ARENAC HERITAGE ROUTE AUTHORITY

BICYCLE AND PEDESTRIAN TRAILS MASTER PLAN

2014

STANDISH MICHIGAN

ACKNOWLEDGEMENTS

ARENAC HERITAGE ROUTE AUTHORITY

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FUNDED BY

Central Michigan District Heath Department's Through a Grant From
Together We Can Program

Together We Can
build a healthier community!

Made possible by funding from the Centers for Disease Control and Prevention

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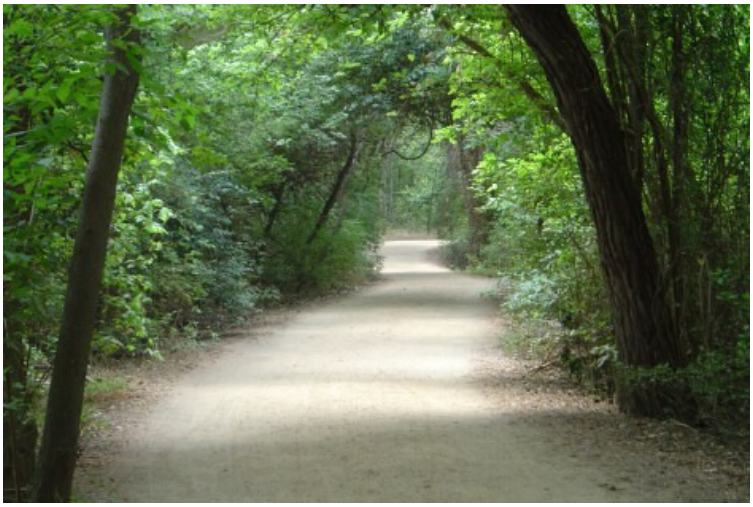
Engagement Plan

The Arenac Heritage Route Authority will engage the citizens of Arenac County and all those interested in the Pedestrian & Bicycle Trails Master Plan process in order to have maximum community input and so that there ultimately will be maximum benefit to community members and visitors using the existing and the new proposed trails. The Authority will advertise the project through various means: the county's website, the US-23 Heritage Route's website, newsletters, the local school districts, bicycle shops, riding and hiking groups, and others as identified in the process. The Authority will call upon appropriate stakeholders and others who may be interested in, or benefit by, the Pedestrian & Bicycle Trails Master Plan project.



- *A 2000 Michigan State University Survey about the Pere Marquette Rail-Trail found that 62% of trail users cited exercise as the primary reason for using the trail and 73% said they reported improvement in their health due to use of the trail.*

Once the above steps have been taken, a project commencement meeting will be held to discuss the project with the following agenda:

Explanation and Overview of the Pedestrian & Bicycle Trails Master Plan

Goals

- Raise awareness of the project and purpose for trails
- Discuss benefits of non-motorized trails
- Propose potential trails systems
- Discover hubs, linkages and connections for downtowns, residential areas, the countryside, parks, cultural locations, educational facilities, and natural settings
- Establish priorities and objectives for the project and future trails

