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Battle Creek Bike Club Circa 1895  
Willard Library Website

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Non-motorized transportation includes walking, bicycling, small-wheeled transport (skates, skateboards, push scooters and hand carts) and wheelchair travel. These modes provide both recreation (they are an end in themselves) and transportation (they provide access to goods and activities), although users may consider a particular trip to serve both objectives.

Source: Victoria Transportation Policy Institute.



### PURPOSE OF THE MASTER PLAN

The purpose of this project is to develop a 20-year non-motorized vision for both on and off-road non-motorized facilities that will provide a convenient and safe option to link people, schools, businesses, parks, natural resources, and cultural and historic landmarks to each other as well as to adjacent communities and resources.

### GOALS FOR THE MASTER PLAN

- Be implementation oriented and serve as a guide for non-motorized trail, bike lane, and route signage planning, funding, design, and construction.
- Communicate in a highly illustrative manner, the vision, goals, and possibilities for non-motorized connections.
- Communicate the various benefits of a connected non-motorized system.
- Utilize community and stakeholder involvement and input to develop the non-motorized vision.
- Utilize the plan to establish Battle Creek as a non-motorized friendly community.

The City of Battle Creek developed this Master Plan for both on and off-road, non-motorized facilities that will link people, schools, businesses, parks, natural resources, and cultural and historic landmarks to each other as well as to adjacent communities and resources. This Master Plan examines potential expansions of the Linear Park system (off-road trails) as well as the potential for on-road bike lanes within the community. The City is committed to developing a connected non-motorized system due to their many benefits including: health, recreation, quality of life, alternative transportation, pollution reduction, conservation of natural resources, and increased tourism and property values.

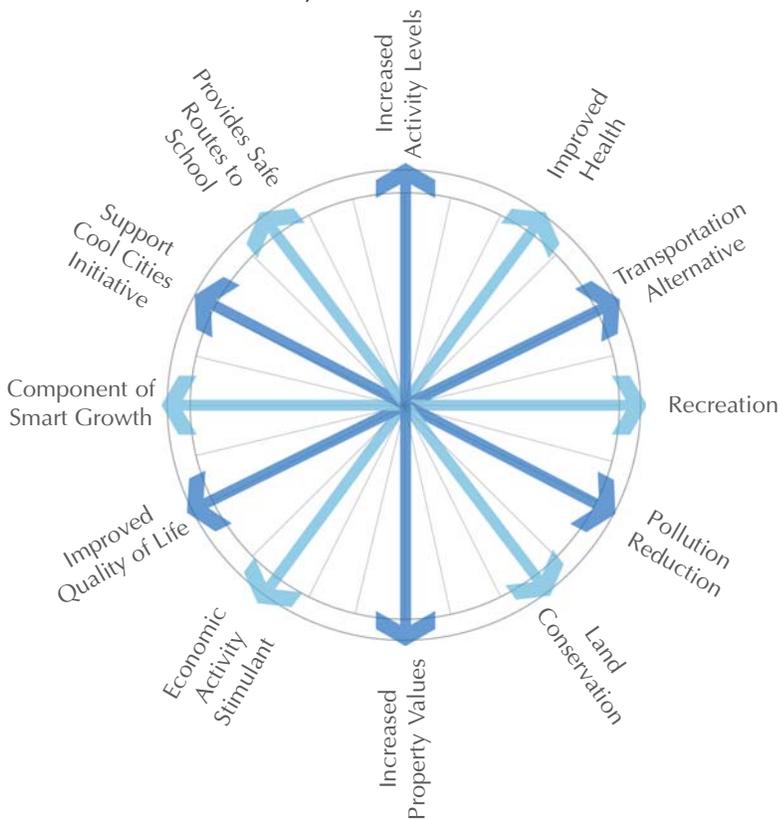
This plan is intended to serve as a guide to non-motorized trail and bike lane planning, funding, design and construction into the future. The Master Plan will also serve as a document that can communicate the coordinated goals and direction of non-motorized transportation in Battle Creek. The City has worked hard over the years to develop the Linear Park system that is used and enjoyed by many people. This Master Plan utilizes the Linear Park system as a foundation to expand and build upon.

This Master Plan documents the benefits of non-motorized transportation; the existing system within Battle Creek including primary destinations within the community such as schools, parks, cultural icons, and the downtown district; maps and graphics illustrating the planned locations for off-road trails and on-road bike lanes; design considerations and typical cross-sections for various conditions found within the City; short-term priority segments/projects; and, an implementation strategy including estimates of probable costs and potential funding strategies.

## BENEFITS OF NON-MOTORIZED SYSTEMS

Non-motorized systems are a tremendous community asset, providing a host of benefits. Non-motorized systems can lessen the traffic burden by providing alternative routes to school, work, shopping, etc. By reducing traffic congestion, these systems can also lessen the environmental costs associated with automobiles. At the same time, non-motorized systems promote healthier communities and increased recreational opportunities. By attracting visitors and increasing property values, non-motorized systems can also bolster local and regional economies. Taken together, these benefits can strengthen individual and community well being, while fostering greater economic and environmental sustainability. The following sections examine these benefits in greater detail.

### Benefits of Non-Motorized Systems



### TRANSPORTATION ALTERNATIVE

In today's automobile-dominated landscape, walking or bicycling as a mode of transportation can be difficult and often dangerous. Absent bicycle lanes, trails, or sidewalks, would-be users of non-motorized transportation are often discouraged. As a result, short trips that could easily be made by bicycle or foot are often made by car. In Michigan, 57% of all trips under a half mile are made by car. In contrast, only 2.2% of Michigan commutes are done on foot<sup>1</sup>. These figures suggest that Michigan truly is an automobile dominated state.

At the same time, many people are growing tired of the costs, dangers, and frustration that accompany private automobile commuting. In a recent national survey, 55% of Americans said they would prefer to walk than drive, and 66% said they supported innovative solutions, such as walking or taking the bus, to reducing traffic congestion<sup>2</sup>. As support grows for alternative ways to get around, more communities are looking to non-motorized systems for answers. These efforts are reducing automobile-dependency, while making walking and biking safer, more enjoyable, transportation options.

### RECREATION

The 2000 Census reveals that almost 75% of Michigan residents live in urban areas<sup>3</sup>. As urban areas expand, large open areas for recreation are often lost to development. At the same time, increasing urban populations create a growing demand for these open spaces. Michigan is unique in its abundance of parkland. However, access to many of these parks requires an automobile. Non-motorized systems can improve recreation opportunities by linking urban areas with local and regional parks, as demonstrated by the Battle Creek Linear Park. Trails and pathways accommodate a host of recreational interests, such as walkers, runners, in-line skaters, cross-country skiers, and the physically challenged. By providing access to lakes, rivers, and woodlands, non-motorized systems foster passive recreation such as fishing, bird watching, and outdoor education. By linking communities and natural areas, non-motorized systems are making Michigan communities more enjoyable places, and improving quality of life.

### ENVIRONMENT AND CONSERVATION

Non-motorized systems complement ongoing efforts to reduce pollution and conserve important natural features. By reducing the volume of automobile traffic, non-motorized systems can improve air and water quality. Greenway linkages can also help protect sensitive ecological systems from ever-expanding urban development. Investment in Michigan's non-motorized network is an investment in the health and integrity of the State's most important natural resources.

Automobiles are the largest source of air pollution in the US, emitting carbon monoxide, ozone, particulate matter, sulphur oxides, and hydrocarbons. These airborne pollutants contribute to a number of human health problems. Falling back to the land in the form of rain or dust, these pollutants also degrade soil and water quality. A reduction in short vehicle trips can have significant impacts on environmental health. For example, a four-mile bicycle ride, in place of driving, can prevent 15

<sup>1</sup> Surface Transportation Policy Project  
[http://www.transact.org/library/reports\\_pdfs/pedpoll/MI.pdf](http://www.transact.org/library/reports_pdfs/pedpoll/MI.pdf)

<sup>2</sup> Ibid

<sup>3</sup> American Fact Finder. 2000 Census. Detailed Tables SF1  
<http://factfinder.census.gov>

pounds of pollutants from being released into the air<sup>4</sup>. As several counties in Southwest Michigan, including Calhoun County, are designated non-attainment zones by the US EPA, non-motorized systems are increasingly viewed as a promising approach for reducing air pollution.

A non-attainment area is one that does not meet (or is contributing to another area's inability to meet) the Environmental Protection Agency's standards for ground-level ozone pollution. The current federal standards do not allow areas to exceed .08 parts per million of ozone over an eight-hour period. Compliance is based on the fourth highest reading per year averaged over three years.

Aside from pollution reduction, trails and greenways help to sustain the ecological integrity of Michigan's natural systems. As linear vegetated corridors, trails and greenways play an important role in linking natural areas, fostering plant growth, and ensuring wildlife access to water and food. Greenways can also protect water quality by isolating aquatic ecosystems from developed land areas. As buffers, greenways can absorb storm water runoff, capturing non-point sources of pollution before they enter surface waters. Greenways can also ensure the protection of pervious land areas, which are essential to the health and abundance of Michigan's groundwater resources.

#### HUMAN HEALTH

The recreation and transportation opportunities created by non-motorized systems invariably contribute to improved human health and well-being. The sedentary lifestyle of many Americans is causing a multitude of preventable health problems in people of all ages. These problems are partly the result of community design. By creating non-motorized systems, communities can remove structural and motivational barriers to more active lifestyles, increase social interaction, and enhance physical and mental well-being.

Physical inactivity is a serious problem in Michigan, contributing to obesity and a host of preventable diseases and deaths. Currently, twenty-five percent of Michigan adults are obese.<sup>5</sup> Similarly, nearly eleven percent of Michigan children are considered overweight (the term "obese" is not usually used for kids), a threefold increase in 30 years.<sup>6</sup> Physical inactivity increases the risk of cardiovascular disease, type 2 diabetes, hypertension, stroke, gallbladder disease, osteoarthritis, sleep apnea, respiratory problems, psychological disorders, stress, and cancers.<sup>7</sup> In addition to being dangerous, inactive lifestyles are

#### **Health Benefits of Regular Physical Activity**

- Reduces the risk for dying prematurely
- Reduces the risk for dying from heart disease
- Reduces the risk for developing diabetes
- Reduces the risk for developing high blood pressure
- Helps reduce high blood pressure
- Reduces the risk for developing colon cancer
- Reduces feelings of depression and anxiety
- Helps control weight
- Helps build and maintain healthy bones and muscles
- Helps older adults become stronger and better able to move about without falling
- Promotes psychological well-being

Source:

<http://www.cdc.gov/healthylives/healthtopics/physactivity.htm>

also costly. In 2002, physical inactivity cost Michigan adults \$8.9 billion for health care<sup>8</sup>.

In response, the Michigan Surgeon General's office has launched a statewide campaign to promote healthy and active living in Michigan. The program, "Michigan Steps Up," identifies five steps to improving human health. Central to this initiative is making physical activity safer and easier in Michigan communities. The Surgeon General recommends the connection of "neighborhoods, schools, stores and parks with trails and sidewalks," as well as "adding bike lanes and proper signage to key roads."<sup>9</sup> The presence of these facilities can remove barriers to exercise by providing immediate access to destination-based corridors that are safe and enjoyable. Increased physical activity, such as walking, bicycling, or rolling, can reduce the risk of several health problems. The presence of these facilities can also serve as rallying points for community clubs and social interaction. Examples can include running and bicycling groups, walk-to-work days, and charity races. These events, in turn, reinforce the culture and acceptability of active community lifestyles.

#### **The Surgeon General Recommends...**

The Michigan Surgeon General recommends 60 - 90 minutes of moderate intensity\* physical activity at least five days a week. For those with busy schedules, this can be broken up into 10- or 15-minute periods throughout the day. Duration and intensity of exercise will vary depending on person.

\*Moderate intensity is when you feel exertion during physical activity but you are able to carry on a conversation comfortably.

<sup>4</sup> Pedestrian and Bicycling Information Center. "The Benefits of Bicycling" <http://www.bicyclinginfo.org/pp/benefits/enviroben/index.htm>

<sup>5</sup> The Detroit News. <http://www.detroitnews.com/2004/health/0402/26/health-75744.htm>

<sup>6</sup> Ibid

<sup>7</sup> Informing the Debate: Health Policy Options for Michigan Policy Makers. Study Conducted by Grace Kreulen Ph.D., R.N. 2002. <http://ippsr.msu.edu/Publications/Weight.pdf>

<sup>8</sup> The Economic Cost of Physical Inactivity in Michigan, Michigan Fitness Foundation, Study Conducted by David Chenoweth, Ph.D. FAWHP, 2003.

<sup>9</sup> <http://www.michigan.gov/surgeongeneral>

In addition to preventative or measurable health benefits, non-motorized systems can provide a number of less tangible benefits, such as improved mental outlook, and enhanced well being. For example, walking, bicycling, or rolling, can provide an increased sense of self reliance, improve social relationships, and foster a greater sense of independence and freedom.<sup>10</sup> Finally, the presence of a non-motorized system can help to spread community awareness about the importance of regular exercise and general health awareness.

Also, historically, Battle Creek was developed, in part, by the concept of healthy living and was known as “Health City” for some time. This legacy of healthy living and healthy lifestyles is an important part of the fabric of the community.

### ECONOMIC DEVELOPMENT

As several Michigan communities work to bolster their local and regional economies, many are looking to non-motorized systems to complement these efforts. This is because non-motorized systems have proven successful at increasing property values, boosting retail sales, attracting tourism, as well as lowering health costs. There is a clear connection between non-motorized access and improved economic vitality. The following sections outline a few such instances.

#### Property Values

The access provided by non-motorized systems is widely regarded as an attractive component of a community. Such systems can provide places for children to recreate, access to natural features, and reduce automobile reliance. These characteristics are often sought by potential homebuyers, and are often touted as key selling points by real estate agents. In a study of recent homebuyers, trails ranked second among the 18 most desired community amenities.<sup>11</sup> Similarly, Brown County, Wisconsin found that properties adjacent to the Mountain Bay trail sold faster, and for about nine percent more than similar properties not adjacent to the trail.<sup>12</sup> Finally, following development of the Betsie Valley Trail in Benzie County, Michigan, property values adjacent to the trail rose between six and ten percent.<sup>13</sup> Non-motorized systems provide a unique amenity that can enhance the character and economic vitality of nearby properties.

#### Local and Regional Economies

Attracting visitors and stimulating economic activity are central to Michigan’s economic development objectives. Local and regional non-motorized systems can increase the circulation of people and money within and between communities. Trails that

link regional communities can transform ordinary communities into destinations. Coupled with unique natural features such as lakes, rivers, and parks, these destinations become even more desirable for prospective visitors. Local communities, in turn, benefit by providing equipment, refreshments, and lodging to trail users. Several success stories are emerging in states across the country.

- In Lanesboro, Minnesota, the Root River Trail has stimulated a substantial amount of economic activity. Before the trail was developed, Lanesboro was a sleepy town of 800. Today, with the trail in place, Lanesboro boasts 12 B&Bs (with year-long wait lists), eight restaurants, an art gallery, a museum, and an extremely successful theater.<sup>14</sup>
- The Ohio, Kentucky, Indiana Regional Council of Governments reports that each year 150,000 to 175,000 people visit the 27 mile stretch of trail that runs between Loveland and Corwin in Warren County, Ohio. These visitors spend approximately \$3.1 to \$3.7 million annually on trip-related expenditures and trail-related accessories.<sup>15</sup>
- An American Hiking Society study reveals similar benefits along the Missouri River State Trail. According to the study, after just one season, 61 businesses located along the 35-mile-long trail reported benefiting from the trail’s creation. Eleven of the businesses reported that the Trail had strongly influenced their decision to establish their business, and 17 (28%) had increased the size of their investment since the Trail had opened.<sup>16</sup>
- An economic impact study of the Pere Marquette Trail in Central Michigan, found that more than 60% of trail users visited a business along the trail. The trail is also attractive to the local workforce. The same study revealed that among businesses located within ¼ mile of the trail, 96% of their employees use the trail<sup>17</sup>.

### MICHIGAN’S COOL CITIES INITIATIVE

The Cool Cities Initiative is an economic development strategy designed to make Michigan communities more attractive to innovative businesses and young professionals. The Initiative was launched by Governor Jennifer Granholm in 2003 as an effort to keep pace with a changing economy, retain recent college graduates, and counter the dispersive pattern of development that has resulted in the economic decline of many central cities.

The Cool Cities Initiative developed a survey to identify what makes a community an attractive place to live and work. By

<sup>10</sup> USDOT. The National Walking and Bicycling Study: Transportation Choices for a Changing America. Federal Highway Administration. 1994.

<sup>11</sup> Consumer’s Survey on Smart Choices for Home Buyers, National Association of Realtors and National Association of Home Builders, April 2002.

<sup>12</sup> Recreation Trails, Crime, and Property Value: Brown County’s Mountain-Bay Trail and the Proposed Fox River Trail, Brown County Planning Commission, Green Bay, July 6, 1998.

<sup>13</sup> The New Path to Prosperity: Betsie Valley Trail Revving Up Small Town Economies. By Kelly Thayer. <http://www.mlui.org/transportation/fullarticle.asp?fileid=16872>

<sup>14</sup> American Trails. “The Economic Impacts of Trails.” By Gary Sjoquist. <http://www.americantrails.org/resources/economics/MNNecon.html>

<sup>15</sup> Ohio, Indiana, Kentucky, Regional Council of Governments. <http://www.oki.org/transportation/bike/littlemiami.html>

<sup>16</sup> American Hiking Society. “The Economic Benefits of Trails.” <http://www.americantrails.org/pdf/econAHS.pdf>

<sup>17</sup> A case study measuring economic and community benefits of Michigan’s Pere Marquette Rail-Trail, Michigan State University. Research conducted by Christine Vogt, Ph.D. Charles Nelson, Ph.D. and Joel Lynch, Ph.D.

**Cool Cities Core Values**

Different Lifestyles  
Diversity  
Art/Culture  
Gathering Places  
4-Seasons  
Music Scene  
Walkable Streets  
Historic Architectural Character  
Many Different Jobs  
Service Businesses

April 2004, 13,500 people had completed the survey. Among those surveyed, 86% identified walkability as a key attribute to a livable community. Survey analysts identified six major factors for communities to consider in future development efforts. Proximity to

outdoor recreation facilities, such as lakes, beaches, forests, and trail systems ranked second among these factors. The number one factor was implementation of the Cool Cities “Core Values.”<sup>18</sup>

In addition to being a participant in the Cool Cities Initiative, Battle Creek, in 2003 was invited by Governor Granholm to be part of a Michigan Cool Cities Statewide Advisory Group. With the development of a non-motorized system, Battle Creek will not only become a Cooler City, it will serve as a model of innovative planning practice for communities around Michigan to follow. Battle Creek was designated by the Governor as a “Cool City” in June 2005 and received a \$100,000 grant for a downtown condo project.

**SMART GROWTH**

Emerging as an alternative to traditional, automobile-oriented development practices, principles of Smart Growth are being adopted in communities throughout the Nation. With expanding urban and suburban populations, communities are experiencing the economic, environmental, and societal costs of disbursed development patterns, sometimes referred to as “urban sprawl.”

**Smart Growth Principles**

- Mix Land Uses
- Take Advantage of Compact Building Design
- Create a Range of Housing Opportunities and Choices
- Create Walkable Neighborhoods
- Foster Distinctive, Attractive Communities with a Strong Sense of Place
- Preserve Open Space, Farmland, Natural Beauty, and Critical Environmental Areas
- Strengthen and Direct Development Towards Existing Communities
- Provide a Variety of Transportation Choices
- Make Development Decisions Predictable, Fair, and Cost Effective
- Encourage Community and Stakeholder Collaboration in Development Decisions

Source:  
<http://www.epa.gov/livability/>

While the urban core of many cities is in decline, Smart Growth promotes redevelopment of these areas with the intention of strengthening their economies, protecting human and environmental health, and improving community well-being through urban design. While not opposed to growth, proponents of Smart Growth seek to develop areas that will yield the highest return on investment, while protecting the character of the community and the landscape. Non-motorized systems complement the Principles of Smart Growth by helping to make communities more walkable and bikeable, protecting important natural areas, and reducing automobile-related pollution.

**SAFE ROUTES TO SCHOOL**

The number of children walking or bicycling to school has dropped in recent years. A recent survey of US adults revealed that more than 71 percent walked or biked to school as a child, whereas only 18% of their children walk or bike to school today. The Centers for Disease Control and Prevention reveal similar statistics, noting that today almost 85% of children’s commutes to school are made by car, bus, or some other form of motorized transportation.

Individual efforts to deliver children safely to school are collectively resulting in a number of undesirable physical and social outcomes. A reduction in the number of children walking or bicycling to school means more vehicle trips and more traffic in school zones, adding to the notion that walking and bicycling to school is unsafe because of all the traffic. Another unintended consequence is the increase in automobile-related air pollution around school zones.

Motorized commutes also exacerbate problems associated with children’s increasingly sedentary lifestyles. The decline in the number of children walking to school corresponds to a sharp increase in the incidence of overweight children. The time children spend in vehicle commutes deprives them of valuable opportunities for physical activity, social interaction, and getting to know their surrounding built and natural environment.

As these trends become more apparent, local communities are taking action, resulting in a national movement known as Safe Routes to School. Commonly known as “SR2S”, these initiatives employ a wide variety of strategies to make walking or biking to school safer and easier. SR2S programs typically engage parents, community members, school staff, traffic engineers, city planners, law enforcement officers, and other community leaders.

Working together, with state and/or federal assistance, SR2S coalitions focus on the “five E’s” of a sound program: Educating the community; Encouraging students to walk or bike to school; Enforcing traffic and safety laws; Engineering that accommodates users of non-motorized transportation; and Evaluating programs and making adjustments when needed. Battle Creek’s Westlake Elementary was one of only eleven schools in Michigan chosen as a project in a two-year pilot program.

