiwanis Trail)
Tanglewood Sub.			Suggested connection to trail along Cove Ditch
Terra West Sub., 4th Filing	x		20-ft wide irrigation ditch easement



Table 5.4.1 Subdivision Easements and Rights-of-Way (continued)

Subdivision Name & Filing	Easement	R/W	Description
Terrace Estates, 3rd Filing			Parkway along the Alkali Creek Drainage
Transtech Center Sub.			Constructing 10-ft wide trail throughout subdivision
Uinta Park Sub.			20-ft wide linear park along the BBWA Canal tract
The Village Sub.	x		Trail easements throughout subdivision with connections along Shiloh Road
Westlind Sub.			Along Canal to connection to parkland
Whitney Meadows Sub.	x		20-ft wide along BBWA
Wildwood Sub.			Parkland dedication along west boundary
Wolf Meadows Sub.	x		Easement along BBWA
Yellowstone Club Estates Sub.			Lot 1 along lower portion of Rims and Lot 2 along top of Rims
Yellowstone Ridge Sub.	x		Parkland easement along north side of subdivision and north-south easement connection for trail

5.5 REFERENCES

1. *Bicycle Compatibility Index: A Level of Service Concept, Implementation Manual*. Federal Highway Administration. Publication No. FHWA-RD-98-095.
2. *Highway Capacity Manual (HCM2000)*. Transportation Research Board. National Research Council. Washington, D.C. 2000.