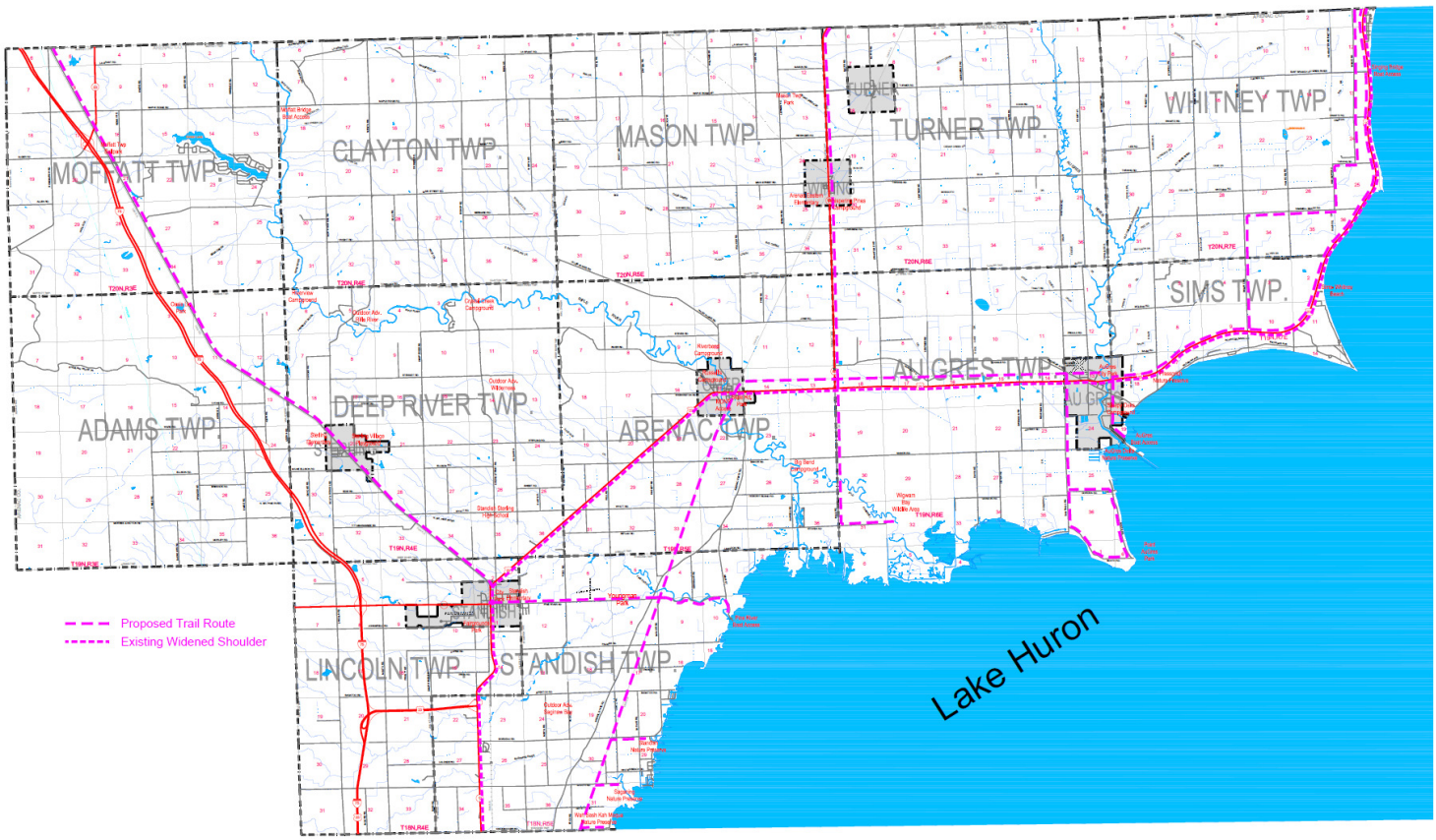
- Develop a marketing plan and promotional program
- Establish a signage plan
- Consider all season usage
- Future connections – ally with connecting communities.
- Form a trail advisory committee (e.g., Friends of the Trails group)

After preliminary draft plans are completed, the trail committee will reconvene to review and critique the proposed Pedestrian & Bicycle Trails Master Plan. The final plan will then be completed and a presentation to the whole community will be held to portray the master plan and to discuss the efforts for implementation of the plan. The plan will be promoted through the same media as the original project commencement announcements and any other ways discovered by the committee during the process.

- *In 2002 and 2004 surveys of recent home buyers sponsored by the National Association of Home Builders and the National Association of Realtors, trails were ranked as the second most important community amenity on a list of 18 choices – bettering even*
- *Golf courses and playgrounds.*

The Arenac Heritage Route Authority will then continue the project to fruition using all its outreach capabilities to keep everyone informed of the project's progress and to attract participants to help construct and use the proposed trails.