Michigan launched a state-wide Safe Routes to School initiative in fall 2005. The program is sponsored by the Michigan Governor’s Council on Physical Fitness, and was developed

<sup>18</sup> Michigan Cool Cities Initiative.  
<http://www.coolcities.com/heard/results/>



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with the input of a diverse coalition including state, non-profit, and private stakeholders. With the passage of the federal transportation legislation in 2005, Michigan's SR2S program will make schools eligible for transportation enhancement funds, providing for infrastructure improvements and education campaigns. The purpose of the program as defined in the federal legislation is:

- (1) to enable and encourage children, including those with disabilities, to walk and bicycle to school;
- (2) to make bicycling and walking to school a safer and more appealing transportation alternative, thereby encouraging a healthy and active lifestyle from an early age; and
- (3) to facilitate the planning, development, and implementation of projects and activities that will improve safety and reduce traffic, fuel consumption, and air pollution in the vicinity of schools.

Nation-wide the program authorizes \$612 million over the 5 fiscal years beginning with 2005 (which ended this September 30). The Michigan Department of Transportation estimates that Michigan's total apportionment over the 5 years will be roughly \$19 million.

To assist in local SR2S program development, the State has developed an SR2S toolkit. The toolkit contains information on route assessment, parent and student engagement, hands-on demonstrations, and informational aids such as flyers, invitations, and press releases.





There are many factors that have been considered and contribute to understanding current conditions within and around the City of Battle Creek. Each of these elements plays an important role in developing a long-term non-motorized plan that makes sense, is safe, and can be implemented, whether it be a planned road reconstruction, an emerging cross-county trail, traffic volumes, or an existing mile of off-road trail.

Utilizing the City GIS data, a base map of existing conditions was generated as a foundation for future non-motorized transportation planning. Elements such as lakes, rivers, and roads were mapped in relation to the City boundaries, schools, and parks. Existing conditions information also included an understanding of primary clusters of activity within the community such as downtown Battle Creek, the Fort Custer Recreation Area, Kellogg Community College, and the Lakeview Square Mall Area. Providing connections to these destinations was a guiding principal throughout the development of the overall non-motorized vision.

The following pages include a description of the emerging national, state, and regional non-motorized systems; a description of the primary destinations within and in close proximity to Battle Creek; a description of the existing system within the City; planned projects; related initiatives and efforts that have/will affect the vision for Battle Creek; a review of existing policies and ordinances; as well as other related conditions that affect the location of proposed connections.

## THE EMERGING NETWORK

To fully understand the non-motorized vision within the City of Battle Creek, it is important to understand how the City fits into the bigger picture of an emerging, connected non-motorized system.

### NORTH COUNTRY NATIONAL SCENIC TRAIL

Threading its way across many diverse landscapes, the North Country National Scenic Trail (NST) links outstanding scenic, natural, recreational, historic, and cultural areas in seven of our northern tier states - New York, Pennsylvania, Ohio, Michigan, Wisconsin, Minnesota, and North Dakota. The eastern end of the trail is at New York's Crown Point State Historic Site on the shore of Lake Champlain. The western end is at Lake Sakakawea State Park in west central North Dakota where it joins the route of the Lewis & Clark National Historic Trail. When completed, the North Country Trail will be the longest in the U.S. traversing more than 4,000 miles.



From the grandeur of the Adirondack Mountains in New York, the trail meanders westward through the hardwood forests of Pennsylvania, and across the Ohio and Michigan countryside. Utilizing a stretch of the Battle Creek Linear Park, the trail continues north to the shores of the Great Lakes, traversing glacial-carved forests, lakes, and streams of northern Michigan, Wisconsin, and Minnesota. The trail ends in the vast plains of North Dakota.

Approved by Congress in 1980, the Trail currently consists of 1,700 miles of certified segments. National Scenic Trails are administered by the National Parks Service, and local segments are managed by local authorities. Trail development efforts are ongoing, and enlist the support of all levels of government as well as non-profit organizations, and private businesses.<sup>1</sup>

### MICHIGAN TRAILS AND GREENWAYS ALLIANCE

The Michigan Trails and Greenways Alliance (MTGA) is a non-profit organization that shall foster and facilitate the creation of an interconnected statewide system of trails and greenways for recreation, health, transportation, economic development, and environmental/cultural preservation purposes. MTGA personnel were formally the Rails-to-Trails Conservancy Michigan Field

<sup>1</sup> <http://www.nps.gov/noco/>  
<http://www.northcountrytrail.org/>

Office. A project that the former RTC office was working on is the creation of the Michigan Airline Trail, which includes a 230-mile route connecting Lake St. Clair to Lake Michigan, traversing eight counties in Southern Michigan. Michigan ranks third in the country in open rail-trails with more than 1,300 miles connecting parklands, communities, resorts, historic sites, and greenways.



### MICHIGAN DEPARTMENT OF NATURAL RESOURCES

The Michigan Department of Natural Resources (MDNR) manages millions of acres of state lands, and hundreds of miles of multi-use trails. Partnering with the Michigan Natural Resources Trust Fund, the Michigan Natural Resources Commission, local governments, and community groups, MDNR is working towards creation of a statewide system of public, multi-use trails. MDNR coordinates the Michigan Trailways program, which designates trail segments as official "Michigan Trailways," ensuring their safety and accessibility, while making them eligible for a host of benefits. In 2002, the Natural Resources Commission designated the 34.5 mile Kal-Haven Trail (from South Haven to the northwest suburbs of Kalamazoo) as an official Michigan Trailway. At present, Michigan boasts more than 1,000 miles of trailways that are either completed or under development, 348 miles of which are paved. MDNR has identified an additional 337 miles of preserved corridors with "great trailway potential." More Michigan Trailway candidates are sure to emerge as corridors become available and local trails are linked to the larger network.

### MICHIGAN DEPARTMENT OF TRANSPORTATION SOUTHWEST MICHIGAN NON-MOTORIZED INVESTMENT PLAN

The Michigan Department of Transportation (MDOT), Southwest Region has been working toward developing a Non-Motorized Transportation Investment Plan. This Plan is intended to integrate non-motorized considerations into Southwest Michigan's planning and programming activities. The Plan focuses on the nine counties comprising MDOT's Southwest Regional jurisdiction, including: Allegan, Barry, VanBuren, Kalamazoo, Calhoun, Berrien, Cass, St. Joseph, and Branch Counties. Guided by community input, MDOT developed nine non-motorized facility maps, one for each county in the Southwest Region. These maps identify existing and proposed non-motorized routes for each of the counties involved. MDOT hopes that the Plan will eventually be incorporated by all MDOT regions, and that non-motorized planning decisions will reflect local needs and priorities.





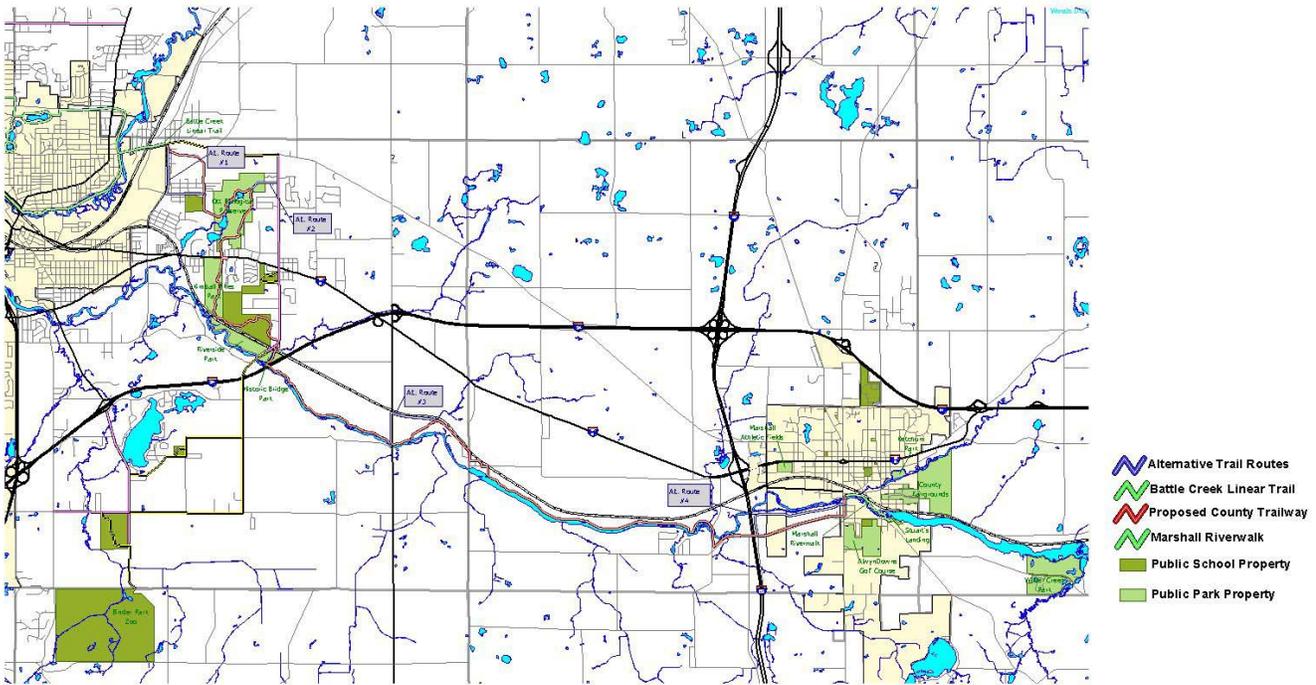
**CALHOUN COUNTY  
NON-MOTORIZED MASTER PLAN**

Calhoun County's Parks and Recreation Department developed a county-wide Non-Motorized Master Plan. The first leg of the system will connect Battle Creek's Linear Park and Marshall's Riverwalk with a trail that generally follows the Kalamazoo River. The route eventually will connect Battle Creek and Homer via Marshall and Albion, with about 30 miles of paved or

achieving them. Of particular relevance are two goals listed under *Facility Improvements*. The goals state:

1. *The primary focus will be on maintaining and improving upon existing parks and facilities while taking advantage of opportunities to acquire, develop, and link the new parks/ green spaces when appropriate.*

**Calhoun County Trailway Master Plan**



compacted-earth trails and boardwalk designed for non-motorized traffic. The County-wide system may also lead to a connection with the Michigan Airline Trail, a system of trails under development that aims to connect Lake St. Clair on Michigan's east coast to Lake Michigan in the west.

**RELATED INITIATIVES AND EFFORTS**

Several significant planning, design and construction efforts exist or are on-going that relate to or have a direct affect on the emerging non-motorized system within the City of Battle Creek.

**CITY OF BATTLE CREEK  
PARKS AND RECREATION MASTER PLAN  
2004-2008**

The Battle Creek Parks and Recreation Master Plan Update enables the City to compete for state and federal grants, and helps guide community leaders in making decisions regarding future planning and investments. Adopted by the City Commission in May 2004, the Master Plan contains a detailed inventory of existing recreational infrastructure, community description, action plan, and a five-year capital improvements schedule. The Action Plan consists of focused goals and several objectives for

- a. Establish specific standards for all maintenance activities/ functions.
- b. Implement an Assets Management Program that includes regular evaluation of parks and facilities and an annual reporting process outlining physical conditions at all parks and facilities.
- c. Maintain a Capital Improvements/ Major Park and Facilities Repair Projects Program. Update the program priorities annually. Develop a process to involve residents/ receive resident feedback in forming priorities.
- d. Encourage private sector involvement in the development/ maintenance of local open space and recreational opportunities.
- e. Develop neighborhood/ community parks within new residential neighborhoods as growth occurs according to the City-wide Comprehensive Framework Plan.
- f. Consider land acquisitions and preserve green spaces in accordance with the City-wide Comprehensive Framework Plan.

2. Continue to maintain a linear park system that links recreational facilities, parks, protected natural resource areas, to create a distinctive open space and conservation system for the enjoyment of residents.

- a. Link the great variety of passive and active recreational opportunities available to local residents into one community-wide network by expanding the linear park system using both on-street and off-street connections.
- b. Secure appropriate levels of funding to support annual linear park maintenance costs.

- c. Encourage private investment/ development of linear paths within new or expanding neighborhood or residential housing development.
- d. Link existing and emerging new neighborhoods to the existing linear park system when the opportunity exists.
- e. Collaborate with other regional trail groups. Foster the inclusion/ connection of our linear park system within a regional transportation/ recreation network including linkage with open space in neighboring jurisdictions.
- f. Enhance Battle Creek’s image and quality of life by promoting awareness, accessibility, and regional use of our community-wide linear park system.

## PARKS AND RECREATION MASTER PLAN NON-MOTORIZED RELATED CAPITAL IMPROVEMENT PROJECTS

Year	Estimated Total Cost	Funding Source	Facility	Item Description
2006	\$50,000 (Phase I)	GF	Woodland Park	Woodland Park Site Planning/ Impr; Phase I –Planning/Engineering & trail development.
2006	\$50,000 (Phase I)	GF	Linear Park	Linear Park repairs-existing path- Replacement of sections of existing pathway
2007	\$340,000	GF, SF	Linear Park	L.P. Expansion/Southside Connector – Planning /Engineering & Land Acquisition
2007	\$380,000	GF, SF	Woodland Park	Improved trail development
2007	\$1,400,000	SF, SGF	Kalamazoo Riverfront	Downtown Kalamazoo Riverfront Development; Planning/Engineering & Kayak run construction
2007	\$50,000 (Phase II)	GF	Linear Park	Linear Park Repairs-Existing Path- Replacement of sections of existing pathway
2007	\$450,000	GF,SGF, SF	Willard Beach	Willard Park/Beach Impr.: Complete park master plan- New path, playground, & restroom
2009	\$1,000,000	GF, SF	Linear Park	L.P. Expansion/Southside Connector
2009	\$150,000	GF,SF	Linear Park	L.P. Expansion/Southside Connector—Trail Head at Washington Street Bridge
2009	\$250,000	GF,SF	Linear Park	L.P. Expansion/Southside Connector-Watkins Rd. from Helmer to S. Minges
2010	\$1,000,000	GF,SF,SGF	Kalamazoo Riverfront	Downtown Kalamazoo Riverfront Development: Phase III-Linear Park Trailhead at Mill Pond
2010	\$50,000 (Phase III)	GF	Linear Park	Linear Park Repairs- Existing Path- Replacement of sections of existing pathway.

The Master Plan Update also includes a capital improvements schedule outlining recreation projects and budgets through 2010. Capital improvement projects that relate to non-motorized systems are included in the table on the previous page.

**CITY OF BATTLE CREEK COMPREHENSIVE PLAN**  
A new City of Battle Creek Comprehensive Plan was developed in 1997, the first major update in nearly 30 years. The 1997 Comprehensive Plan merged the former Battle Creek Township and City of Battle Creek planning documents, something that had not been done since the merger of these two units of government in 1983.

The Plan outlines policies for land use, roadways, utilities, and other City services, including parklands and trailways, to guide the future growth and development of the City. The main focus of the Comprehensive Plan was to define a community-established “vision” for the City of Battle Creek through the year 2020.

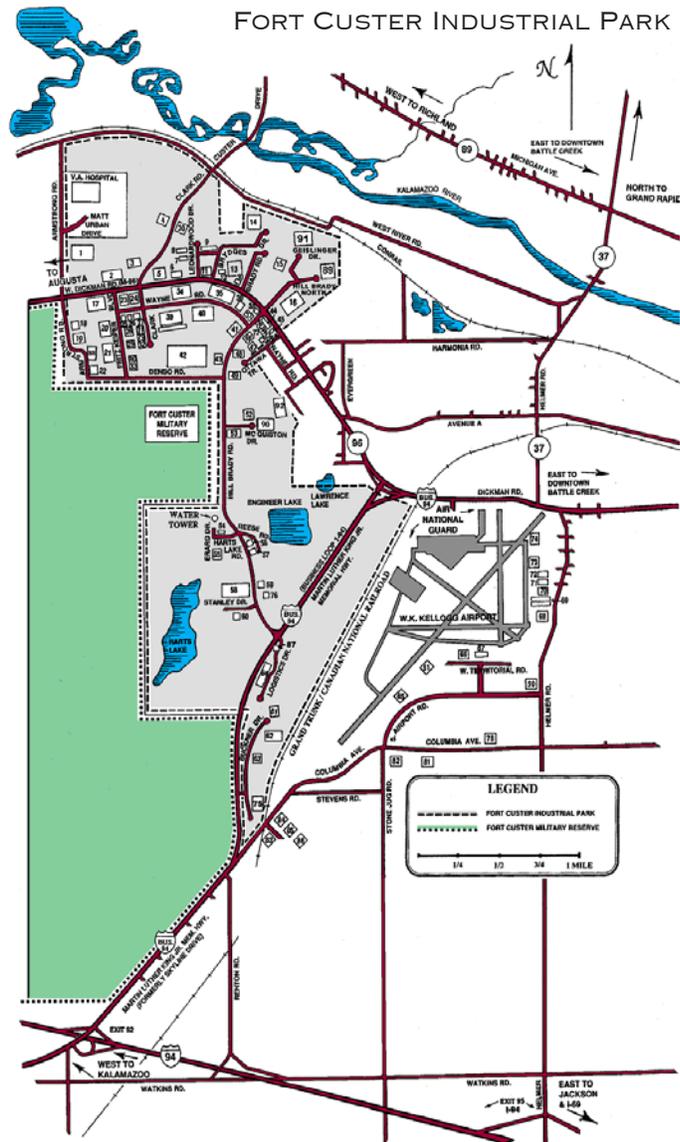
The City is currently working to update the Comprehensive Plan which will include an update of the demographic information with 2000 Census data, revisiting the vision statement, and evaluating the future land use plan to determine if adjustments are necessary. The updated Comprehensive Plan will also incorporate information that may have been compiled through other planning efforts, including the Parks and Recreation Master Plan, W.K. Kellogg Airport Master Plan, and this Non-Motorized Transportation Network Plan.

**FORT CUSTER INDUSTRIAL PARK TRANSPORTATION MASTER PLAN**

The 2004 Fort Custer Industrial Park Master Plan evaluates existing conditions in the Industrial Park, and provides recommendations for the Short Term (5-year) and Long Term (20-year) traffic conditions, based on projected traffic demand. The evaluation focused on four main routes: BL-94/Columbia Avenue, Helmer Road, M96/Dickman Road, and MLK Boulevard. Traffic analysis found that the road system in and around the Industrial Park functions well. Over the next 20 years, the Master Plan recommends the widening of two road segments. The first includes the stretch of BL-94, from I-94 to Dickman Road. The Plan notes that the segment from I-94 to Hill Brady Road is in the BCATS 2025 Transportation Plan as a Recommended Project in 2016 for congestion, pavement, and safety related reasons. The Fort Custer Industrial Park Transportation Master Plan also recommends widening Columbia Avenue, just east of BL-94/MLK, to accommodate an intersection modification at Columbia Avenue and BL-94/MLK.

**BATTLE CREEK AREA TRANSPORTATION STUDY**

The Battle Creek Area Transportation Study (BCATS) is the Metropolitan Planning Organization (MPO) for the greater Battle Creek area and is responsible for maintaining a continuing, comprehensive, and cooperative transportation planning program. In 2000, the BCATS Policy Committee approved the Transportation Plan for 2025. The Transportation Plan represents current priorities for the future and is updated every five years to reflect changing conditions. The 2025 Plan includes goals and



objectives that guided the development of the plan. Those related to non-motorized transportation include:

**GOAL 2: ACCESSIBILITY**

To provide all travelers in the community with reasonable access to important destinations such as residence, employment, recreation, community facilities and commercial centers.

Objectives:

- 2a. The transportation system should provide appropriate access, via motorized or non-motorized transportation, to and from major land uses and attractions within the BCATS area and within the region as a whole.
- 2b. The transportation system should minimize transportation barriers which put at a disadvantage the physically challenged, senior citizens, and persons who do not have automobiles available or have limited economic means.

The FY 2006-2008 Transportation Improvement Program (TIP) Project List developed by the Battle Creek Area Transportation Study includes several projects that may affect the non-motorized transportation vision in Battle Creek. See the Implementation Strategy Chapter of this document for more detail.

### DOWNTOWN BATTLE CREEK PLACEMAKING

As part of the Kellogg Foundation's Expert-in-Residence program, Project for Public Spaces, Inc. was brought to Battle Creek to conduct workshops and discuss how public spaces in downtown could be enhanced in order to positively change how these spaces are used in the future. A summary document was completed in June 2005 and focused on three key sites within the downtown core that, if improved, could have a catalytic impact on the area around them: Festival Market Square and adjacent buildings; Michigan Avenue between South McCamly and NE Capital Avenue; and the riverfront area near the old train station. Many of the short- and long-term recommendations for these areas included making them more pedestrian- and bicycle-friendly, improving accessibility, creating bike lanes and connections to the Linear Park, improving signage, etc.



Downtown Battle Creek  
Placemaking

June, 2005



### SIGNAGE AND WAYFINDING PROGRAM

Battle Creek Unlimited and the City of Battle Creek recently developed a signage and wayfinding program for the downtown area. The report looks at existing conditions and provides proposed designs to reflect the new downtown marketing program. The purpose of the wayfinding program is:

- To identify Downtown Battle Creek from city streets and thoroughfares;
- To enhance Battle Creek's public image through distinctive, helpful graphics;
- To promote Downtown Battle Creek as an entertainment destination over a shopping destination;
- To promote Battle Creek's history of health and fitness by encouraging pedestrians to use the walking opportunities in Downtown;
- To better organize and present information about Battle Creek's destinations to make them easier to find;
- To help drivers locate and identify parking convenient to their final destination; and,
- To simplify traffic patterns by guiding drivers along the most convenient paths.