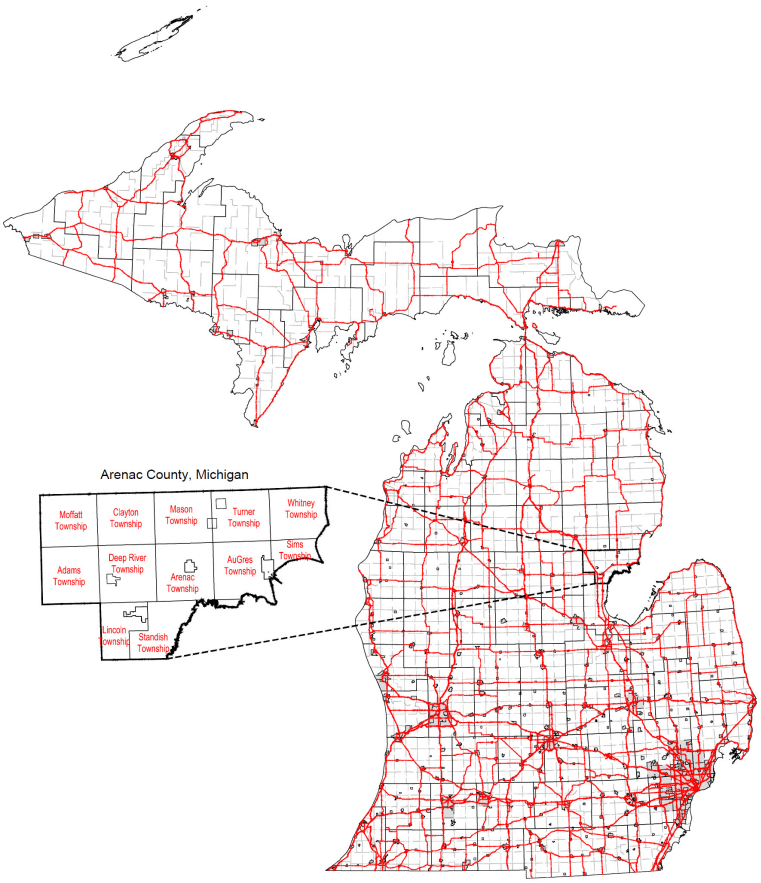
The Arenac Heritage Route Authority met with its consultant to discuss this plan and to determine primary stakeholders for this project. An informational meeting date for the Authority and stakeholders was held on June 18, 2013 and again on July 10, 2013. At these meetings the project was described and the stakeholders' roles were explained. The Engagement Plan was reviewed and additional input was gathered. Also, a preliminary Points of Interest map was reviewed and proposed routes for trails were examined. Meetings were then held monthly to review the plan's progress and to advise the consultants. Finally, the completed Pedestrian & Bicycle Master Plan was presented to the Authority and community members on the 7th of July 2014.



Preliminary Points of Interest & Route Map for Arenac County

Community Description

Arenac County is located on the shore of Lake Huron in the east central section of Michigan's Lower Peninsula. It includes 368 square miles, or 238,097 acres. Arenac County is bordered by Iosco and Ogemaw Counties to the north, Bay County to the south, Gladwin and Bay Counties to the west. Lake Huron makes up the county's eastern border. The county is 30 miles wide from east to west at its widest point and 17 miles from north to south at its deepest point. The following townships are located in the county: Adams, Arenac, Au Gres, Clayton, Deep River, Lincoln, Mason, Moffatt, Sims, Standish, Turner, and Whitney. The county also includes the cities of Au Gres, Omer, and Standish and the villages of Sterling, Turner, and Twining. Several unincorporated places exist in the county. They are Alger in Moffatt Township, Melita and Maple Ridge in Clayton Township, Worth, Pine River, Saganing, and White's Beach in Standish Township, Moores Junction in Adams Township, Old Arenac Village in Arenac Township, Point Au Gres in Au Gres Township, Point Lookout in Sims Township, and Whitestone Point in Whitney Township.

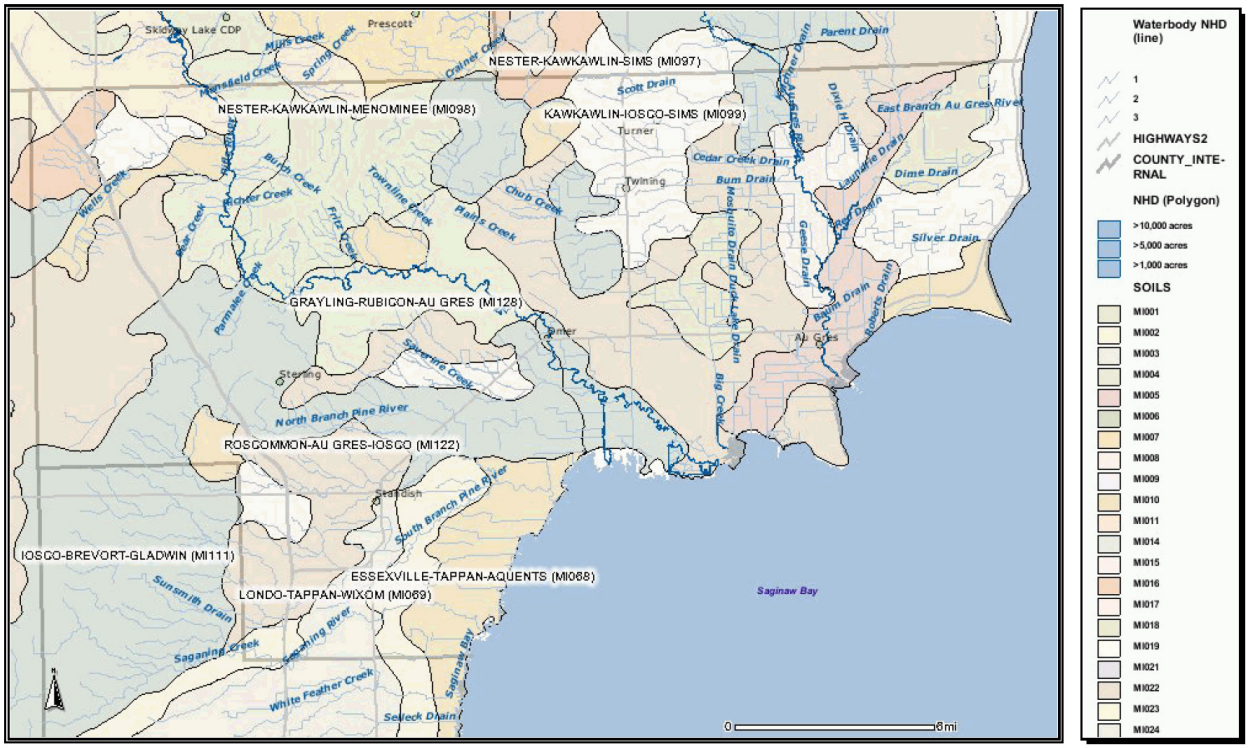


The climate of Arenac County is relatively mild. The close proximity to Lake Huron modifies abrupt variations in temperature. The climate is further modified by the westerly winds from Lake Michigan, which bring warm, moist air in winter and cool, moist air in summer. February temperatures average 20.3 degrees F. July temperatures average 65.8 degrees. Annual precipitation, in inches, is 28.7. Most of the precipitation falls as rain. Precipitation during the growing season is sufficient for a wide variety of crops. The mean annual snowfall for the period 1940 to 1969 was 42.5 inches. The ground is covered with snow an average of 82 days a year. Prevailing winds from the southwest and are generally strongest in March, although conditions near the shoreline vary widely. The length of the growing season varies within different areas of the county from 120 to 140 days; the area along Lake Huron having the longest growing season, and the area in the extreme northwest corner of the county having the shortest.

The Saginaw Bay and the Pine, Rifle, and Au Gres rivers and their tributaries offer excellent fishing. Walleye, Coho, and Chinook salmon produce exceptional sport fishing. Whitetail deer are present in abundant numbers throughout the county. The best numbers are found

in the Gladwin Forest Area, in part of the Au Sable State Forest, and in the Wigwam Bay Wildlife Area. Recent timber cuttings and oak stands are the most attractive areas for deer. Ruffed grouse and woodcock are present along streams, lowland brush, and recent aspen cutting sites. Squirrels are present in oak stands on public land. Waterfowl hunting is excellent in the Wigwam Bay Wildlife Area and along the Saginaw Bay. Snipe hunting is great in the mud flats of Saginaw Bay during low water periods.