### SAFE ROUTES TO SCHOOL PILOT PROGRAM

Westlake Elementary School was one of only eleven schools in Michigan chosen to pilot the Governor's Safe Routes to School program. A committee of Westlake staff, students and community members worked with representatives from the Governor's Council on Physical Fitness, Health & Sports identifying safe routes for students to walk and bike to school.

The school is piloting a two-year Safe Routes to School initiative which will improve options for walking and biking to school. The Michigan Department of Transportation (MDOT) granted federal transportation enhancement funds last year to the Governor's Council on Physical Fitness, Health and Sports. These funds are being used to develop strategies and resources that will empower all Michigan's elementary schools to improve their walking and biking environments for an active commute to school.

As a pilot school, Westlake has a local team consisting of a school administrator, teacher, parent, student leader, law enforcement officer, city staff, and others who work together to assess attitudes and behaviors of parents and students, analyze the physical environment leading to the school and research related policies. From this work they are creating recommendations and an action plan for making improvements.

### KANOE THE KAZOO

Since 2003, hundreds of area residents and decision makers have participated in the Kanoe the KaZoo event each summer. Organized by the MSU Extension and the Kalamazoo River/Lake Allegan Watershed Phosphorus Reduction Committee, the canoeing trip provides an opportunity to learn, discover and enjoy the Kalamazoo River and its tributary streams and lakes. In 2005, 15 events were planned from June through October. The purpose of the events are to:

- Celebrate the watershed
- Rediscover the valuable regional resource
- Educate decision makers
- Educate the general public
- Promote public use and stewardship of the watershed
- Discuss publicly the future of the river and watershed

Several events are within the Kalamazoo River, Battle Creek River, and Goguac Lake within the City of Battle Creek.

**EXISTING CONDITIONS WITHIN BATTLE CREEK**

In addition to the existing non-motorized system within Battle Creek (see map on pg. 22), the emerging regional non-motorized system, and the various related planning initiatives, there are a number of factors that have been considered in order to develop the long-term non-motorized vision. These are discussed in more detail on the following pages and include:

- Primary Clusters of Activity and Destinations
- Population Density
- Future Land Use
- Vehicular Speed Limits
- Vehicular Traffic Volumes
- Bus Routes
- Planned Road/Bridge Improvement Projects
- Existing Policies and Ordinances

The City has been extremely successful in implementing several miles of an off-road trail system and has worked to implement and expand various non-motorized facilities. This existing system, and particularly the Linear Park, serve as a foundation to build upon and expand. The images on the following pages document some of the existing conditions within the City. In the Fall of 2005, as part of a pilot program, the City’s first on-road bike lanes were installed along Helmer and Elm. Bike lanes have been designed for Washington Avenue between Goodale and Michigan Avenue for construction in 2006. Other bike lane projects planned in 2006 include Emmett (Washington to East), Cliff (Main to City limits), Riverside (Dickman to Burnham), LaVista (Goguac to Columbia), and East (Emmett to Capital).

**BATTLE CREEK LINEAR PARK**

The Battle Creek Linear Park provides a recreational, educational, and transportation corridor for the City’s residents and visitors. The Linear Park contains more than 17 miles of paved path, including four loops, interpretive signage, and a host of amenities. Accessible from several parking and non-motorized pathways, the Linear Park provides picnicking, playground, and fishing opportunities for people of all ages and abilities. The Park

also links several points of interest throughout the City, including Leila Arboretum, Cereal City U.S.A., the Central Business District, Horseshoe Bend Park, Takasaki Gardens, and many others. Four schools are accessible from the trail: Battle Creek Central High, Northwestern Jr. High, and Washington and Dudley Elementary. In addition, Kellogg Community College and Miller College are adjacent to the existing trail system.

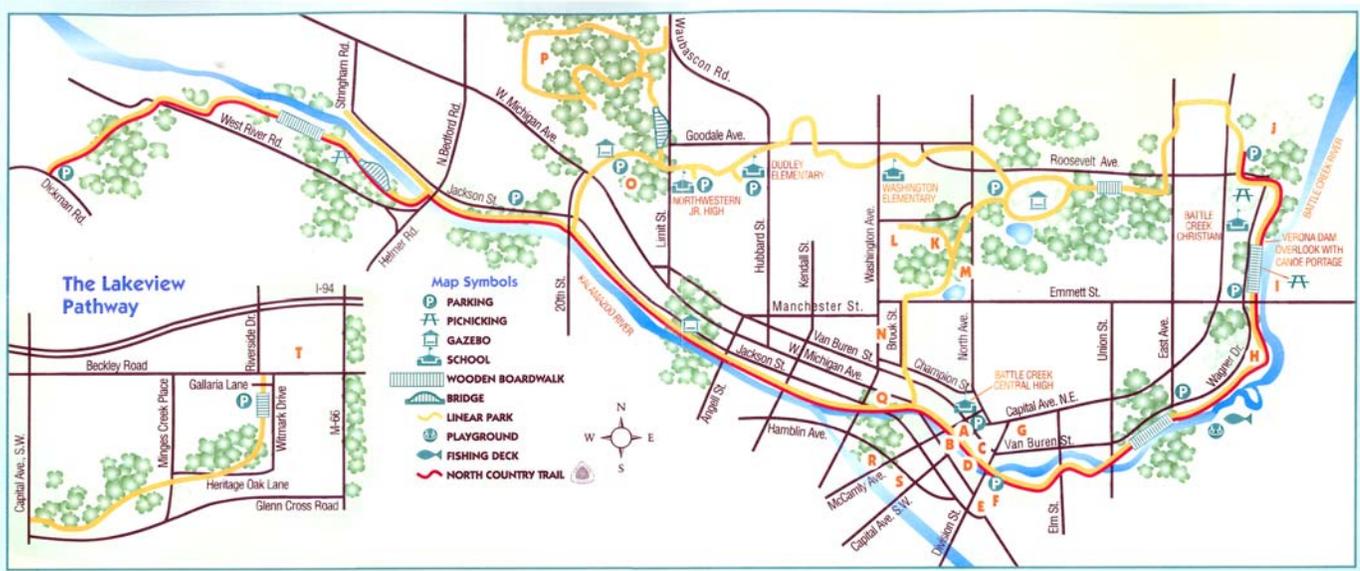
The Linear Park is a key link in regional and statewide initiatives to connect communities through a network of non-motorized paths. Also, as was previously described, a large portion of the Linear Park has been designated as a segment of the North Country National Scenic Trail (NST) which is planned to extend from New York State to North Dakota. The Linear Park is also planned to connect into the Kalamazoo River Valley Trailway.

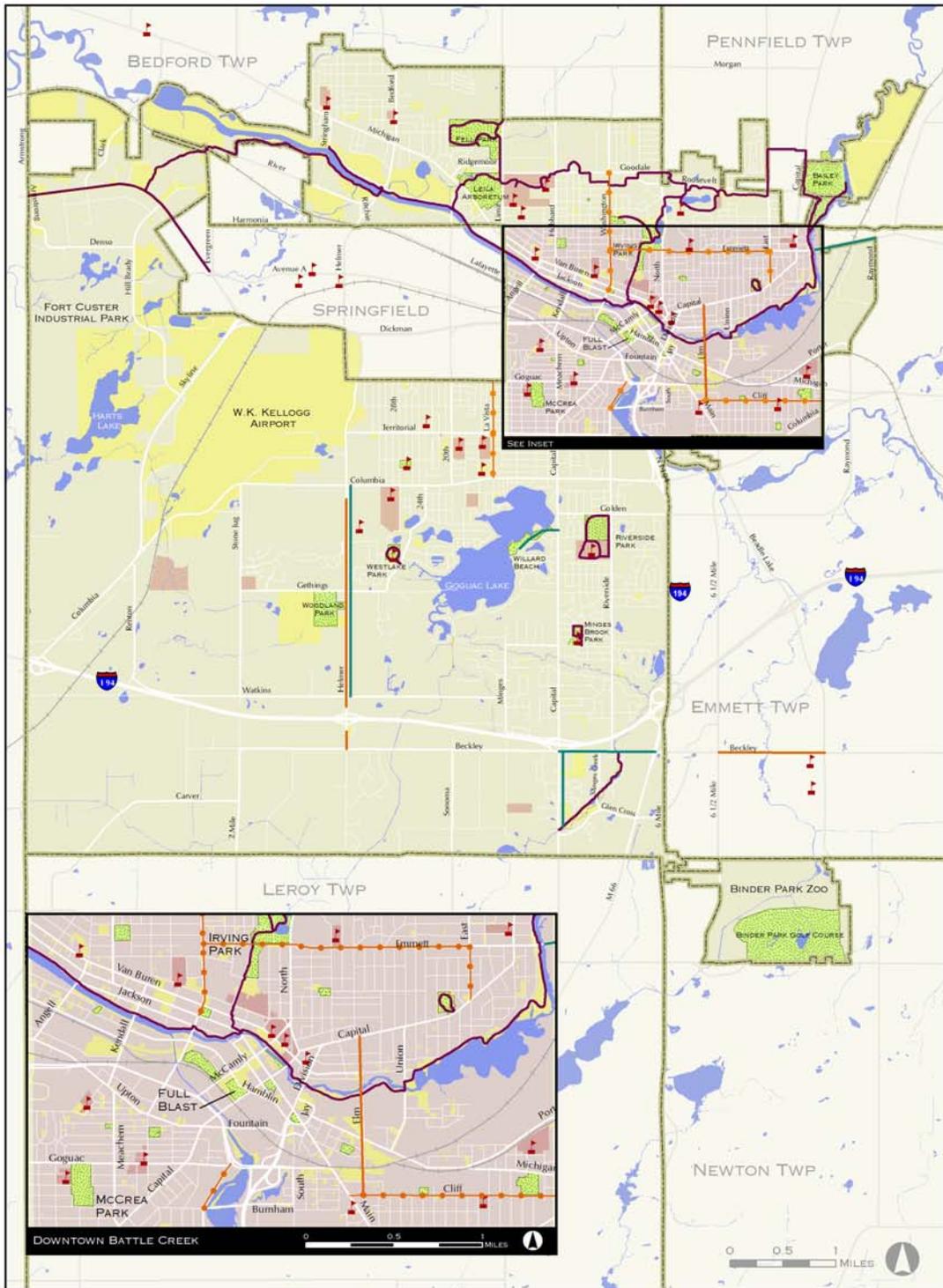
**PRIMARY CLUSTERS OF ACTIVITY AND DESTINATIONS**

As is depicted on the map (page 23), there are several elements and facilities within (and just outside) the City of Battle Creek that are primary clusters of activity and destinations to provide for non-motorized connections. These are described below in greater detail.

**Schools**

The City of Battle Creek is serviced by two public school districts: Battle Creek Public Schools and Lakeview Schools. All of the school facilities are considered primary destinations in terms of making non-motorized connections, particularly in conjunction with the Safe Routes To School program. The Battle Creek Public School District includes 11 elementary schools, 4 middle schools and 1 high school. The Lakeview School District serves over 3,300 students each year through its K-12 and Alternative Education programs. In terms of facilities, the district includes Lakeview High School, a middle school, a sixth grade building, and four elementary schools. Westlake Elementary School, in the central portion of Battle Creek, participated in the Michigan Safe Routes to School pilot program.





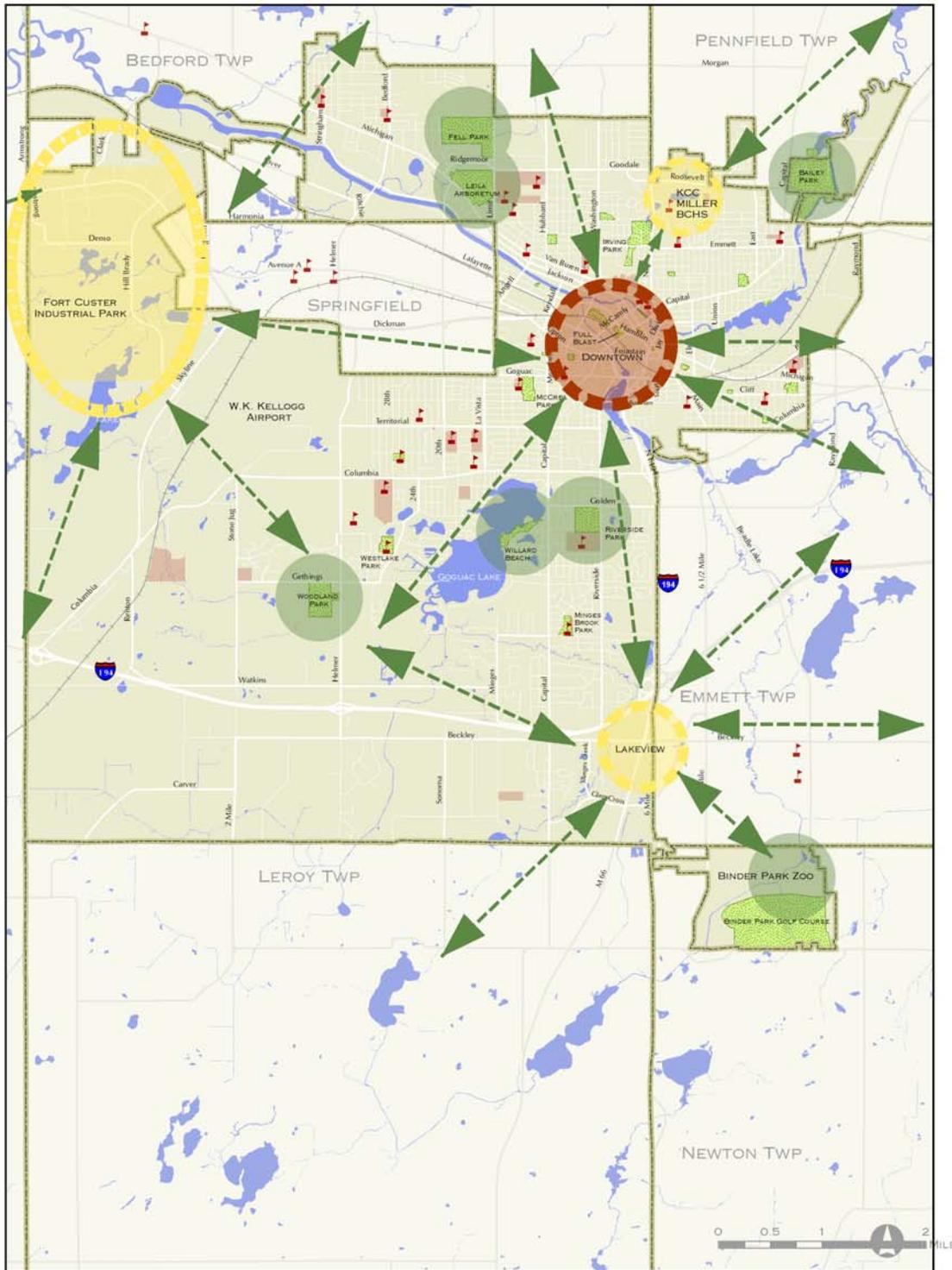
**EXISTING CONDITIONS**

**CITY OF BATTLE CREEK  
NON-MOTORIZED SYSTEM**

- Existing Shared Use Trail
- Existing Bike Lane
- Existing Wide Sidewalk
- Planned Bike Lane
- Parkland
- City Owned Parcels
- School Property
- School

SOURCE DATA:

PREPARED BY: **WADETRIM**  
RA TR001-017  
 MC Existing Conditions MAP  
 DECEMBER 2008



**ACTIVITY CLUSTERS AND DESTINATIONS**

**CITY OF BATTLE CREEK  
NON-MOTORIZED SYSTEM**

- Destinations
- Parkland
- Primary Activity Clusters
- School Property
- Secondary Activity Clusters
- School
- Provide Connections



FELL PARK



WILLARD BEACH



M-66 AT BECKLEY ROAD



LINEAR PARK SOUTH OF BECKLEY



HELMER ROAD AT BECKLEY



SKYLINE ROAD, SOUTH OF HILL BRADY



LINEAR PARK - DOWNTOWN



PEDESTRIAN BRIDGE NEAR CEREAL CITY USA



TRAIL IN HUNTINGTON HILLS SUBDIVISION



HELMER ROAD



RIVERSIDE ROAD AT RIVERSIDE PARK



LINEAR PARK ALONG BATTLE CREEK RIVER

## **Parks**

The parks system within the City of Battle Creek is one of the gems of the community and is a primary destination in terms of providing non-motorized facilities to connect people to the parks and natural resources. The Battle Creek parks system (over 1,100 acres) includes:

- 5 mini parks
- 9 neighborhood parks
- 10 Community Parks
- 2 Regional Parks
- Metcalf Lake Natural Area
- 4 School Parks
- 3 Indoor Facilities

## **Downtown Battle Creek**

As is described by Battle Creek Unlimited, Inc., downtown Battle Creek is the major service corridor of the community. Entertainment, specialty shops, corporate headquarters, professional and financial services, and government offices are located in the Central Business District. The Downtown Blueprint, completed in 2003, indicates the desire to make the Downtown area “the center of community life and the community’s hub”. The Downtown Blueprint also includes the term “walkable” and often makes references to the desire to walk to the downtown area. Destinations within the downtown area are numerous and include places such as the Family Y Center, the Farmers Market, the Art Center, Cereal City USA, the waterfront, retail shops, restaurants, etc.

## **Fort Custer Recreation Area**

As was previously described, the Fort Custer State Recreation Area is located just west of the City of Battle Creek and includes an extensive network of popular hiking, mountain biking, and bridle trails. This is an obvious destination in terms of providing non-motorized connections between the City and the Recreation Area.

## **Lakeview Square Mall Area**

The Lakeview Mall area was identified through public surveys conducted by the Parks and Recreation Department (2005) as a primary destination in the community. The mall is located along Beckley Road in the southeast section of the City. The mall includes major retailers such as JCPenny, Sears, Marshall Fields, Bath & Body Works, Old Navy, Barnes & Noble Booksellers, etc.

## **Kellogg Community College/Miller College/Battle Creek Health Systems**

The Kellogg Community College main campus as well as the Robert B. Miller College are located in the northeast portion of the City along North Avenue, south of Roosevelt. The Battle Creek Health System main campus is located at North Avenue and Emmett Streets. The college’s and health facility are primary destinations to provide non-motorized connections to and from.

## **Fort Custer Industrial Park**

The Fort Custer Industrial Park is the largest industrial park in Michigan at 3,000 acres. There are approximately 90 companies located in the Industrial Park employing 9,400 individuals. The world-class park is home to 22 international-based companies.

This is a primary destination within Battle Creek as a significant place of employment for many area residents.

## **POPULATION DENSITY**

The density of a residential population determines if an area is capable of economically supporting a transit system. Increased population density introduces a critical mass of people who provide comfort and security to each other with their combined presence. As is illustrated on the map on page 27, population density (most people per square mile) is greatest in the Census Tract to the northeast of downtown and to the south. The large number of residential developments in the southeastern portion of the City are also evident.