Most of Arenac County is an old lake bed. Small areas consist of ground moraines and waterlaid moraines. In the lake bed areas, the material ranges from clay to clay loam, loam or sand in texture. In many places this fine-textured material has been covered by sand that ranges from six inches to many feet in thickness. Deep deposits of sandy material occur throughout the lake bed, but they are predominantly in the northwestern part of the county. Elevation of the lake bed ranges from slightly less than 600 feet to 750 feet above sea level. The soil associations found in the County are listed below.



STATSGO Soils Map of Arenac County

Dense forests originally covered most of Arenac County. The only areas that were not forested were swamps, lake beaches, sand dunes near Lake Huron, and small areas cleared by the Indians for their villages and gardens. On the sandy plains of the county in well-drained areas there were forests consisting of white pine, red pine, and jack pine. On the finer textured, well-drained soils, sugar maple, beech, yellow birch, elm, and hemlock grew. Elm, ash, basswood, red maple, aspen, yellow birch, white pine, hemlock, black spruce, white cedar, and balsam fir were dominant on the somewhat poorly drained mineral soils. In the peat and muck swamps, the native trees were mostly white cedar, black spruce,

balsam fir, and tamarack. Reeds, sedges, and shrubs grew in openings in the swamps. About 45 percent of the County is now wooded, but the stands are mostly second-growth trees of poor quality. Aspen, scrub oak, and jack pine are the trees on the sandy plains where the virgin timber was mostly pines. In the other forests, the present stands consist chiefly of the original trees but the proportion of aspen in the stands is greater. Nearly 15,000 acres are woodlands on farms and products of these wooded areas provide some cash income to farmers. Most of the remaining woodland is owned by the State of Michigan. About 20,000 acres in the county have been planted to pines. Much idle land in the county is reforesting naturally according to the Soil Survey, Arenac County, Michigan.

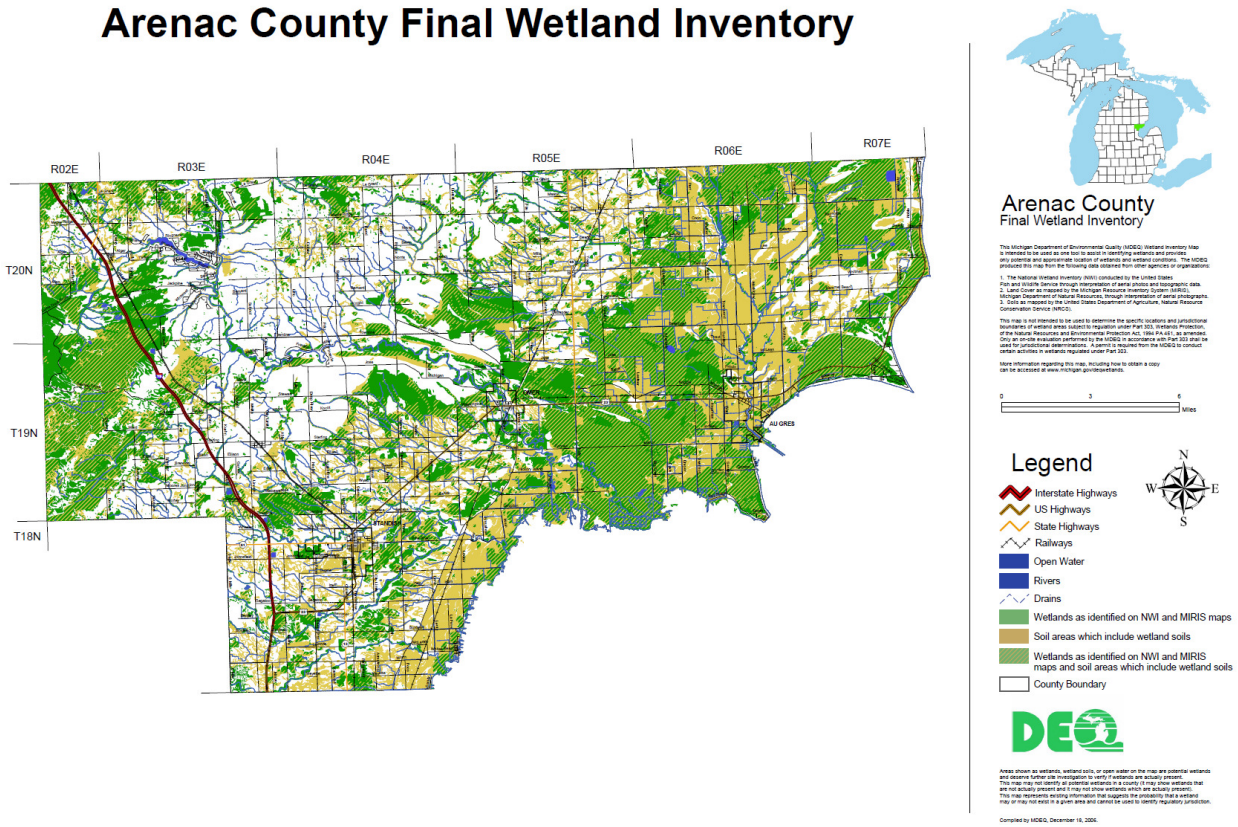
Land uses for Arenac County as compiled by the United States Department of Agriculture Soil Conservation Service show:

Total Area	238,000 acres
Water Areas	4,400 acres
Land Surface	233,600 acres

The following uses of land surface were shown:

Cropland	74,400 acres
Pasture and Idle Grassland	16,000 acres
Rural Transportation	7,800 acres
Forest Land (non-federal)	113,500 acres
Other Rural Land	12,900 acres
Urban Land	8,900 acres
Federal Land	100 acres

The 2007 Census of Agriculture shows 488 farms encompassing 94,604 acres. This number has increased from the 2002 survey that showed 381 farms, an increase of 28%, and 83,724 acres, an increase of 13%. Of the forest land, which comprises over 48% of all Arenac county acreage, 28,464.63 acres are owned by the Michigan Department of Natural Resources as of July, 1989. This is 11.95% of the total gross area. Most of the MDNR property is in the Gladwin Forest Area, part of the Au Sable State Forest. The MDNR also owns 2,500 acres in the Wigwam Bay Wildlife Area which is dedicated to the improvement of waterfowl habitat and open to public hunting for deer and waterfowl. In addition, the State of Michigan has 109 acres of boating and fishing sites. There is no acreage owned by the U.S. Forest Service in Arenac County. There are approximately 110 acres of U.S. Indian Reservation in Saganing.



Farming is an important aspect of Arenac County's economy. According to the 2007 Census of Agriculture, land in farms comprises 39.7% (94,604 acres) of all land in the county. Of this land in farms, 74,429 (78.7%) acres is cropland; the other 20,175 acres is woodland, pasture land, or land used for other purposes, and only 1.6% of the cropland is irrigated. The market value of farm products sold was $29,730,000, an average of $60,922 per farm for 2007.