## **FUTURE LAND USE**

The City of Battle Creek Future Land Use plan (page 28) is designed to encourage more compact growth with the incremental expansion of already developed areas guided through planned infrastructure extensions. The plan includes the delineation of a limited urban services boundary, beyond which full water and sewer to support intensive development is not planned until after the year 2020. The plan encourages land use patterns that support walking, biking and transit to reduce auto dependence and to increase access for those who do not drive. The future land use plan also encourages open space preservation to protect the functioning of important environmental systems (wetlands, floodplains, woodlands, creeks, and drains) and to define and link groups of neighborhoods.<sup>1</sup>

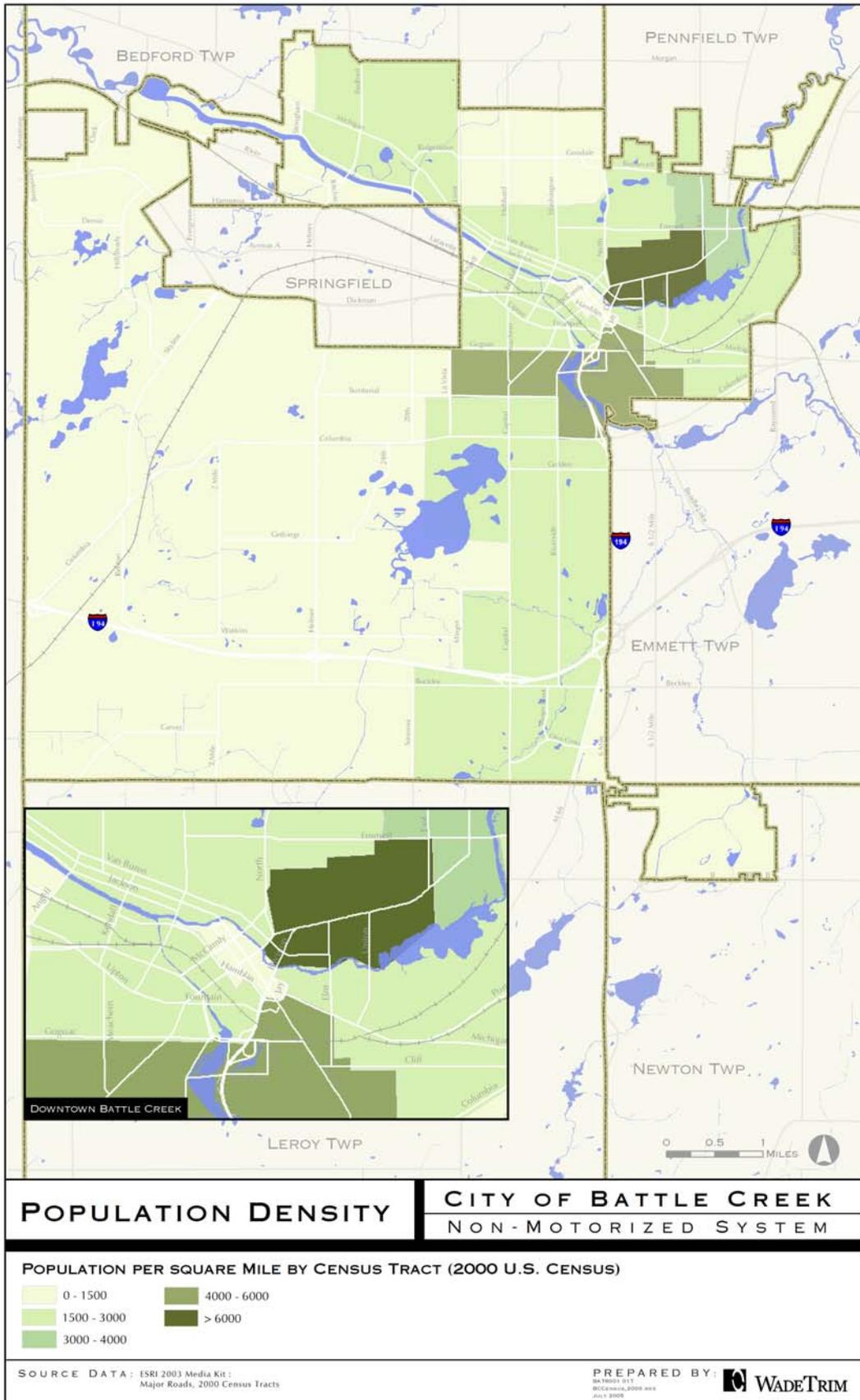
## **VEHICULAR SPEED LIMITS AND VOLUMES**

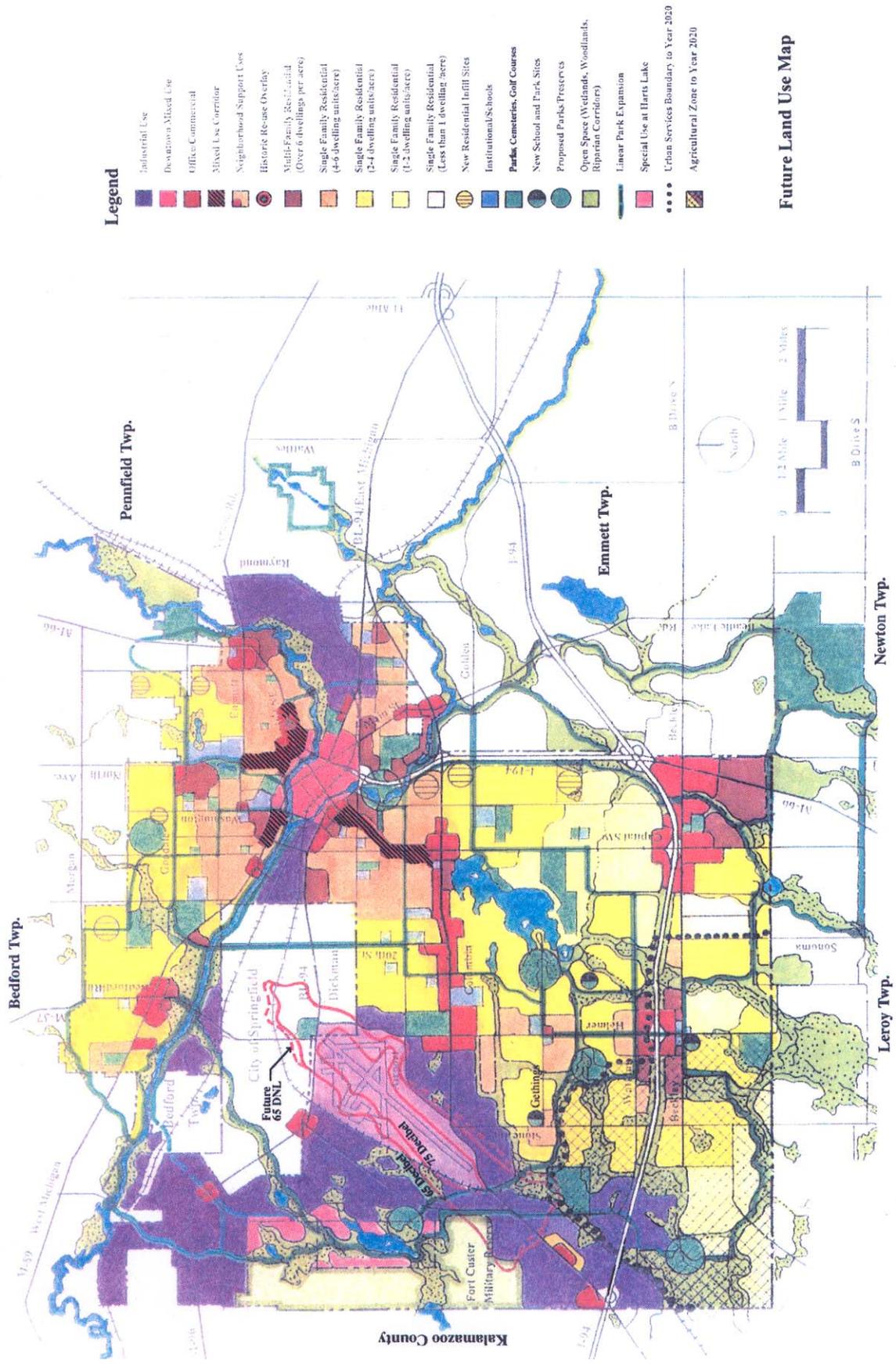
It’s generally accepted that when vehicular speeds are less than 25 mph, and traffic volumes are fairly light, no bike-specific facilities are necessary. At these low speeds and volumes, bicyclists can fairly comfortably share the road with vehicles without delineation or separation. However, there comes a point where the speed/volume characteristics of a roadway are too great for a cyclist to ride comfortably and safely without being separated (physically or with markings) from the vehicle traffic.<sup>2</sup>

The map on page 29 documents the posted speed limits on the primary road network within the City of Battle Creek. This was used as another tool in selecting non-motorized routes and facilities.

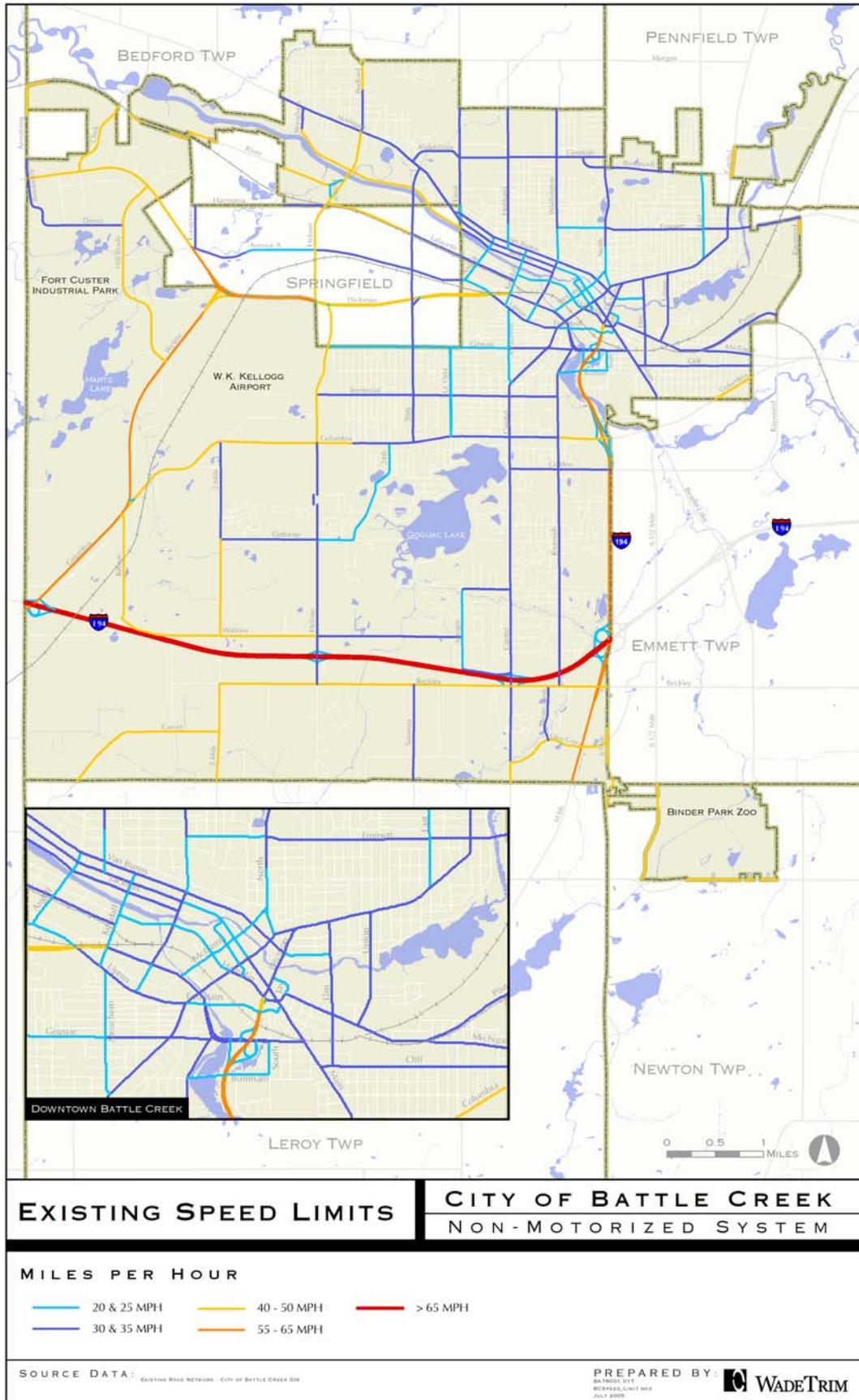
<sup>1</sup> City of Battle Creek Parks and Recreation Master Plan 2004-2008.

<sup>2</sup> Bicycle Facility Selection: A Comparison of Approaches. Michael King, Pedestrian and Bicycle Information Center, August 2002.





# Battle Creek Parks and Recreation Master Plan Update



## BUS ROUTES

The Battle Creek Transit Department is responsible for providing public transit to Battle Creek area residents. Regular route bus service is provided throughout the Cities of Battle Creek and Springfield, and the Townships of Bedford, Emmett, and Pennfield as is illustrated on the following map. There are approximately 460 Bus Stop signs throughout the area and shelters are provided at many of the major bus stops. There are nine primary bus routes that primarily focus on the downtown area, including Territorial, Columbia, Capital, and Michigan Avenue.

It is important to understand the location of the bus routes so that non-motorized connections can intersect with bus routes and stops and therefore provide the opportunity for multi-modal commutes and experiences. The Transportation Center in downtown Battle Creek is also an important activity center where non-motorized connections and provisions should be accommodated such as bicycle parking and bike racks on buses in order to facilitate and encourage bus/ped/bike trips.

## PLANNED ROAD/BRIDGE IMPROVEMENT PROJECTS

The City of Battle Creek Engineering Division of the Public Works Department has developed a master plan of projects through the Year 2013. Projects vary from micro-surfacing and resurfacing to complete reconstruction. The planned road and bridge improvement projects are primary opportunities for bike lane and/or trail implementation.

## EXISTING POLICIES AND ORDINANCES

With the exception of the brief wording regarding the Linear Park system, and the prohibition of bikes on sidewalks in the downtown area (see below), the current Battle Creek Municipal Code does not specifically address non-motorized transportation nor does it contain provisions for trails or bike lane development, design, maintenance, parking, behavior, safety, etc.

Chapter 1060: Parks and Public Grounds of the Battle Creek Municipal Code recognizes the Linear Park System and Map and highlights brief trail rules:

- (1) No person shall operate, stand or park a vehicle on any pathway of the Linear Park System, unless such vehicle is an authorized emergency vehicle responding to an emergency call. Further, this rule shall not apply to the operation of vehicles owned or operated by the City, or by contractors thereof, while engaged in the repair, maintenance, construction, improvement or police patrol of the Linear Park System.
- (2) The City Manager or his or her designee is hereby authorized to make such additional rules and regulations, subject to the approval of the City Commission, pertaining to the conduct and use of the Linear Park System, as are necessary to administer the same and to protect public property and the health, safety and welfare of the public.

In addition, the City has adopted the Uniform Traffic Code (Chapter 410, Rule 618a) which states that "no person shall use or ride a bicycle, scooter, skateboard, roller skates or in-line skates upon any sidewalk in the Central Business District".





### PURPOSE OF THE MASTER PLAN

The purpose of this project is to develop a 20-year non-motorized vision for both on and off-road non-motorized facilities that will provide a convenient and safe option to link people, schools, businesses, parks, natural resources, and cultural and historic landmarks to each other as well as to adjacent communities and resources.

### GOALS FOR THE MASTER PLAN

- Be implementation oriented and serve as a guide for non-motorized trail, bike lane, and route signage planning, funding, design, and construction.
- Communicate in a highly illustrative manner, the vision, goals, and possibilities for non-motorized connections.
- Communicate the various benefits of a connected non-motorized system.
- Utilize community and stakeholder involvement and input to develop the non-motorized vision.
- Utilize the plan to establish Battle Creek as a non-motorized friendly community.

The City of Battle Creek developed this Non-Motorized Vision for both on- and off-road non-motorized facilities that will link people, schools, businesses, parks, natural resources, and cultural and historic landmarks to each other as well as to adjacent communities and resources. The City is committed to developing a connected non-motorized system due to their many benefits including: health, recreation, quality of life, alternative transportation, pollution reduction, conservation of natural resources, and increased tourism and property values.

The Non-Motorized Vision and accompanying Network map is intended to serve as a guide to non-motorized system planning, funding, design and construction into the future. The Non-Motorized Network map represents a long-term vision for non-motorized facilities. Significant amounts of work, further planning, public involvement, design, and implementation efforts will need to follow this initial planning effort.

As time progresses, additional information is collected, the non-motorized network begins to emerge, etc., it is highly likely that the networks and corridors will change or move due to a number of potential issues such as public opinion, funding, land use, property ownership, and many others. This master plan is to serve as a foundation and beginning point for non-motorized connections within the City of Battle Creek.

Understanding that this master plan is a foundation for the City of Battle Creek, staff from the Parks and Recreation Department and the Engineering Division, guided its' development. Utilizing existing GIS information, the City staff met on a regular basis to confirm the accuracy of the information, provide input as to proposed improvements, desirable connections, destinations, and development patterns. The City also held public workshops to garner input and to assist in plan formulation for a potential non-motorized network, priority routes and corridor connections. In addition, the City held several individual meetings with special interest groups such as the County Road Commission, MDOT, the City of Springfield, senior staff, and the City Manager's Office to provide an overview of the project and discuss the possibility of a variety of routes and corridors. An overview presentation was given to the City Commission in December 2005 and a presentation was given to the Planning Commission in February 2006. The planning process culminated with the identification of a non-motorized network that traverses the City providing connections to the downtown, significant natural resources, parkland, commercial centers, institutions, neighborhoods and schools, as well as routes that provide connections into non-motorized systems that currently exist or are being planned in adjacent communities.

**FACTORS THAT INFLUENCE SELECTION OF CORRIDORS:**

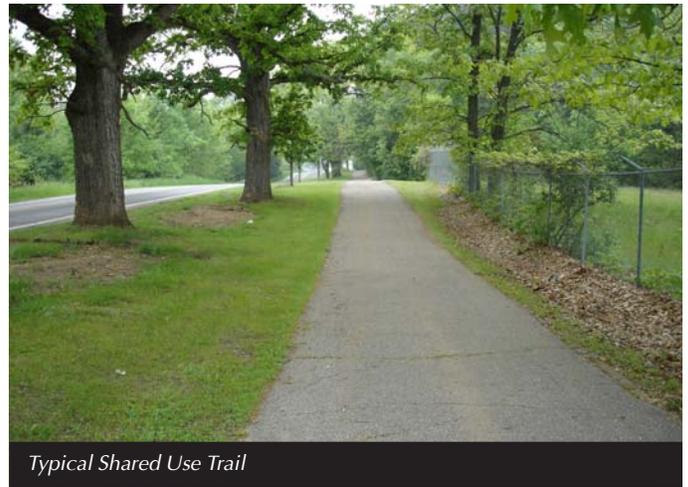
- Emerging national, state, and regional system
- Location of existing system
- Primary clusters of activity
- Related initiatives and efforts
- Population density
- Future Land Use Plan
- Bus route locations
- Planned road reconstruction and resurfacing
- Traffic volumes and speeds

**NON-MOTORIZED NETWORK TYPES**

Non-motorized facilities and accommodations can take many forms and designs. During the development of the Master Plan, it became clear through field observations, city staff comments, as well as public input, that a variety of "types" of non-motorized systems will likely be utilized to, over time, develop a connected network. The "types" of non-motorized systems planned within the City of Battle Creek are described on the following pages and maps.

**SHARED USE TRAIL**

The existing Linear Park system is an example of a shared use trail. Shared use trails are off-road systems, typically 10' to 14' wide and can accommodate pedestrians and bicyclists. Many times shared use trails are found along side rivers, streams, and lakes, or within a road right-of-way. Several segments of shared use trail are proposed in the Non-Motorized Transportation Network. These include extensions of the current Linear Park system, trails within rail or utility corridors, as well as shared use trail segments where on-road bike lanes are not preferred and/or there is sufficient right-of-way without extensive curb cuts.



*Typical Shared Use Trail*

**BIKE LANE**

Bike lanes are on-street facilities that are typically 4 to 6 feet in width and are delineated by a six-inch stripe on the left-hand side of the lane, as well as in-pavement markings such as the symbol of a bicycle and arrow. They designate a space on the roadway exclusively for the use of bicyclists. Motor vehicles are not permitted to drive, park or stand in the bike lane. However, right turning vehicles can enter the bike lane at intersections to complete their turn.



*Typical Bike Lane*



Typical Bike Lane Pavement Marking

**PAVED SHOULDER**

The American Association of State Highway and Transportation Officials (AASHTO) Guide for the Development of Bicycle Facilities notes that in less travelled areas “adding or improving paved shoulders often can be the best way to accommodate bicyclists” – and they have the additional attraction of providing a variety of benefits to motorists and other road users as well.

A paved shoulder refers to additional pavement width of at least 4’ that has been added to an existing roadway in order to more safely accommodate bicycles. Shoulders for bicycle use are not typically provided on roadways with curb and gutter.

On more rural roadways where bicycle travel is common or desired, wide paved shoulders are highly desirable. On secondary roadways without curb and gutter where there are few commercial driveways and intersections with other roadways, many bicyclists prefer riding on wide, smoothly paved shoulders.



Rendered Illustration of Paved Shoulder

**ROUTE SIGNAGE ONLY**

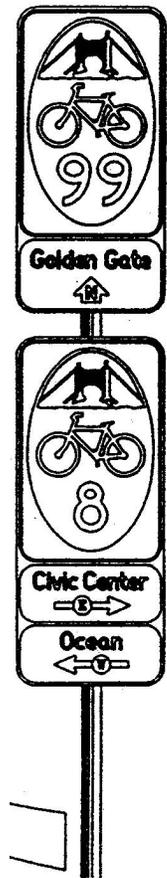
While Shared Use Trails, Bike Lanes, and Paved Shoulders should also include route signage in order to provide for way-finding by the user, several areas within the City have been designated as having no other treatment other than route signage. Roads designated only with route signage are done so in order to provide connectivity and are recommended as a bicycle route, but typically have low-volumes of vehicular traffic. Bike route signage typically follows a numbering system in order to create a network that can be followed locally and regionally.



The AASHTO Guide describes signed shared roadways (bike routes) as “those that have been identified by signing as preferred bike routes” and goes on to describe the reasons why routes might be so designated:

- continuity between bicycle lanes, trails or other bicycle facilities
- marking a common route for bicyclists through a high demand corridor
- directing cyclists to low volume roads or those with a paved shoulder
- directing cyclists to particular destinations (e.g. park, school or commercial district)

In addition, designation indicates that there are particular advantages to using the route rather than an alternative.



## BLUEWAY WATER TRAIL

The Kalamazoo and Battle Creek Rivers were discussed as designated Blueway Water Trails. This designation is intended to allow small boaters or other water vessels access to the waterways. Designation as a Blueway can assist in broadening awareness and education of navigable areas and natural resources. This designation may also lead to analysis for additional access points, signage, etc. Partnerships with the MSU Extension and the Kalamazoo River/Lake Allegan Watershed Phosphorus Reduction Committee (who sponsor the Kanoe the KaZoo event each year), can further this initiative.

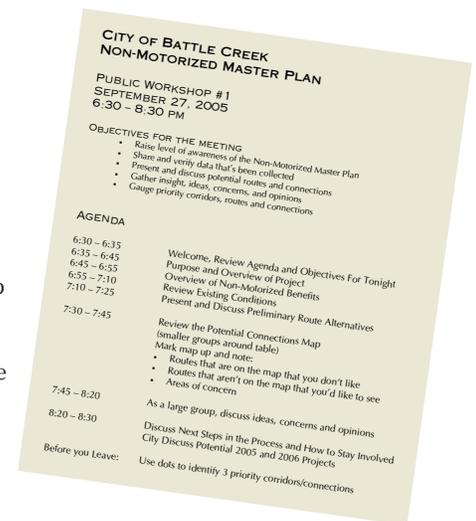


Two public workshops (September and December 2005) were also held in the development of this Non-Motorized Master Plan in order to better understand preferred routes, corridors, destinations, and facilities.

## WORKSHOP #1 SEPTEMBER 27, 2005

Approximately 35 people attended the public workshop. The purpose of the meeting was to raise the level of awareness of the Non-Motorized Master Plan; share and verify data; present and discuss potential routes and connections; gather insight, ideas, concerns, and opinions; and finally, to gauge priority corridors, routes and connections.

At the end of the workshop, meeting attendees were asked to utilize dot stickers and place them on the Potential Network map to begin to identify priority routes and corridors. Photos of the boards illustrate the priority routes of attendees.



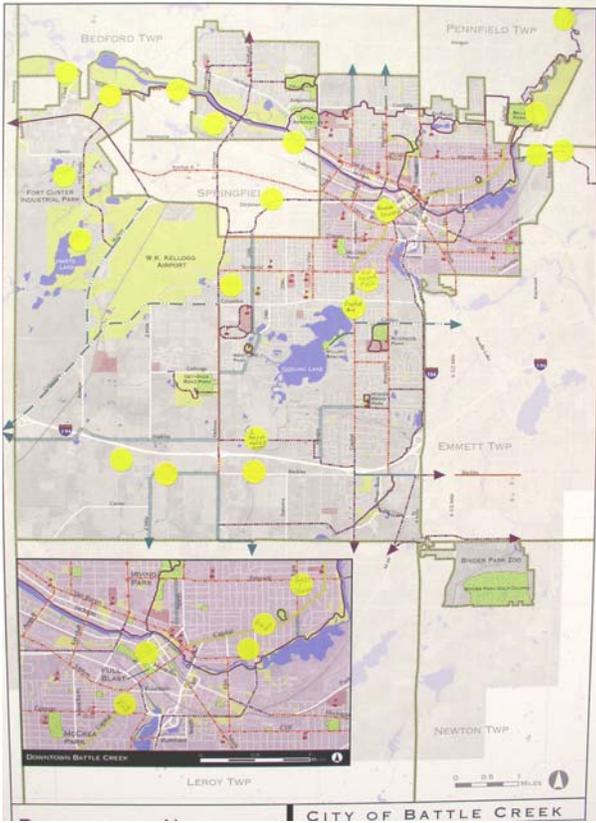
## PUBLIC INPUT

The City of Battle Creek developed an online survey to learn more about how often people walk, run, or bike in the City and surrounding areas. The survey also asked what streets/roads people currently use for biking, and which streets/roads they would like to use for biking.

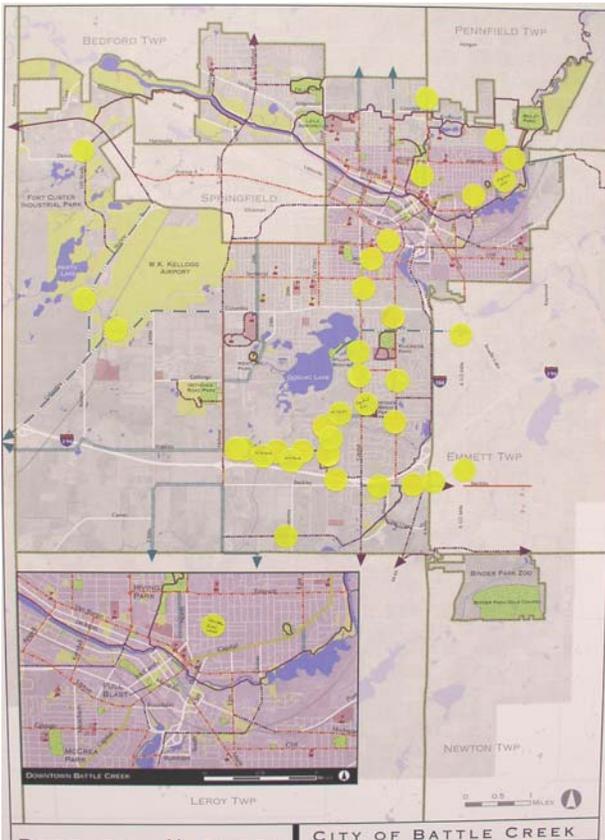
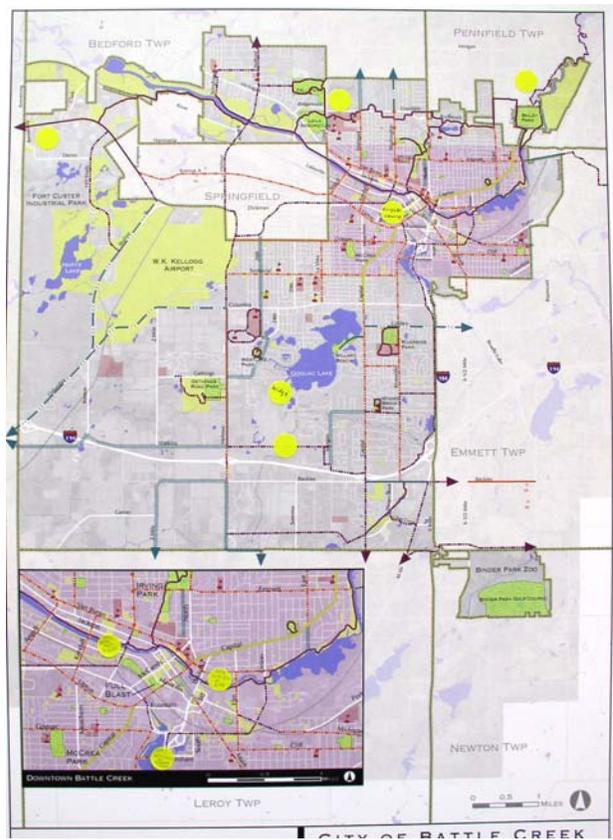
## TOP 10 MOST USED ROUTES/CORRIDORS Based on Results of Public Survey

Linear Park  
Capital Avenue  
Helmer Road  
Riverside Drive  
Watkins Road  
Columbia Avenue  
Fort Custer Trails  
Capital Avenue SW  
Michigan Avenue  
Beckley Road





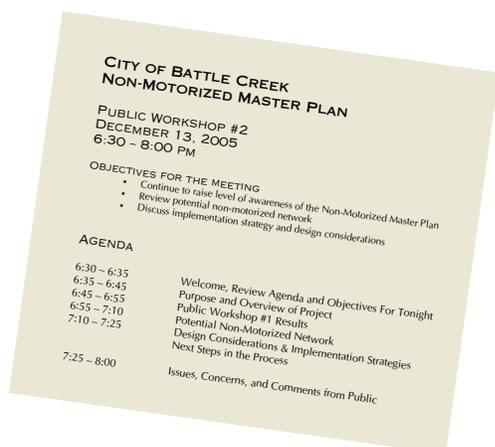
Yellow dots indicate preferences from Workshop #1



## WORKSHOP #2 DECEMBER 13, 2005

Approximately 25 people attended the second public workshop. The purpose of the meeting was to continue to raise awareness of the Non-Motorized Master Plan; to review the potential non-motorized network; to discuss implementation strategies and design considerations; and finally, to gather input, comments, and concerns regarding the Master Plan.

After an overview of the project and draft Master Plan, participants discussed a variety of issues and concerns regarding the proposed routes, connections, design considerations, and implementation strategies.



**PLANNED NON-MOTORIZED TRANSPORTATION NETWORK**

The city-wide map on the following page illustrates the foundation for a vision for both on and off-road non-motorized facilities that when implemented, will provide a convenient, and safe option to link people, schools, businesses, parks, natural resources, and cultural and historic landmarks to each other as well as to adjacent communities and resources.

As has been described, the Non-Motorized Transportation Network map represents a long-term vision and is intended to serve as a guide to non-motorized system planning, funding, design and construction into the future. Significant amounts of work, further planning, public involvement, design, and implementation efforts will need to follow this master planning effort.

Over time, it is highly likely that the networks and corridors will change or move due to a number of issues such as public opinion, funding, land use, property ownership, and many others. This master plan is a foundation and beginning point for non-motorized connections within the City of Battle Creek.

**ESTIMATED DISTANCES OF NON-MOTORIZED TRANSPORTATION NETWORK**

<b>Planned (2006)</b>	
Bike Lanes	5.4 miles
<b>Potential</b>	
Shared Use Trail	34.4 miles
Bike Lane	42.9 miles
Paved Shoulder	10.1 miles
Route Signage Only	6.2 miles

Based off of GIS calculations only and Non-Motorized Network Map.







The implementation strategies discussed on the following pages are actions that will work toward implementation of a connected non-motorized system as well as highlight the City of Battle Creek as a non-motorized friendly community. It is likely that over time the particulars and details of this plan, the proposed corridors, and the types of systems may change due to development patterns, funding opportunities, public opinion, etc. Because of this fact, this section of the Master Plan in particular should be reviewed and updated on a regular basis as priorities shift, segments are implemented, and funding opportunities and sources change.

This section summarizes recommended actions, evaluation criteria for prioritizing routes, cost estimates for implementation, recommendations regarding policies and ordinances, and potential funding sources. This section also references 3 conceptual designs that have been completed and are available in a separate document entitled “Non-Motorized Design Decision Document”.

*\*\* It should be noted that this Master Plan does not specifically address the need for sidewalks. Sidewalks are an essential element in providing for a connected, walkable community. Connected, continuous sidewalks should be constructed and provided for along all major thoroughfares.*

## INITIAL PRIORITY SELECTION CRITERIA

The Master Plan is a 20-year vision and will take time to fully implement. The criteria below have been developed in order to determine and select priority projects that will be the focus for implementation over the next 1 to 5 years. Many of the routes and corridors will come to fruition due to the timing of other road or development projects, however, there are other factors and elements that should be considered when determining the selection of the initial implementation projects. Over time, as the non-motorized system expands, priority route selection criteria will likely change.

### PRIORITY SELECTION CRITERIA

- Ease of implementation (few design conflicts and associated construction costs)
- Serves multiple destinations (convenient)
- Coincides with other project schedules (i.e. road reconstruction, park development, etc)
- Will improve and/or enhance non-motorized safety
- Provides connections to existing non-motorized facilities
- Part of a planned non-motorized network
- Connects to other transportation modes
- Frequency of estimated daily usage
- Includes school-related usage
- Degree of impact on vehicular traffic capacity

## RECOMMENDED ACTIONS

The following actions will assist in the implementation of a connected non-motorized system within the City of Battle Creek, Calhoun County, and region. The recommended actions have been broken into two categories: short-term actions and on-going actions. Short-term actions should be the focus of the first 5 years (2006 - 2011) of this plan. On-going actions are those things that will require continuous attention and focus throughout the life of the plan. The recommended actions are not listed in any order of priority as they are all essential to the plans success. These actions are in addition to the actual implementation of non-motorized segments and routes.

## SHORT-TERM ACTIONS

- Incorporate the Non-Motorized Plan into the Comprehensive Master Plan that is being developed by the Planning Department.
- Work with the Battle Creek Transit to develop and implement a "Bikes on Buses" program. The installation of bike racks on buses encourages and allows for intermodal commuting.



- Develop a City Bike Rack Program. Focus on providing bike racks at all public parks, schools, and facilities such as City Hall, the library, Transit Center, etc.

Develop a Bike Rack Program with Battle Creek Unlimited and the Chamber of Commerce to assist in the installation of bike racks in the downtown area, and at major employers and destinations throughout the City such as the hospital, industrial park, mall, and zoo.

- Work with the MSU Extension and the Kalamazoo River/Lake Allegan Watershed Phosphorus Reduction Committee to further expand opportunities for safe, low-impact water recreation on the Battle Creek and Kalamazoo Rivers such as canoeing, kayaking, and fishing.
- Develop ordinance and policy language that addresses and encourages non-motorized system connectivity (see Ordinance and Policy Recommendations).
- Develop a safety and education media campaign to raise awareness of the system and encourage its appropriate and proper use. Many safety materials have been developed across the country and are geared toward different audiences including children, teens, and adults. This education campaign should be targeted at the non-motorized user as well as the vehicular driver. The campaign should encourage alternatives to automobile travel and should also include strategies to increase helmet and light usage, rider conspicuity as well as safe bicycle and pedestrian behavior.

The City may also want to consider working with the Secretary of State's Office to incorporate non-motorized awareness, rules, and safety issues into the Driver's Education Program and License Testing.

- As segments of the system are proposed for construction, it will become more and more necessary to develop a continued, consistent and dedicated maintenance program (on-road and off-road) as well as the adequate funds to support the program.
- Develop a coordinated signage and way-finding program for the non-motorized system (both on- and off-road). Consistent signage that enables the user to know where they are, where they're going, as well as destinations in the area will provide for a more enjoyable and beneficial system. This effort should be closely coordinated with the Downtown Wayfinding Program.
- Identify and designate bike routes in the City with route number or route name signs. The bike route can connect segments of shared use trails with bike lanes or designated bike routes in adjoining communities. Major north-south and east-west corridors, as well as facilities that connect major destinations such as downtown to residential areas, are good candidates for route signs. It is typically desirable to have the public involved in route names through contests such as "Name that Route".

## ON-GOING ACTIONS

- Hold an annual meeting with key stakeholders such as MDOT, Calhoun County and adjacent communities to recognize and celebrate accomplishments, and discuss upcoming non-motorized projects and efforts. This will ensure continued momentum, coordination, cooperation, and connectivity.

Several segments of the proposed system are within road rights-of-way. Significant coordination, particularly with MDOT and the County Road Commission will be required on a continual basis to discuss the potential for providing space for non-motorized facilities or accommodating non-motorized facilities within a planned design and construction project. This includes rehabilitation and/or replacement of bridges.

- Raise the level of awareness of the plan both internally and externally. Further planning, design, construction, and maintenance of the non-motorized system will require cooperation and coordination from multiple departments including Parks and Recreation, Engineering, and Planning. Continual awareness and implementation of the plan by the Planning Commission and City Commission will also be important.

Public awareness of the plan will also be important to its eventual implementation. Regularly scheduled, and repeated articles in the City newsletter, local newspaper, cable television, etc. will assist in ensuring public awareness. This could be coupled with the education and safety campaign.

- The Non-Motorized Transportation Network Map should be reviewed and updated on an annual basis. For example, routes and segments that have been constructed should be illustrated as such, and system changes in terms of type of facility or route should be noted. An updated map and/or associated GIS files should be distributed to the appropriate Departments within the City, as well as entities such as MDOT and Calhoun County.
- Work with developers to encourage the inclusion of pedestrian or non-motorized connections as part of their development. Developers should not only ensure connectivity within their project, but also to the adjacent (whether existing or planned) emerging network. The City should meet with the property owners and developers early to discuss voluntary easements or dedications of land if necessary to ensure the continual connectivity of the non-motorized system. The provision of "non-motorized" connections should be a requirement during site plan review.
- Support and encourage continued and expanded participation in the Safe Routes to School Program.
- Continuously monitor and investigate land acquisition opportunities that would enable the extension and/or continuous connection of the non-motorized system.
- Work with the Battle Creek Police Department to raise awareness of the non-motorized plan and encourage enforcement of vehicular, bicycle, and pedestrian laws. Also seek to increase officer bicycle patrol.

## ORDINANCE AND POLICY RECOMMENDATIONS

There are a variety of ordinances and policies that can be adopted to encourage and promote a safe, connected non-motorized system within the City of Battle Creek. While these should be drafted to suit the particular needs and desires of the City, the following are examples of a variety of types of non-motorized ordinances and policies.

- Include bicycle parking standards and/or storage facilities in zoning ordinance.
 

This could include a required minimum number of bicycle parking spaces based on the primary use. This could also include standards for short-term and long-term bicycle parking. Short-term parking encourages shoppers, customers, and visitors to use bicycles by providing a convenient and accessible place to park bikes. Long-term parking provides employees, students, residents, commuters, etc. a secure and weather-protected place to park bikes.
- Include non-motorized connections as a requirement of site plan review for all new developments and/or redevelopments.

This could include a requirement to grant an easement or public right-of-way if part of the non-motorized system is planned to traverse a new development.

- Incorporate or officially recognize the latest AASHTO standards as the standard for non-motorized construction within the City.
- Address provisions for trail and/or bicycle lane maintenance, regulations, and liability.
- Develop ordinance(s) instructing bicyclist and pedestrian behaviors including:
  - applicability of traffic laws to bicycles
  - obedience to traffic-control devices
  - lamps, reflectors, and helmets
  - riding on roadways and shared use paths
  - riding on sidewalks
  - right-of-way in crosswalk
  - prohibited crossings

### ROUTE / CORRIDOR IMPLEMENTATION

The Non-Motorized Transportation Network Map will serve as the long-term vision for a connected non-motorized system. Many of these routes will require additional planning, design, and funding assistance prior to coming to fruition. Utilizing the existing conditions within the City as well as an understanding of planned road work in the upcoming years, the table on the following pages was developed in order to provide a summary of data, information, as well as short- and long-term projects.

The table on the following pages (pgs 50-56) identifies whether or not it's a proposed short- (0-5 years), intermediate- (6-10 years), or long-term project. The table identifies the non-motorized route or corridor, the existing width (face of curb to face of curb), the type of system proposed, outstanding issues for further consideration, any road work that is scheduled, and whether or not it's a current bus route. It should be noted that the existing width of a corridor is likely not consistent throughout the entire length. The widths noted are simply a result of periodic field measurements taken in 2005 (not survey accurate).

Caution should be exercised when selecting non-motorized segments for implementation based only on the list of scheduled road projects. Several issues could arise especially when the resurfacing/reconstruction project provides only short segments of a planned bike lane facility. For example, if the City is planning to reconstruct 600 feet of a road in 2008 where the Master Plan indicates bike lanes are desired, then, the segment of road should be designed to accommodate bike lanes in terms of providing adequate pavement width, on-street parking (if necessary), vehicle lane markings, etc. However, it may not always be a good practice to actually mark, and sign the bike lanes. A short segment of bike lanes with little to no connections may lead to a situation where there a safety concerns, particularly where the adjoining sections are not geometrically designed to provide safe bike travel. The short section may actually attract riders which could use the geometric inadequate adjoining road sections. In situations such as the one cited above, the City should provide adequate pavement width, and stripe the vehicle lanes with consideration for future bike lanes, but not mark or sign the bike lanes until a longer segment that provides origin and destination connections is provided.

### ESTIMATED COST PER MILE FOR NON-MOTORIZED TRAIL DEVELOPMENT

Surface Material	Cost Per Mile	Longevity
Granular Stone	\$60-100K	7-10 Years
Asphalt	\$200-300K	7-15 Years
Concrete	\$300-500K	20+ Years
Boardwalk	\$1.5 -2 Million	7- 15 Years
Resin Stabilized	Varies Based On Application	7-15 Years
Wood Chips	\$65-85K	Short-term 1-3 Years

Source: "Trails for The 21<sup>st</sup> Century", Rails-to-Trails Conservancy, 2001.

### COST ESTIMATES FOR RETROFITTING EXISTING ROAD SECTIONS FOR BIKE PATHS

Paved Shoulder Per Mile 4 feet each side	\$70,000
Bike Lanes Per Mile (Added) 5 feet each side with curb and gutter	\$281,000
Wide Curb Lane Per Mile 2 feet each side	\$50,000
Painted Bike Lanes Per Mile	\$5,000 - \$30,000

Source: Adapted from Virginia Department of Transportation, 2000. PEDSAFE Manual, Wade Trim 2005.

### TYPICAL ANNUAL MAINTENANCE COSTS FOR ONE-MILE PAVED TRAIL

Drainage and storm channel maintenance	\$500
Sweeping/blowing debris off trail	\$1,200
Pick-up/removal of trash	\$1,200
Weed control and vegetation management	\$1,000
Mowing of grass shoulder	\$1,200
Minor repair to trail furniture/safety features	\$500
Maintenance supplies for work crews	\$300
Equipment fuel and repairs	\$600
<b>Total Estimated Cost Per Mile</b>	<b>\$6,500</b>

Source: "Trails for The 21<sup>st</sup> Century", Rails-to-Trails Conservancy, 2001.

### DESIGN DECISION DOCUMENT

At the time that this Master Plan was developed, the City also selected 3 corridors to further investigate for potential implementation. The 3 corridors selected for conceptual design were:

- Capital Avenue (Columbia to North)
- Emmett (Washington to Wagner)
- Van Buren (Washington to Division)

The design decision report (under separate cover) includes more detailed analysis of the potential for these three routes to become more non-motorized friendly through the implementation of bike lanes. The report includes a variety of situations and techniques to accommodate bike lanes. It's anticipated that the concept plans can also be applied to other areas of the City where the same or similar conditions may exist.

### PROBABLE COST ESTIMATES

The construction of the non-motorized system will require extensive resources. Implementation of the vision for the City of Battle Creek will take several years, however the planning of the network will be an ongoing effort. A major consideration during the planning for the implementation phase of the Master Plan is cost. Cost will undoubtedly influence the phasing of the improvements and examination into potential funding sources. This section of the Master Plan provides a summary of probable costs for implementation. The costs are derived from a variety of sources and are intended to illustrate magnitude of costs and estimates for the purpose of capital expenditure planning. The costs indicated are a starting point in planning for the cost of implementation. More detailed engineering design, analyses and site-specific design data must be collected as part of a more detailed design phase and prior to funding requests being submitted.

## ESTIMATED COSTS FOR VARIETY OF NON-MOTORIZED ELEMENTS

### Shared Use Trail

Non-Motorized Trail (10-ft wide, asphalt includes clearing & grading)	\$60	LF
Pre-Fab Pedestrian Bridge (15 ft wide, 45 ft long, steel truss)	\$70,000	EA

### Bike Lanes

Painted bicycle lanes	\$5,000-\$30,000	Mile
Painted shoulders to reduce lane width	\$1,000	Mile

### Traffic Calming

Add raised median	\$15,000-\$30,000	100 Ft
One-way to two-way conversion	\$20,000 to \$200,000	Mile
Reduce curb radius	\$2,000-\$20,000	per corner
Construct mini-roundabout	\$45,000 to \$150,000	EA
Construct mini-circle	\$6,000	EA
Modify T-intersection to reduce speeds	\$20,000 to \$60,000	EA
Install intersection median barrier	\$10,000-\$20,000	EA
Construct curb extension	\$2,000-\$20,000	per corner
Install lane choker	\$5,000-\$20,000	EA
Install speed hump	\$1,000	EA
Install pedestrian table	\$2,000-\$15,000	EA
Construct intersection diverter	\$15,000-\$45,000	EA

### Signalization and Signs

Install traffic signal	\$30,000-\$140,000	EA
Install pedestrian signal	\$20,000-\$40,000	EA
Right-Turn-On-Red Restrictions	\$200	per sign
Install pedestrian signs	\$50-\$150	per sign

### Sidewalks and Crosswalks

Concrete curb and gutter	\$15	LF
Concrete sidewalk	\$3.50	SF
ADA curb ramp w/ tactile warning	\$200-\$500	EA
Painted crosswalk, regular two lines	\$325	EA
Painted crosswalk, ladder crosswalk	\$500	EA
Patterned concrete crosswalk	\$3,000	EA

Source: Wade Trim and PEDSAFE Manual

Costs are probable estimates that can change depending on bidding climate as well as numerous field conditions. These should be used only to understand magnitude of costs. Potential projects should be reviewed by an Engineer to develop accurate cost estimates for implementation.