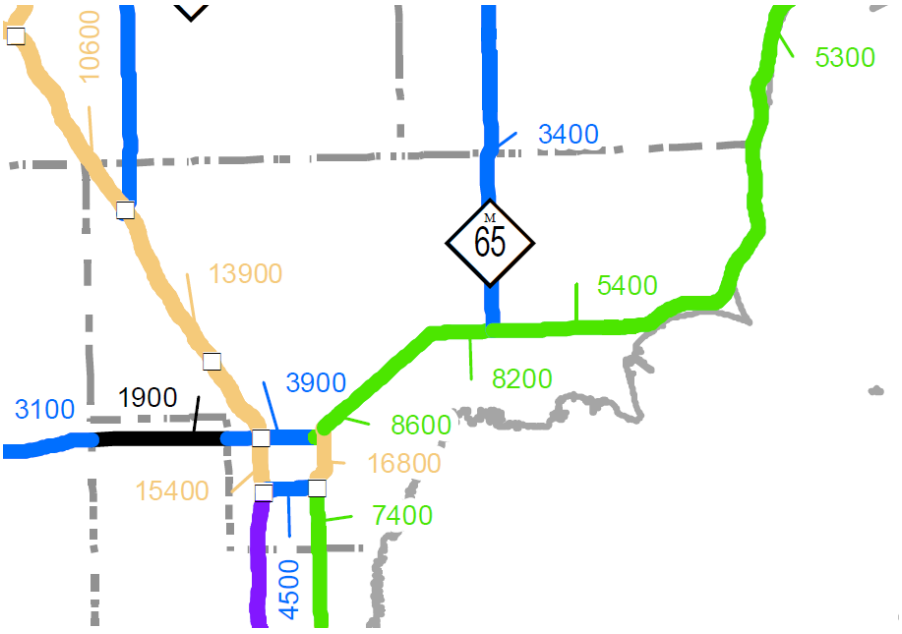
Consumers Power Company supplies electric power to customers throughout the County and natural gas to the major population areas. Of the 5,651 occupied homes in the County in 1990, 32.8% are heated with natural gas, 3.6% with electricity, 24.8% with bottled, tank or LP gas, 20.0% with fuel oil or kerosene, 17.0% with wood, and the remaining 1.8% with other fuel types including coal, coke, and solar. Telephone service is provided by several companies. Century Telephone Midwest, Inc. provides service to the cities of Au Gres and Omer and a few other areas with the "876" exchange. Service in Standish with the "846" exchange is received through Ameritech. The Pigeon Telephone Company supplies service to Mason and Turner Townships including the Villages of Turner and Twining and parts of Au Gres Township with the "867" exchange. Service to Sterling with a "654" exchange, Alger with the "836" exchange, and outlying areas with the "873" exchange is provided by Alltel Michigan, Inc.

The Cities of Au Gres and Standish have both city sewer and water systems. City water is also available to the City of Omer and the shoreline areas of Sims and Whitney Townships

and a small area of Standish Township. The villages of Sterling and Twining have municipal sewage systems. The Township of Au Gres is attempting to secure centralized water facilities for its southeastern tip. Other areas within Arenac County have private water wells and septic systems. Arenac County had a total of 13,824 tons per year of solid waste disposal requirements for 1993, the most recent year available. The county has no remaining permitted solid waste disposal capabilities.