NON-MOTORIZED NETWORK SUMMARY TABLE

1-24-06

Corridor / Route	Existing Width <sup>(a)</sup> (Face of Curb to Face of Curb)	Proposed Non-Motorized System Type	Issues and Noted Observations	Scheduled Road Work <sup>(b)</sup>	Bus Route	Short-Term (0-5 yrs)	Intermediate (6-10 yrs)	Long-Term (10+ yrs)
194		Shared Use Trail	<ul style="list-style-type: none"> <li>Coordination with MDOT</li> <li>Grade and slope issues</li> <li>High cost alternative</li> </ul>			X		X
2 Mile		Route Signage south of Beckley	<ul style="list-style-type: none"> <li>Narrow roadway</li> <li>No paved shoulder</li> <li>Low traffic volumes</li> </ul>			X		
24 <sup>th</sup> Street	32'	Route Signage	<ul style="list-style-type: none"> <li>On-street parking</li> <li>Narrow right-of-way</li> </ul>			X		
28 <sup>th</sup> Street	22' - 32'	<ul style="list-style-type: none"> <li>Route Signage north of Columbia</li> <li>Shared Use Trail at High School and South to Westlake</li> </ul>	<ul style="list-style-type: none"> <li>On-street parking</li> </ul>	<ul style="list-style-type: none"> <li>2007 Pavement Replacement Columbia to Territorial</li> </ul>	X	X		
Angell	45' at bridge	Bike Lanes	<ul style="list-style-type: none"> <li>On-street parking</li> <li>Easy to implement short segments</li> </ul>				X	
Beckley	22' - 24' west of Helmer 46' west of Capital	Route Signage west of Helmer	<ul style="list-style-type: none"> <li>Narrow roadway with no paved shoulders west of Helmer.</li> <li>Not sufficient width for bike lanes and high traffic volumes east of Helmer.</li> </ul>	<ul style="list-style-type: none"> <li>2009 Resurface Helmer to Minges</li> <li>2009 Resurface Minges to Capital</li> </ul>	X	X		
Bedford		Shared Use Trail			X		X	
Burnham	24' at bridge	Bike Lanes over bridge	<ul style="list-style-type: none"> <li>Width</li> </ul>	<ul style="list-style-type: none"> <li>2008 Resurface Meachem to East End</li> </ul>			X	
Capital	36' - 56'	Bike Lanes	<ul style="list-style-type: none"> <li>MDOT jurisdiction on NE section</li> <li>Significant reduction in vehicle level of service at major intersections.</li> <li>Requires reduction of vehicular travel lanes.</li> <li>Easy implementation south of Columbia.</li> </ul>	<ul style="list-style-type: none"> <li>2008 Resurface Fountain to Territorial</li> <li>2010 Resurface Weeks to Rebecca</li> </ul>	X	X		

(a) Width may not be consistent throughout entire corridor. Existing widths represent periodic field measurements only.

(b) Assumes resurfacing and reconstruction projects will trigger non-motorized improvements.

## NON-MOTORIZED NETWORK SUMMARY TABLE

1-24-06

Corridor / Route	Existing Width <sup>(a)</sup> (Face of Curb to Face of Curb)	Proposed Non-Motorized System Type	Issues and Noted Observations	Scheduled Road Work <sup>(b)</sup>	Bus Route	Short-Term (0-5 yrs)	Intermediate (6-10 yrs)	Long-Term (10+ yrs)
<b>Cliff</b>	31'	Bike Lanes	<ul style="list-style-type: none"> <li>On-street parking</li> <li>Consider implementation in 2006 following resurfacing.</li> </ul>	<ul style="list-style-type: none"> <li>2006 Resurface</li> <li>2006 Reconstruct Caine to James</li> </ul>	X	X		
<b>College</b>		Route Signage	<ul style="list-style-type: none"> <li>West of North Avenue, South of Emmett.</li> <li>Alternative to reducing number of travel lanes on North Avenue south of Emmett.</li> </ul>			X		
<b>Columbia</b>	7' - 8' paved shoulder	Paved Shoulder west of Helmer	<ul style="list-style-type: none"> <li>Easy implementation</li> </ul>		X	X		
<b>Dickman</b>	62'	<ul style="list-style-type: none"> <li>Shared Use Trail between Goguac and Capital</li> <li>Shared Use Trail east of Battle Creek River</li> </ul>	<ul style="list-style-type: none"> <li>Median west of Kendall</li> <li>MDOT coordination</li> </ul>	<ul style="list-style-type: none"> <li>Reconstruct South Ave to Elm</li> </ul>	X		X	
<b>East</b>	30' - 34'	<ul style="list-style-type: none"> <li>Route Signage btwn Wagner &amp; Capital</li> <li>Bike Lanes north of Capital</li> </ul>	<ul style="list-style-type: none"> <li>On-street parking</li> <li>Implement after resurfacing in 2006.</li> </ul>	<ul style="list-style-type: none"> <li>2006 Resurface Capital to Emmett</li> </ul>	X	X		
<b>Elm</b>	31' - 42'	Bike Lanes installed in 2005 as pilot project	<ul style="list-style-type: none"> <li>Bicycle-safe drain grates needed on bridge when deck is replaced.</li> <li>Remark lanes after resurfacing in 2006.</li> </ul>	<ul style="list-style-type: none"> <li>2006 Resurface Capital to Van Buren</li> </ul>		X		
<b>Emmett</b>	29' - 42'	Bike Lanes	<ul style="list-style-type: none"> <li>On-street parking</li> <li>Some geometric issues</li> <li>Construction of refuge islands at Clinton/Orchard and Woodmarin/Chestnut where existing intersection geometry is not conducive for pedestrian, cyclists, or motorists.</li> </ul>	<ul style="list-style-type: none"> <li>2006 Resurface North to McKinley</li> <li>2006 Resurface North to Hanover</li> <li>2007 Reconstruct Hanover to Washington</li> <li>2008 Reconstruct McKinley to East</li> </ul>	X	X		

(a) Width may not be consistent throughout entire corridor. Existing widths represent periodic field measurements only.

(b) Assumes resurfacing and reconstruction projects will trigger non-motorized improvements.

NON-MOTORIZED NETWORK SUMMARY TABLE

1-24-06

Corridor / Route	Existing Width <sup>(a)</sup> (Face of Curb to Face of Curb)	Proposed Non-Motorized System Type	Issues and Noted Observations	Scheduled Road Work <sup>(b)</sup>	Bus Route	Short-Term (0-5 yrs)	Intermediate (6-10 yrs)	Long-Term (10+ yrs)
<b>Gethings</b>	20' – 22'	<ul style="list-style-type: none"> <li>Shared Use Trail segment to connect into Woodland Park</li> <li>Bike Lanes from Helmer to Stone Jug.</li> </ul>	<ul style="list-style-type: none"> <li>No paved shoulders</li> <li>Rolling terrain</li> <li>Limited sight distance</li> <li>Requires road widening</li> <li>Correct deficient vertical alignment</li> </ul>					X
<b>Glen Cross</b>		Shared Use Trail to connect existing trail to M-66					X	
<b>Gogovac</b>		Bike Lanes btwn Helmer and Riverside	<ul style="list-style-type: none"> <li>Sight distance issues</li> <li>On-street parking</li> </ul>				X	
<b>Golden</b>	30' – 34'	Paved Shoulders from Capital east to City limits					X	
<b>Goodale</b>	24' - 36'	Bike Lanes	<ul style="list-style-type: none"> <li>Gravel shoulders</li> <li>Runs parallel to Linear Park</li> </ul>	<ul style="list-style-type: none"> <li>2007 Reconstruct Washington to 200' East</li> <li>2008 Resurface 200' East of Washington to North Ave.</li> <li>2008 Resurface Washington to 200' East</li> </ul>	X			

(a) Width may not be consistent throughout entire corridor. Existing widths represent periodic field measurements only.  
 (b) Assumes resurfacing and reconstruction projects will trigger non-motorized improvements.

## NON-MOTORIZED NETWORK SUMMARY TABLE

1-24-06

Corridor / Route	Existing Width <sup>(a)</sup> (Face of Curb to Face of Curb)	Proposed Non-Motorized System Type	Issues and Noted Observations	Scheduled Road Work <sup>(b)</sup>	Bus Route	Short-Term (0-5 yrs)	Intermediate (6-10 yrs)	Long-Term (10+ yrs)
<b>Helmer</b>	38' - 60'	<ul style="list-style-type: none"> <li>▪ Bike Lanes installed in 2005 as pilot project from Beckley to south of Columbia</li> <li>▪ Route Signage south of Beckley</li> <li>▪ Shared Use Trail north of Columbia</li> </ul>	<ul style="list-style-type: none"> <li>▪ When intersections along Helmer are reconstructed or resurfaced, vehicular lane widths should be reduced and marked bicycle lanes extended.</li> <li>▪ Existing I-94 bridge is too narrow to support bicycle lanes and sight visibility is limited. When MDOT reconstructs bridge, new structure should be widened to support on-road bicycle lanes as well as pedestrian walkways.</li> </ul>			X		
<b>Hill-Brady Hubbard</b>	31' - 35'	<ul style="list-style-type: none"> <li>Shared Use Trail</li> <li>Bike Lanes from Van Buren to Goodale</li> </ul>	<ul style="list-style-type: none"> <li>▪ Coordination with property owners.</li> <li>▪ On-street parking</li> </ul>		X		X	
<b>Kendall</b>	43'	Bike Lanes	<ul style="list-style-type: none"> <li>▪ Consider implementation after 2009 resurfacing project.</li> </ul>	<ul style="list-style-type: none"> <li>▪ 2009 Resurface Parkway to Goodale</li> </ul>		X		
<b>LaVista</b>	20'	Bike Lanes	<ul style="list-style-type: none"> <li>▪ Grass median</li> <li>▪ On-street parking</li> <li>▪ Residential area; consider 7' parking lane, 4' bike lane, and 9' travel lane.</li> </ul>	<ul style="list-style-type: none"> <li>▪ 2006 Resurface Goguac to Columbia</li> </ul>		X		
<b>Limit</b>	33'	Bike Lanes	<ul style="list-style-type: none"> <li>▪ On-street parking</li> </ul>				X	
<b>M-66</b>		Shared Use Trail	<ul style="list-style-type: none"> <li>▪ MDOT Coordination</li> </ul>			X		
<b>Main</b>	38' - 57'	<ul style="list-style-type: none"> <li>▪ Bike Lanes from Columbia to Divison</li> <li>▪ Route Signage from Divison to Capital</li> </ul>	<ul style="list-style-type: none"> <li>▪ Railroad crossing</li> <li>▪ Coordination with County Road Commission south of City limits</li> <li>▪ On-street parking</li> <li>▪ Brick street downtown</li> </ul>		X			

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(b) Assumes resurfacing and reconstruction projects will trigger non-motorized improvements.

NON-MOTORIZED NETWORK SUMMARY TABLE

1-24-06

Corridor / Route	Existing Width <sup>(a)</sup> (Face of Curb to Face of Curb)	Proposed Non-Motorized System Type	Issues and Noted Observations	Scheduled Road Work <sup>(b)</sup>	Bus Route	Short-Term (0-5 yrs)	Intermediate (6-10 yrs)	Long-Term (10+ yrs)
<b>Meadow</b>	31'	Bike Lanes from Riverside to Capital SW	<ul style="list-style-type: none"> <li>2009 Resurface Capital to Westfield</li> </ul>	<ul style="list-style-type: none"> <li>2009 Resurface Capital to Westfield</li> </ul>		X		
<b>Michigan</b>		<ul style="list-style-type: none"> <li>Bike Lanes from east of RR tracks east to City limit</li> <li>Shared Use Trail to Elm</li> </ul>	<ul style="list-style-type: none"> <li>MDOT Coordination</li> <li>Best to implement after resurfacing project.</li> </ul>				X	
<b>Minges</b>	22'	<ul style="list-style-type: none"> <li>Bike Lanes on W. Minges</li> <li>Shared Use Trail on E. Minges</li> </ul>	<ul style="list-style-type: none"> <li>Narrow shoulders</li> <li>Sharp horizontal and vertical curves</li> <li>Shared Use Trail to connect Capital, Minges Brook Park, and Riverside.</li> </ul>	<ul style="list-style-type: none"> <li>2009 Resurface Beckley to North End</li> </ul>		X		
<b>North</b>	39' - 42'	Bike Lanes north of Emmett	<ul style="list-style-type: none"> <li>South of Emmett would require lane reduction to accommodate bike lanes.</li> </ul>		X			
<b>Riverside</b>	22' - 38'	Bike Lanes	<ul style="list-style-type: none"> <li>Elevated boardwalk or bridge necessary due to slopes/drains.</li> <li>Widen road as necessary to provide bike lanes.</li> </ul>	<ul style="list-style-type: none"> <li>2007 Pavement Replacement Columbia to Minges</li> <li>2008 Pavement Replacement Minges to Beckley.</li> <li>2008 Resurface Garrison to East</li> </ul>		X		
<b>Roosevelt</b>		Bike Lanes	<ul style="list-style-type: none"> <li>Coordination with CCRC east of East</li> </ul>			X		
<b>Skyline</b>	7' - 9' paved shoulder	Paved Shoulder	<ul style="list-style-type: none"> <li>Coordination with MDOT</li> <li>Difficult intersection at Columbia</li> </ul>		X			
<b>Stone Jug</b>	22'	Bike Lanes from Watkins to Columbia	<ul style="list-style-type: none"> <li>No shoulder</li> <li>Rolling terrain</li> <li>Limited sight distance</li> <li>Requires road widening</li> </ul>					X

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## NON-MOTORIZED NETWORK SUMMARY TABLE

1-24-06

Corridor / Route	Existing Width <sup>(a)</sup> (Face of Curb to Face of Curb)	Proposed Non-Motorized System Type	Issues and Noted Observations	Scheduled Road Work <sup>(b)</sup>	Bus Route	Short-Term (0-5 yrs)	Intermediate (6-10 yrs)	Long-Term (10+ yrs)
<b>Territorial</b>	31' – 38'	Bike Lanes	<ul style="list-style-type: none"> <li>▪ On-street parking</li> </ul>	<ul style="list-style-type: none"> <li>▪ 2007 Resurface Capital to Riverside</li> <li>▪ 2010 Resurface South Airport Rd to End</li> <li>▪ 2011 Resurface Helmer to 20<sup>th</sup></li> </ul>	X	X		
<b>Upton</b>		Bike Lanes	<ul style="list-style-type: none"> <li>▪ On-street parking</li> </ul>	<ul style="list-style-type: none"> <li>▪ 2009 Resurface Kedzie to Fountain</li> </ul>		X		
<b>Van Buren</b>	30' – 39'	Bike Lanes	<ul style="list-style-type: none"> <li>▪ On-street parking</li> <li>▪ Bike lanes adjacent to angle parking is not recommended. Change to parallel parking.</li> </ul>		X	X		
<b>Washington</b>		<ul style="list-style-type: none"> <li>▪ Bike Lanes south of Goodale</li> <li>▪ Paved Shoulder north of Goodale</li> <li>▪ Shared Use Trail across Kalamazoo River Bridge</li> </ul>		<ul style="list-style-type: none"> <li>▪ 2006 Reconstruct Michigan to Orin</li> <li>▪ 2007 Reconstruct 200' S of Goodale to Orin</li> </ul>	X	X		
<b>Watkins</b>	21' – 22'	Bike Lanes	<ul style="list-style-type: none"> <li>▪ Narrow shoulders</li> <li>▪ Rolling terrain</li> <li>▪ Will need additional pavement width to provide Bike Lanes in future</li> </ul>				X	

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NON-MOTORIZED NETWORK SUMMARY TABLE

1-24-06

Corridor / Route	Existing Width <sup>(a)</sup> (Face of Curb to Face of Curb)	Proposed Non-Motorized System Type	Issues and Noted Observations	Scheduled Road Work <sup>(b)</sup>	Bus Route	Short-Term (0-5 yrs)	Intermediate (6-10 yrs)	Long-Term (10+ yrs)
<b>NON-MOTORIZED SYSTEMS NOT ASSOCIATED WITH RIGHT-OF-WAY</b>								
Bailey Park Extension		Shared Use Trail extension north along river					X	
Fell Park to Stringham		Shared Use Trail along Willard, Spaulding, Bedford, Woodlawn, and Stringham	<ul style="list-style-type: none"> <li>Provide connections between Fell Park, Urbandale and LaMora Schools, and the existing Linear Park system along the river.</li> </ul>				X	
Abandoned Rail Corridor Helmer to Full Blast		Shared Use Trail	<ul style="list-style-type: none"> <li>Utilize abandoned railroad corridor to construct trail connection between Helmer and Full Blast.</li> <li>Continuity of remaining rail corridor and ownership will need investigation.</li> </ul>				X	
194 to Linear Park Connection		Shared Use Trail	<ul style="list-style-type: none"> <li>Extend trail east along E. Dickman , near rail corridor, crossing Main, Elm, and Michigan then north to connect to existing Linear Park.</li> </ul>					X
Lakeview High School to Westlake Park		Shared Use Trail	<ul style="list-style-type: none"> <li>Provide loop and connections between high school, middle school, and Westlake Park.</li> <li>Coordination with school district and safe-routes-to-school program.</li> </ul>			X		

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Corridor / Route	Existing Width <sup>(a)</sup> (Face of Curb to Face of Curb)	Proposed Non-Motorized System Type	Issues and Noted Observations	Scheduled Road Work <sup>(b)</sup>	Bus Route	Short-Term (0-5 yrs)	Intermediate (6-10 yrs)	Long-Term (10+ yrs)
Woodland Park		Shared Use Trail	<ul style="list-style-type: none"> <li>System within Woodland Park and connection to Gethings and Helmer Roads.</li> </ul>			X		
Riverside to 194 Connection		Shared Use Trail	<ul style="list-style-type: none"> <li>Connection between Riverside Drive and 194 north of Beachfield Dr. and south of Briar Hill Dr.</li> </ul>					X
Southeast Connection between Helmer and Capital		Shared Use Trail	<ul style="list-style-type: none"> <li>Extensive private property.</li> </ul>					X
Binder Park Zoo Connection		Shared Use Trail	<ul style="list-style-type: none"> <li>Connection between M-66 and Binder Park Zoo.</li> <li>Within City property as much as possible along north side of Zoo.</li> <li>Provide connection to Beadle Lake Road at/near entry to Zoo.</li> </ul>					X

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## POTENTIAL FUNDING OPPORTUNITIES

Potential funding sources from outside entities for non-motorized planning, design and construction change and evolve on a regular basis. Understanding available funding programs, their requirements and deadlines requires *continuous* monitoring. A few of the more common funding sources have been detailed here as a reference and resource. These are in addition to traditional funding methods such as the general fund, millages, bonds, DDA's, etc.

### TRANSPORTATION ENHANCEMENT FUNDS (MDOT)

Transportation Enhancements (TE) activities are federally funded, community-based projects that expand travel choices and enhance the transportation experience by improving the cultural, historic, aesthetic and environmental aspects of the transportation infrastructure. To be eligible, a project must fall into one of the 12 TE activities and relate to surface transportation. Activities that relate to the implementation of this Master Plan include:

- *Provision of facilities for pedestrians and bicycles.*  
Includes new or reconstructed sidewalks, walkways, curb ramps, bike lane striping, wide paved shoulders, bike parking, bus racks, off-road trails, bike and pedestrian bridges and underpasses.
  - Paved shoulders four or more feet wide
  - Curb lane width greater than 12 feet
  - Bike lanes
  - Pedestrian crosswalks, sidewalks
  - Shared use paths 10 feet wide or greater
  - Path/trail user amenities
  - Grade separations
  - Bicycle parking facilities
  - Bicycle accommodations on public transportation
- *Provision of safety and educational activities for pedestrians and bicyclists.*  
Programs designed to encourage walking and bicycling by providing potential users with education and safety instruction through classes, pamphlets and signage.
- *Preservation of abandoned railway corridors (including the conversion and use thereof for pedestrian and bicycle trails).*  
Acquiring railroad rights-of-way; planning, designing and constructing multi-use trails; developing rail-with-trail projects; purchasing unused railroad property for reuse.

A minimum 20% local match is required for proposed projects and applications are accepted on an on-going basis.

### MICHIGAN NATURAL RESOURCES TRUST FUND

The MNRTF provides funding for both the purchase of land (or interests in land) for recreation or protection of land because of its environmental importance or scenic beauty and the appropriate development of land for public outdoor recreation use. Goals of the program are to: 1) protect Michigan's natural resources and provide for their access, public use and enjoyment; 2) provide public access to Michigan's water bodies, particularly the Great Lakes, and facilitate their recreation use; 3) meet regional, county and community needs for outdoor

recreation opportunities; 4) improve the opportunities for outdoor recreation in Michigan's urban areas; and, 5) stimulate Michigan's economy through recreation-related tourism and community revitalization.

Any individual, group, organization, or unit of government may submit a land acquisition proposal. However, only state and local units of government can submit development proposals. All proposals for grants must include a local match of at least 25% of the total project cost. An updated Parks and Recreation Master Plan must be on file with the MDNR prior to application. There is no minimum or maximum for acquisition projects. For development projects, the minimum funding request is \$15,000 and the maximum is \$500,000. Applications are due in April and August for acquisition projects and April for development projects. Potential revisions to the Trust Fund Goals and Evaluation Criteria are currently being discussed at the state level.

### LAND AND WATER CONSERVATION FUND

The Land and Water Conservation Fund (LWCF) is a federal appropriation to the National Park Service who distributes funds to the Michigan Department of Natural Resources for land acquisition and development of outdoor recreation facilities. Due to limited funds within this program, the MDNR has focused funding on outdoor development projects. Applications are due in April and the LWCF program requires a 50% local match. The LWCF program utilizes the same application as the MNRTF program.

### DALMAC FUND

Established in 1975 to promote bicycling in Michigan, the DALMAC Fund is administered by the Tri-County Bicycle Association and supported by proceeds from DALMAC. The DALMAC Fund supports safety and education programs, bicycle trail development, state-wide bicycle organizations, and route mapping projects. Applications must be submitted between January 1st and March 15th. They are reviewed by the DALMAC Fund Committee and approved by the Board. Grants are made between June and August of the year they were submitted. Applications can be found at [www.biketcba.org](http://www.biketcba.org).

### KODAK AMERICAN GREENWAYS AWARDS

Kodak, The Conservation Fund, and the National Geographic Society, provide small grants to stimulate the planning and design of greenways in communities throughout America. The annual grants program was instituted in response to the President's Commission on Americans Outdoors recommendation to establish a national network of greenways. Made possible by a grant from Eastman Kodak, the program also honors groups and individuals whose ingenuity and creativity foster the creation of greenways. The application period typically runs from March 1st through June 1st. Program goals are to: develop new, action-oriented greenways projects; assist grassroots greenway organizations; leverage additional money for conservation and greenway development; and, recognize and encourage greenway proponents and organizations. Maximum grant is \$2,500, however, most grants range from \$500 to \$1,500. For more information go to [www.conservationfund.org](http://www.conservationfund.org).

### COOL CITIES PROGRAM

The Governor's Cool Cities Initiative is about reinventing Michigan's cities to be attractive places to live for an increasingly diverse group of residents. The program combines more than 100 of the state's community improvement grants, tax credits, loans and assistance programs into a single resource toolbox that can be used by cities and communities for revitalization projects. In 2005, the City of Battle Creek was selected as a Cool Cities "Neighborhoods in Progress". This designation gives the City priority access to existing state grant funds, loans, tax credits, or services that can help create vibrant, mixed-use neighborhoods. The City received a catalyst grant of \$100,000. For more information go to [www.coolcities.com](http://www.coolcities.com).

### BIKES BELONG

The Bikes Belong Coalition is sponsored by members of the American Bicycle Industry. Their mission is to put more people on bikes more often. The program funds projects in three categories:

- Facility
- Education
- Capacity Building

Requests for funding can be up to \$10,000 for projects such as bike paths, trails, lanes, parking, and transit, and safe routes to school. Applications are reviewed on a quarterly basis. More information can be found at [www.bikesbelong.org](http://www.bikesbelong.org).

### CONGESTION MITIGATION AND AIR QUALITY IMPROVEMENT PROGRAM (CMAQ)

The CMAQ program was created to reduce congestion on local streets and improve air quality. Funds are available to urban communities designated as "non-attainment" areas for air quality. Pedestrian and bicycle projects are eligible for CMAQ funding. See [www.fhwa.dot.gov/environment/cmaqpgs/index.htm](http://www.fhwa.dot.gov/environment/cmaqpgs/index.htm).

### SAFE ROUTES TO SCHOOL PROGRAM

The Safe Routes To School Program is a national movement to make it safe, convenient and fun for children to bicycle and walk to school. When routes are safe, walking or biking to and from school is an easy way to get the regular physical activity children need to succeed. In Michigan, the program is sponsored by the Michigan Governor's Council on Physical Fitness and has gained momentum over the past few years. With the passage of the federal transportation legislation in 2005, Michigan's SR2S program will make schools eligible for transportation enhancement funds, providing for infrastructure improvements and education campaigns. The purpose of the program as defined in the federal legislation is:

- (1) to enable and encourage children, including those with disabilities, to walk and bicycle to school;
- (2) to make bicycling and walking to school a safer and more appealing transportation alternative, thereby encouraging a healthy and active lifestyle from an early age; and
- (3) to facilitate the planning, development, and implementation of projects and activities that will improve safety and reduce traffic, fuel consumption, and air pollution in the vicinity of schools.

The program authorizes \$612 million over the 5 fiscal years beginning with 2005. The Michigan Department of Transportation estimates that Michigan's total apportionment over the 5 years will be roughly \$19 million.

### WK KELLOGG FOUNDATION

The Kellogg Foundation helps people help themselves through the practical application of knowledge and resources to improve their quality of life and that of future generations. It is a non-profit organization whose mission is to apply knowledge to solve the problems of people. Grants from the foundation are made in four areas: Health, Food Systems and Rural Development, Youth and Education, and Philanthropy and Volunteerism. With its roots and location in Battle Creek, the foundation has supported numerous programs, activities, projects, and events in the Greater Battle Creek area.

### BATTLE CREEK COMMUNITY FOUNDATION

The mission of the Battle Creek Community Foundation is to "promote giving, build endowment, and provide leadership to improve quality of life." It aims to improve the quality of life within the community, both today and in the future. The Foundation serves as an umbrella agency for several funds and grant programs including the Guido A. and Elizabeth H. Binda Educational Fund. Awards from the Binda Fund support a broad range of education issues. The Foundation makes grants to non-profit organizations located in or directly affecting residents in Calhoun County, and specifically, Battle Creek. Average grant awards are between \$5,000 and \$10,000.

### THE MILLER FOUNDATION

The Miller Foundation helps make things happen in the Battle Creek area. Since 1963, the Foundation has awarded over \$17,000,000 to assist in making Battle Creek a better place to live. The Foundation focuses on assisting local non-profit, charitable organizations and governmental agencies with projects that provide for economic development, neighborhood improvement, improving educational outcomes for youth and eliminating barriers to employment for all in Battle Creek and the surrounding area. Funding applications must be received by the first day of the month in January, March, May, July, September, or November.





#### 4 E's OF NON-MOTORIZED SUCCESS

##### **Engineering**

The system must be well-designed and constructed. An adequate bicycle or pedestrian system is one that allows users with varying abilities to safely and efficiently travel from origin to destination.

##### **Education**

A safety and education campaign is one of the most important elements in reducing bicyclist and pedestrian injuries, reducing hostility between various modes of transportation, and ensuring that the law is obeyed.

##### **Enforcement**

Enforcement is closely correlated to safety and education. Education will not be effective if there is inadequate enforcement by the local law agencies to back it up. Cyclists and pedestrians should be ticketed for traffic offenses the same as motorists.

##### **Encouragement**

Walking and cycling can be encouraged by providing the means for an enjoyable experience. This includes well-designed and maintained facilities, adequate bike parking, as well as organized events throughout the year.

Designing and constructing non-motorized systems, whether on- or off-road, is a process complicated by existing conditions, public opinion, and financing. Some non-motorized projects can be as complicated, time consuming, and expensive as building roads. There are a number of agencies, groups, and departments that will need to remain involved in further planning and design prior to implementation. The following pages provide guidance and example cross-sections for typical non-motorized sections and situations within the City of Battle Creek. These are intended as guidelines only, although they are based on standards established by the American Association of State Highway and Transportation Officials (AASHTO), and other state agencies and non-motorized organizations. All mandated standards (outside of this document) that are required for construction, should be referenced at the time of design as they often change and are updated.

Regardless of where a non-motorized system is built or who it is built by, users should expect a safe, user-friendly, and accessible system.

There are a variety of environments, situations, and conditions within the City of Battle Creek. Each of the potential connections will require detailed analysis and design prior to construction in order to safely accommodate non-motorized transportation. There are a variety of factors that affect pedestrians and bicyclists, all of which must be considered when selecting the appropriate design configuration.

#### FACTORS THAT AFFECT PEDESTRIANS

- Presence of a sidewalk/trail
- Separation of pedestrians and motorized vehicles
- Lateral separation of pedestrians and motorized vehicles
- Presence of physical barriers and buffers (including parking) between automobiles and pedestrians
- Motorized vehicle volume
- Motorized vehicle speed

#### FACTORS THAT AFFECT BICYCLISTS

- Presence of bicycle lane or paved shoulder
- Proximity of bicyclists to motorized vehicles
- Motorized vehicle volume
- Motorized vehicle speed
- Motorized vehicle type (percent truck/commercial traffic)
- Pavement condition
- Percent on-street parking
- Sight distance
- Number of intersections

It is also important to understand that there are three primary types of bicyclists: Advanced Bicyclists (Type A), Basic Bicyclists (Type B), and Children (Type C). These are described in greater detail below.

#### • **Advanced Bicyclists (Type A)**

- Experienced riders who can operate under most traffic conditions. They are best served by:
- Direct access to destinations usually via the existing street system
  - Opportunity to operate at maximum speed with minimum delays
  - Sufficient operating space on the road or shoulder to reduce the need for either the bicyclist or the motor vehicle operator to change position when passing.

#### • **Basic Bicyclists (Type B)**

- Casual or new adult and teenage riders who are less confident of their ability to operate in traffic without special provisions. They are best served by:
- Comfortable access to destinations, using either low-speed, low traffic-volume streets, or designated facilities.
  - Well-defined separation of bicycles and motor vehicles on arterial and collector streets (bike lanes or shoulders) or separate bike paths

#### • **Children (Type C)**

- Pre-teen riders whose roadway use is initially monitored by parents. Best served by:
- Access to key destinations surrounding residential areas, including schools, recreation areas, shopping, other neighborhoods.
  - Residential streets with low motor vehicle speed limits and volumes
  - Well-defined separation of bicycles and motor vehicles on arterial and collector streets or separate bike paths.

### GENERAL DESIGN GUIDELINES

Nearly every design guideline has exceptions, necessitated by local conditions, community desire, changing trends, intensity of use, and many other factors. However, design guidelines offer an easy-to-use summary of extensive design expertise that allows for flexibility in dealing with site specific issues without the rigid process associated with mandated standards.<sup>1</sup>

Typical guidelines that are most likely to apply to situations within the City of Battle Creek have been extracted from a variety of references and are provided for the convenience of City staff to further implement the Master Plan.

#### SHARED USE TRAIL

In Battle Creek, shared use trails are off-road facilities with minimal cross flow by motor vehicles, such as the Linear Park system. Users may include bicyclists, in-line skaters, roller skaters, wheelchair users and pedestrians. These facilities are designed for two-way travel and serve a variety of purposes. Shared use trails can be located along rivers, creeks, railroad and utility rights-of-way, limited access freeways, within parks, etc.

Paths shared by pedestrians and bicyclists need to be designed in accordance with AASHTO design requirements. In particular, the following design considerations should be used in planning for a shared-use facility.

- Horizontal and vertical alignment to ensure clear sight lines.
- Wide shoulders, two feet minimum on each side, to provide stopping and resting areas and allow for passing and widening at curves.
- Avoid view obstructions at edges of the trail by placing signs, poles, utility boxes, waste receptacles, trenches and other elements away from the edge of the path and using low-growing shrubs and groundcovers or high-branching trees.
- Use bicycle speed limits.
- Use delineation and separation treatments such as colored paving, textured paving, pavement markings, and signing.
- Use directional signing.

<sup>1</sup> Iowa Trails 2000: Design Guidelines

- It is recommended to sign and mark a four-inch wide solid yellow line at the center of the path as well as edge lines when curves with restricted sight distances are experienced.

The minimum width of a shared path is 10 feet and a 12-foot minimum is desirable in more heavily-used sections. The vertical clearance to obstructions should be a minimum of 8 feet, however, vertical clearance may need to be greater to permit passage of maintenance and emergency vehicles. In undercrossings and tunnels, 10-feet of vertical clearance is desirable.

The renderings below illustrate how a shared use trail could be accommodated along Hill-Brady within the Fort Custer Industrial Park.



HILL-BRADY (FORT CUSTER INDUSTRIAL PARK)

Sidewalks are generally inappropriate for use by adults (on bikes) because they put the adult bicyclist in conflict with motorists using driveways, and with pedestrians, utility poles and signposts. Also, the cyclist is generally not visible or noticed by the motorist so that the cyclist suddenly emerges at intersections, surprising the motorist and creating a hazardous condition.<sup>2</sup>



<sup>2</sup> Guide for the Development of Bicycle Facilities. 1999. AASHTO.

## BIKE LANE

Bike lanes can be utilized when it is desirable to delineate available road space for preferential use by bicyclists and motorists, and to provide for more predictable movements by each. As is detailed in the AASHTO standards, bike lane markings can increase a bicyclist's confidence in motorists not straying into their path of travel. Likewise, passing motorists are less likely to swerve to the left out of their lane to avoid bicyclists on their right.

Bike lanes should be one-way facilities and carry bike traffic in the same direction as adjacent motor vehicle traffic.

If parking is permitted, the bike lane should be placed between the parking area and the travel lane and have a minimum width of 5 feet. In no instance should a bike lane be placed between the parking lane and curb.

The recommended width of a bike lane is 5 feet from the face of a curb to the bike lane stripe. Five feet should be sufficient in cases where a 1-2 foot wide concrete gutter pan exists, given that a minimum of 3 feet of rideable surface is provided. In general, on-road bike lanes greater than 6-feet wide should be avoided as they tend to be used as vehicle lanes.

A bike lane should be delineated from the motor vehicle travel lanes with a 6-inch solid white line. An additional 4-inch solid white line can be placed between the parking lane and the bike lane. This second line will encourage parking closer to the curb, providing added separation from motor vehicles, and where parking turnover or usage is light, can discourage motorists from using the bike lane as a through travel lane.

Bike lane striping should not be installed across any pedestrian crosswalks, or railroad crossings, and, in most cases, should not continue through any street intersections.

At signalized or stop-controlled intersections with right-turning motor vehicles, the solid bike lane striping to the approach should be replaced with a broken line. The length of the broken line section is usually 50 to 200 feet.

If there is a bus stop or high right-turn volume, the 6-inch solid white line should be replaced with a broken line for the length of the bus stop.

Bike lanes sometimes complicate bicycle and motor vehicle turning movements at intersections. Because they encourage bicyclists to keep to the right and motorists to keep to the left, both operators are somewhat discouraged from merging in advance of turns. At intersections, bicyclists proceeding straight through and motorists turning right must cross paths. Striping and signing configurations that encourage crossings in advance of the intersection, in a merging fashion, are preferable to those that force the crossing in the immediate vicinity of the intersection. In cases where throat widening has reduced the available pavement width below the minimum requirements for bike lanes, and it is not possible to widen the pavement, the bike lane striping should be discontinued and regulatory signs (W11-1 and W16-1 Share the Road) should be installed. Bicyclists

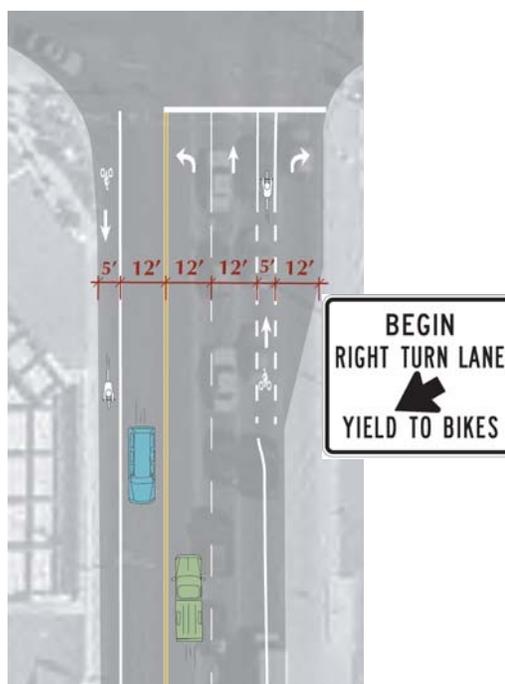
proceeding straight through the intersection should merge with motor vehicle traffic to cross the intersection.

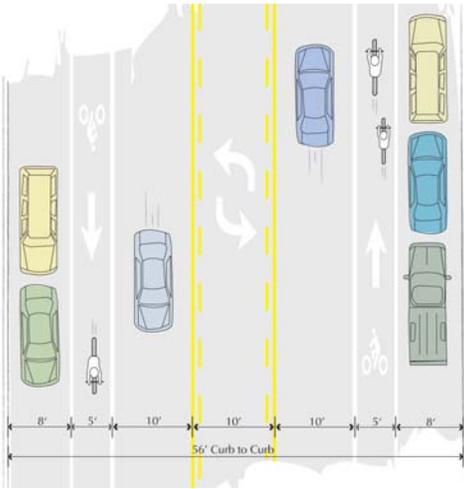
A bike lane should be painted with standard pavement symbols to inform bicyclists and motorists of the presence of the bike lane. The standard pavement symbols are a bicycle symbol and a directional arrow (white and reflectorized). (See page 9C-8 of the 2005 MMUTCD)

Additional elements to keep in mind:

- At major intersections, and minor intersections where there are breaks in the centerline marking, provide a corresponding break in the bicycle lane marking. The begin and end points of the centerline and bike lane typically correspond with the end of the curb return at the intersection.
- Place the directional arrow and rider symbol at begin and end sections of the bike lane, at major intersections, or otherwise at approximately 750-foot spacings.
- Provide R3-17 Bike Lane signs at the beginning and end sections of the bike lane, and approximately every 0.25-mile spacings. The R3-17 signs should be located at or near the arrow and rider symbols.

The illustrations on the following page depict a variety of options for accommodating on-road bicycle lanes with varying curb-to-curb widths. These are provided as examples and illustrate the ability to maintain on-street parking, to provide center turn lanes, to reduce widths of vehicular travel lanes, etc. Some roads can accommodate bike lanes with the addition of striping and traffic signs, while others require pavement widening and/or reconstruction.

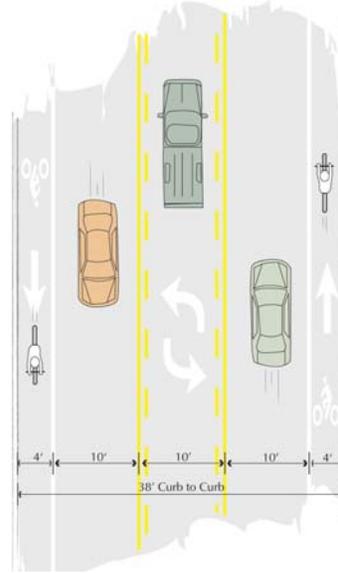




**56' Wide Curb to Curb**

**Alternative 1:**

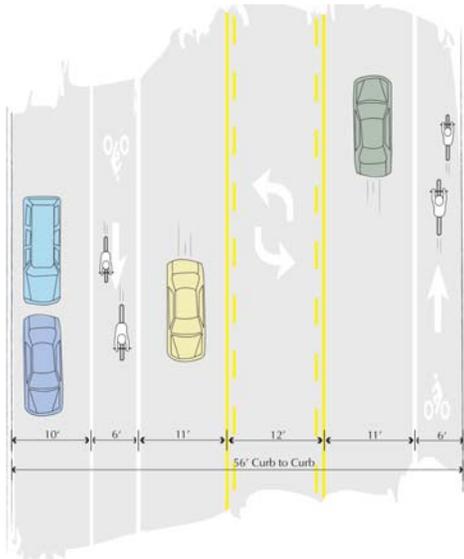
- Parking Both Sides
- (2) 10' Travel Lanes
- 10' Center Lane
- 5' Bike Lanes
- Speed Limit 35 mph or less
- Low truck volumes



**38' Wide Curb to Curb**

**Alternative 1:**

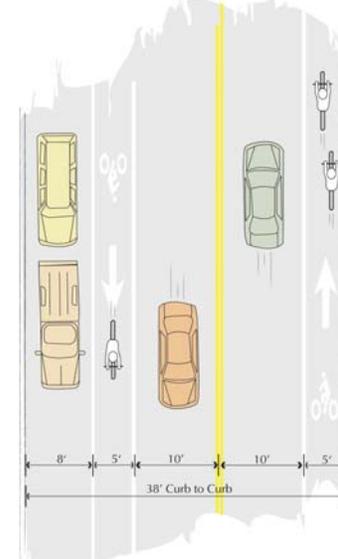
- No Parking
- (2) 10' Travel Lanes
- 10' Center Lane
- 4' Bike Lanes
- Speed Limit 35 mph or less
- Low truck volumes



**56' Wide Curb to Curb**

**Alternative 2:**

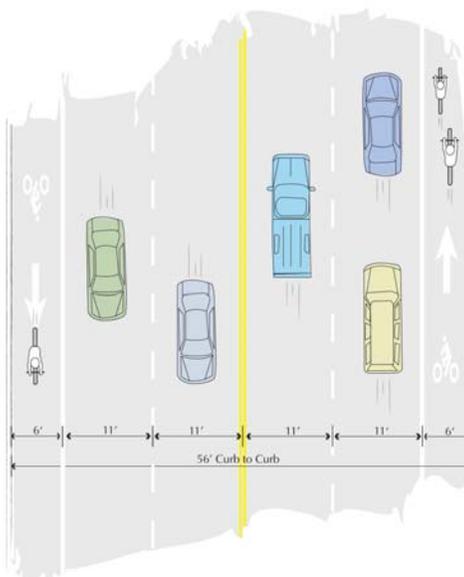
- Parking One Side
- (2) 11' Travel Lanes
- 12' Center Lane
- 6' Bike Lanes
- Speed Limit 35 mph or less



**38' Wide Curb to Curb**

**Alternative 2:**

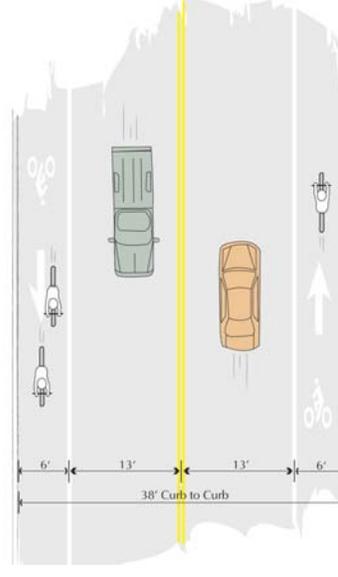
- Parking One Side
- (2) 10' Travel Lanes
- 5' Bike Lanes
- Speed Limit 35 mph or less
- Low truck volumes



**56' Wide Curb to Curb**

**Alternative 3:**

- No Parking
- (4) 11' Travel Lanes
- 6' Bike Lanes
- Speed Limit 45 mph or less

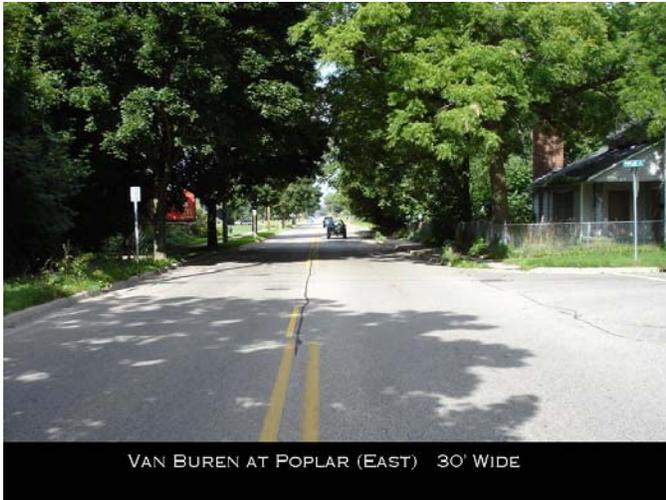


**38' Wide Curb to Curb**

**Alternative 3:**

- No Parking
- (2) 13' Travel Lanes
- 6' Bike Lanes
- Speed Limit 45 mph or less

The photo renderings below illustrate how bike lanes could be accommodated along Van Buren Street. These are provided as examples only in order to convey the concept of on-road bike lanes within the City of Battle Creek.



#### PAVED SHOULDER

Adding or improving paved shoulders often is the best way, particularly in more rural areas, to accommodate bicyclists and benefit motor vehicles. Paved shoulders can extend the service life of the road surface since edge deterioration is significantly reduced. Paved shoulders also provide a break-down area for motor vehicles.

AASHTO suggests that paved shoulders be at least 4-feet wide to accommodate bicycle travel. However, where 4-foot widths cannot be achieved, any additional shoulder width is better than none at all. The measurement of “usable” shoulder width should not include the width of a gutter pan. A five-foot shoulder is recommended measured from the face of guardrail, curb or other roadside barriers. Additional shoulder width is desirable if motor vehicle speed exceeds 50 mph, or the percentage of trucks, buses, etc. is high.

#### NON-MOTORIZED DESIGN RESOURCES

**Guide for the Development of Bicycle Facilities**, American Association of State Highway and Transportation Officials (AASHTO), 1999.

**Michigan Manual on Uniform Traffic Control Devices**, 2005 Ed.

**Bike Lane Design Guide**. Pedestrian and Bicycle Information Center. [www.bicyclinginfo.org](http://www.bicyclinginfo.org).

**A Policy on Geometric Design of Highways and Streets “Green Book”**, AASHTO.

**Recommendations for Accessibility Guidelines: Outdoor Developed Areas**, US Architectural and Transportation Barriers Compliance Board (US Access Board), 1999.

**Designing Sidewalks and Trails for Access: Part II of II: Best Practices Design Guide**, Federal Highway Administration (FHWA), 2000.

**Selecting Roadway Design Treatments to Accommodate Bicycles**, Federal Highway Administration, 1994.

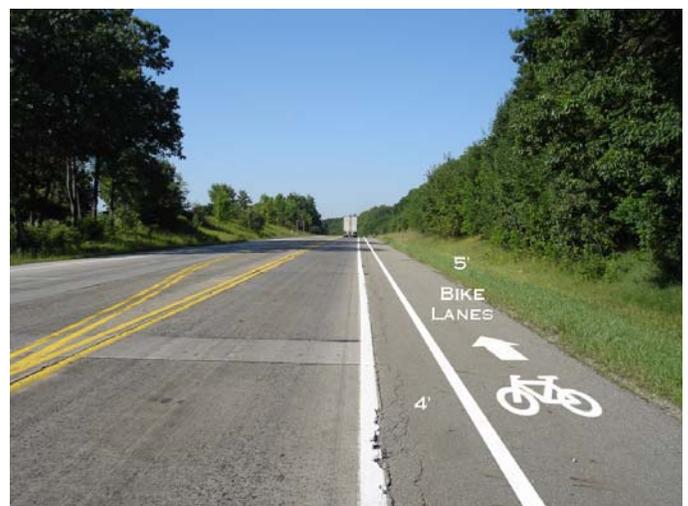
**Michigan Non-Motorized Transportation Facilities Best Practices CD**, MDOT Intermodal Policy Division, 2002.

**Innovative Bicycle Treatments**. An Informational Report. Institute of Transportation Engineers. May 2002.

**Universal Access to Outdoor Recreation: A Design Guide**, USDA Forest Service.

**PEDSAFE: Pedestrian Safety Guide and Countermeasure Selection System**, FHWA, September 2004.

**Logical Lasting Launches**, National Park Service Rivers and Trails Program, 2004. Canoe and Kayak Launches.



Rendered Illustration

Rumble strips or raised pavement markers are not recommended where shoulders are used by bicyclists unless there is a minimum clear path of 1 foot from the rumble strip to the traveled way, 4 feet from the rumble strip to the outside edge of paved shoulder, or 5 feet to adjacent guardrail, curb or other obstacle. Sufficient right-of-way is needed to accommodate the addition of the paved shoulders and, if necessary, to relocate drainage ditches that run parallel to the roadway. The paved shoulder should be of adequate width, smoothly paved, and have adequate strength and stability to support vehicle loads without rutting.

### ROUTE SIGNS

Bicycle travel benefits from uniform sign placement and design. Bicyclists are typically expected to abide by the same signs and markings as motorists, although there are some signs that are designed specifically for bicycle use. In Michigan, mandatory uniform bicycle signs, their placement, and pavement markings are described in Chapter 9 of the Michigan Manual on Uniform Traffic Control Devices. In addition to the MMUTCD requirements, distinctive signs may be utilized to denote specific routes and increase the visibility of non-motorized facilities.

Signed shared roadways are designated by bike route signs, and serve either to:

- provide continuity to other bicycle facilities; or,
- designate preferred routes through high-demand corridors.

Signing of shared (bike and vehicle) roadways for bike routes should indicate to bicyclists that particular advantages exist to using these routes compared with alternative routes.<sup>2</sup> Signing also serves to raise the level of awareness to vehicular drivers that bicyclists are present.

The AASHTO guide recommends considering a number of factors before signing a route:

- the route provides through and direct travel
- the route connects discontinuous segments of shared use paths or bike lanes
- bicyclists are given greater priority on the signed route than on the alternate route
- street parking has been removed or limited to provide more width
- a smooth surface has been provided
- regular street sweeping and maintenance is assured
- wider curb lanes are provided compare to parallel roads
- shoulders are at least four feet wide

In all cases, shared use roadway signing should include information on distance, direction and destination, and should not end at a barrier such as a major intersection or narrow bridge.



D11-1



R4-4



R7-9

Sign image from the Manual of Traffic Signs - <http://www.trafficdesign.com/>  
The sign image copyright Richard C. Steur. All rights reserved.



W11-1 / W16-1

Share the Road with Bicyclists assembly



There are four primary types of signs utilized along designated routes. These include:<sup>3</sup>

- *Route Signs*  
Help to identify connecting non-motorized routes.
- *Directional Signs*  
Include the traditional directional arrows to customized destination or connection signs. Help users find specific destinations or connecting routes.
- *Warning/Advisory Signs*  
Oriented toward non-motorized and vehicular users such as "Bike Crossing", or "Share the Road".
- *Regulatory Signs*  
Inform bicyclists of specific traffic laws or regulations. Examples include "Stop", and "Bike Lane Ends".

<sup>3</sup> Regional Bicycle Plan Toolbox: Signage.

## BLUEWAY WATER TRAIL

A water trail is a stretch of river, a shoreline, or an ocean that has been mapped out with the intent to create an educational, scenic, and challenging experience for recreational canoers and kayakers. For communities across the country, water trails are a flexible and responsive tool for promoting a healthy economy and a high quality of life while preserving our natural and cultural heritage. Water trail projects can energize individuals and unify communities.

Designating the Kalamazoo River and Battle Creek River as blueways was discussed at the public meetings. The rivers are currently utilized for informal canoeing/kayaking. Developing a "water trail" system including directional and interpretive signage, as well as launch/access points would be a desirable, non-motorized amenity within the community.

A map is a key element to a water trail. The map should identify paddling routes, describe levels of difficulty, identify public lands, warn of hazards and communicate rules and regulations. It is a critical guide to provide information to visitors. To prevent inadvertent use of private lands, a water trail map should clearly and accurately indicate all public lands and rest areas. Water trail guides can educate the visitor about conservation concerns and entice paddlers to learn about natural and historic features.<sup>3</sup>

### Guiding Principles<sup>4</sup>

Water trails follow three guiding principles:

#### 1. Environmental Enhancement

- natural resource conservation, preservation and restoration
- volunteer resource stewardship by the users of the resource
- sensitive, sustainable, no-impact use by individuals and business

#### 2. Community Livability

- citizen's rights of access to public waterways and enjoyment of the resource
- scientific, historical and cultural interpretation, appreciation and education
- citizen involvement, local community involvement, action and pride

#### 3. Personal Wholeness

- health and wellness through outdoor exertion
- character growth - building confidence and self-reliance through outdoor skills
- growth through solitude, observation and communication with the wilderness

Design guidelines for launches that are safe and easy to access for paddlers while accommodating the topography and environmental characteristics of the location have been developed by the National Park Service. (Logical Lasting Launches, 2004)

## OTHER CONSIDERATIONS

In addition to the general design guidelines and cross-sections for each typical situation, a variety of other issues must be considered during the design and implementation of the non-motorized system within the City of Battle Creek.

<sup>3</sup> Case Studies of Water Impacts on Rural Communities. L. Johnson, Sept. 2002.

<sup>4</sup> www.nps.gov.

## Railroad Crossings

When at grade railroad crossings are necessary, the non-motorized crossing should be at a right angle to the tracks as much as possible by either a separate path or a widened shoulder. The greater the crossing deviates from 90 degrees, the greater the potential for a bicyclist's front wheel to be trapped in the flangeway, causing loss of steering control. If a right angle crossing is not possible, consideration should be given to the following options:

1. Widening the approaching roadway, bike lane or shoulder will allow the user to cross at approximately 90 degrees without veering into the path of overtaking traffic. The minimum amount of widening should be six feet; however, eight feet is desirable, depending on the amount of available right-of-way. Adequate tapers should be provided.
2. On low-speed, lightly-traveled railroad tracks, commercially available flangeway fillers can eliminate the gap next to the rail. The filler normally fills the gap between the inside railbed and the rail. When a train wheel rolls over it, the flangeway filler compresses. This solution, however, is not acceptable for high-speed rail lines, as the filler will not compress fast enough and the train may derail.
3. In some cases, abandoned tracks can be removed, completely eliminating the problem.
4. If no other solution is available, warning signs and pavement markings should be installed in accordance with the Michigan Manual of Uniform Traffic Control Devices (MMUTCD). A warning sign with an appropriate subpanel message (e.g., Bike Cross at Right Angle) may provide sufficient warning for bicyclists.

## Bike Racks and Parking

Bicycle parking is an important part of bicycle facilities. Long-term bicycle parking is needed at residences, worksites, schools and transit centers to safely store bicycles for several hours at a time. It must be protected from weather and enclosed in a secure space. This can include lockers, storage rooms and fenced areas with restricted access.

Short-term parking is needed at commercial and recreation centers. It should be as close to entrances as possible in a highly visible area to discourage theft and vandalism. At least some short-term parking should be covered. Bike racks should be well anchored to the ground and located where there is adequate clearance, they are visible, conveniently located, and secure.

Bike racks should support the bicycle upright by its frame in two places; prevent the wheel of the bicycle from tipping over; and,



D4-3

Sign image from the Manual of Traffic Signs - <http://www.trafficigns.us/>  
The sign image copyright Richard C. Noeur. All rights reserved.

enable the frame and one or both wheels to be secure. Vandal-resistant fasteners can be used to anchor a rack in the ground. The rack should provide easy, independent bike access. Inverted “U” rack elements mounted in a row should be placed on 30” centers to allow for two bicycles to be secured to each rack element.<sup>5</sup>

The “rack area” is a bicycle parking lot where more than one rack is installed. The aisles separating the racks are measured from tip to tip of bike tires across the space between racks. The minimum separation between aisles should be 48 inches. This provides enough space for one person to walk one bike. In high traffic areas where many users park or retrieve bikes at the same time, such as colleges, the recommended minimum aisle width is 72 inches.

The location of the rack area in relationship to the building or facility it serves is very important. The best location for a rack area is immediately adjacent to the entrance it serves. Racks should not be placed so that they block the entrance or inhibit pedestrian flow in or out of the building. Racks that are far from the entrance, hard to find, or perceived to be vulnerable to vandalism will not be used by most cyclists. Rack areas should be no more than 120 feet from the entrance it serves and should preferably be within 50 feet.

#### Drainage Inlet Grates

Adequate drainage must be ensured to prevent ponding, washouts, debris accumulation and other potentially hazardous situations. The drainage grates should be bicycle-safe. Parallel bar drainage grates can trap the front wheel of a bicycle, causing the bicyclist to be pitched over the handlebars. Parallel bar drain grates can be replaced with modern bicycle-safe and hydraulically efficient models, such as the “vane” or “honeycomb” grates.

Eliminating drainage grate and utility cover hazards for bicyclists can be accomplished by:<sup>6</sup>

- replacing parallel bar drainage grates with bicycle-safe models.
- adjusting grates or utility covers that are above or below the level of the surrounding roadway.
- adopting bicycle-safe design standards for drainage grates on all new construction.
- adopting bicycle-safe standards for leveling utility covers and drainage grates.
- encouraging the location of utilities away from the normal path for bicyclists.

On streets where it is not possible to eliminate or replace a drain grate or other obstruction that is inappropriate for bicycle travel, white permanent markings, as noted in the MMUTCD, should be used to divert the bicyclist from the obstruction.

<sup>5</sup> Bicycle Parking Guidelines. Association of Pedestrian and Bicycle Professionals.

<sup>6</sup> Drainage Grates and Utility Covers. Implementing Bicycle Improvements at the Local Level.



#### Structures Along Shared Use Paths

An overpass, underpass, or bridge may be necessary to provide continuity to a shared use path. On new structures, the minimum clear width path should be the same as the approach paved shared use path, plus the minimum 2-foot wide clear areas. This provides needed maneuvering space to avoid conflicts with pedestrians and other cyclists. Emergency and maintenance access should also be considered. Where practical, a vertical clearance of 10-feet is desirable. Railings, fences, or barriers on both sides of a trail on a structure should be a minimum of 42-inches high.

Where it is necessary to retrofit a shared use path onto an existing highway bridge, several alternatives should be considered:

- Carry the shared use path across the bridge on one side. This should be done where 1) the bridge facility will connect to a path at both ends, 2) sufficient width exists on that side of the bridge or can be obtained by widening or restriping lanes, and 3) provisions are made to physically separate bicycle traffic from motor vehicle traffic.
- Provide either wide curb lanes or bicycle lanes over the bridge. This may be advisable where 1) the shared use path transitions into bike lanes at one end of the bridge and 2) sufficient width exists or can be obtained by widening or restriping.

#### MAINTENANCE

Developing maintenance guidelines, standards, and policies will be essential in assuring a safe, well-used non-motorized system. Common maintenance concerns and solutions for on-road bike lanes are described in the following text.<sup>7</sup>

#### Surface problems

For potholes and other surface irregularities, patch to a high standard, paying particular attention to problems near bicyclists' typical travel alignments. Require other agencies and companies to patch to a similarly high standard; if repairs fail within a year, require remedial action.

<sup>7</sup> USDOT Federal Highway Administration. Bicycle Facility Maintenance.

*Debris (sand, gravel, glass, auto parts, etc.) near the right edge of the road*

Sweep close to the right edge. If necessary, use vacuum trucks to remove material, especially if it accumulates adjacent to curbs. Pay particular attention to locations such as underpasses, where changes in lighting conditions can blind bicyclists to surface hazards. For debris or surface irregularities on curves or at intersections, pay special attention to the areas between the typical paths of turning and through motor vehicle traffic; often these fill with debris and are in typical bicyclist trajectories. In addition, areas where debris washes across the paved surface should receive special attention; for example, eliminating the source of the problem by providing better drainage is ultimately a more cost-effective solution than increased sweeping.

*Chip seal gravel*

Many local agencies use chip seal to extend the lives of their roadways. However, the technique, which involves laying down a coating of oil and a layer of crushed rock, often leaves deep piles of gravel just to the right of the typical travel paths of motor vehicles. To reduce the impact on bicyclists, remove excess gravel as soon as possible and suggest alternative routes as detours.

*Ridges or cracks*

These should be filled or ground down as needed to reduce the chance of a bicyclist catching a front wheel and crashing. Pay particular attention to ridges or cracks that run parallel to the direction of travel. One common location to check is where a merging lane is provided just beyond an intersection. Because traffic must merge left to continue traveling straight, the bicyclist will be crossing the joint between the merge lane and the through lane at a very shallow angle.

*On-road bicycle signs*

Special bicycle signs (regulatory, warning, or information) should be maintained in the same way that other roadway signs are. Pay particular attention to bike route signs at decision points, warning signs at special hazard locations, and regulatory signs on popular bike-lane streets.

*On-road bicycle markings*

Bicycle lane striping should be renewed at the same time that other stripes are painted. The same goes for bike-lane pavement markings. Some markings may suffer from more wear-and-tear than others and deserve special attention.

Common maintenance concerns and solutions for off-road, shared use trails and paths are described in the following text. Implementing routine maintenance and inspection can minimize repair and renovation costs.<sup>8</sup>

- **Trail Inspection**  
Trails must be inspected on a routine basis. Inspections should include the trail surface, any culverts and water crossings, all amenities, signs, and surrounding vegetation. User safety should always be the primary consideration of any inspection. Potential safety problems should always
- **Repairs to Signs and Other Amenities**  
These repairs may include kiosks, wood and metal signs, benches, etc. These amenities need to be kept in safe and aesthetically pleasing condition. Items that fall into disrepair often become the target of vandals. Repairs should be completed as quickly as possible to discourage vandalism.

take precedence when scheduling maintenance. Vandalism left unattended encourages more of the same and should likewise be a high priority for maintenance. Graffiti and “tagging art” should be documented with incident reports and police should be notified, then the graffiti removed or covered as soon as possible. Inspections may also need to be done after severe weather events or storms.

- **Mowing**  
Mowing should be done on a regular basis to prevent trails from becoming overgrown. Brush and grass that grow along trails should not be allowed to grow to excessive heights within two feet of the edge of the trail surface.
- **Tree and Brush Pruning**  
Pruning is performed for the safety of the trail user and to protect the trail and other assets located along the trail. Proper pruning also allows mowing operators to do a thorough and safe job. Inspectors need to be trained to identify potential hazards and to determine what can be handled by staff and what will require the attention of a private contractor.
- **Leaf and Debris Removal**  
Keeping the trail surface clean is one of the most important aspects of trail maintenance. Mud and other sediment should be removed along with fallen leaves and branches to ensure the safety of users and to increase the life expectancy of the trail itself.
- **Snow and Ice Removal**  
Decisions should be made early on as to whether trails will be cleared of snow and ice. Snow and ice should be removed, particularly from trails used by children going to and from school sites.
- **Cleaning and Replacement of Culverts**  
Culverts often become clogged with trash and debris that must be removed to prevent flooding and undercutting of trail surfaces. Culverts may also need to be upgraded in size or replaced because of deterioration or increased storm water flow due to increased surrounding development.
- **Maintenance of Water Crossings**  
Water crossings can be bridges, fair weather crossings, or open box culverts. Debris needs to be removed on an as-needed basis from these structures to allow for free flow of water and to reduce the risk of flooding. These structures need to be inspected on a regular basis for erosion control and action taken accordingly to preserve or replace the structure.

<sup>8</sup> Fairfax County Trail Maintenance Standards.

**Safety and Security**

Safety considerations should be at the forefront of design decisions for any non-motorized project. Several design guidelines and suggestions have been referenced within this chapter as they relate to improving and ensuring safety for users. The combination of a multitude of factors assists in developing and maintaining a safe non-motorized system. These include elements such as bicycle safe drainage grates, and providing adequate clearance along the edges of trails, paths and bike lanes. Considering pavement textures, sight distances, design speeds, proper striping and signage go a long way to help make non-motorized systems safe. Providing adequate lighting is also important in areas where bike lanes and trails are used frequently during hours of darkness. Choosing an appropriate type of trail based on the situation and conditions is also important. For example, when there are a significant amount of curb cuts, it is typically much safer to have on-road bike lanes rather than trails off road, within the right-of-way. Providing access points and adequate room for emergency and maintenance vehicles is also important to trail safety. Proper and regular maintenance of non-motorized systems is essential when it comes to providing a safe and enjoyable system. Routine officer patrol of trails is important to improve overall security of the system.