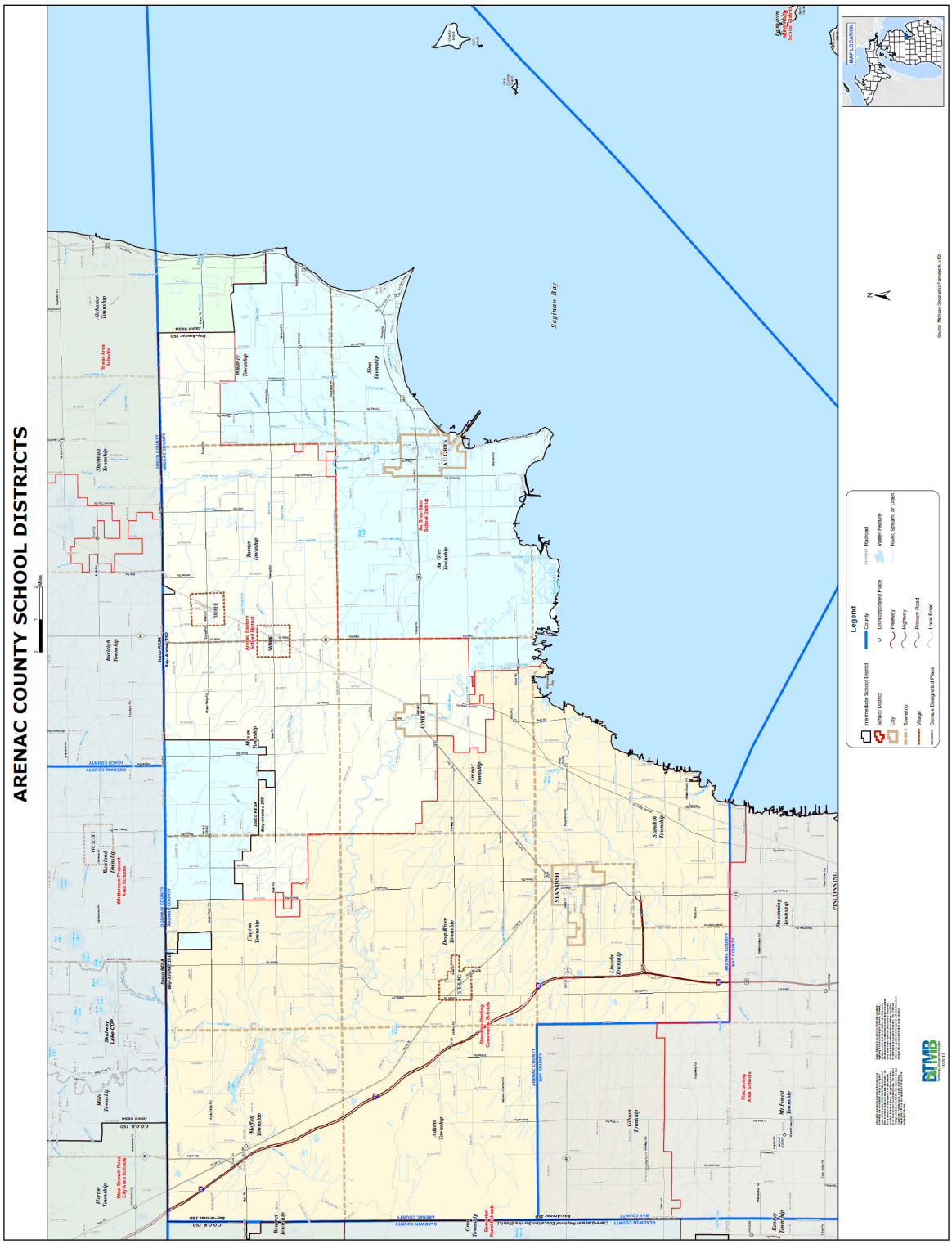
Arenac County is covered by two major newspapers-the *Arenac County Independent*, a weekly newspaper and the *Bay City Times*, a three-day a week newspaper. Major television coverage is provided by WNEM-TV, Bay City (NBC); WJRT-TV, Flint (ABC); WWTV-TV, Cadillac (CBS); and WUUC, Bay City (public television). There is no radio station located within the County. CMU Public Broadcasting airs through 96.9 WSTD in Sterling. Local radio service is provided through several cities which include: WHNN, WGER, and WXOX, Bay City; WSGW, WKNX, WKQZ, and WlOG, Saginaw; WDBI, WIOS, and WKJC, Tawas City; and WBMB and WBMl, West Branch. Many other radio stations are also available to County residents.

The nearest airport supporting general passenger travel is the Midland-Bay City-Saginaw (MBS) International Airport located in Freeland (Saginaw County), approximately 40 miles southwest of Standish. In 2009, MBS had 22 daily flights and 267,436 yearly passengers. The airport is served by two carriers with 148 weekly departures and arrivals by 13 single engine, 5 multi-engine and 9 jet engine aircraft. Arenac County has a county-wide public transportation system – the Arenac County Transportation (ACT). The Indian Trails and the North Star Lines have bus service from Arenac County to major population centers and to other destinations within the state and nation.



Freight is trucked within the county by local trucking companies. The Lake State Railway serves Arenac County with two lines. UPS and Fed-Ex serves all of Arenac County. Arenac County is principally accessible from the north and south by 1-75, US-23, M-13, and M-65. East/west travel is limited to M-61, a section of US-23, and paved secondary roadways. 1-75 traverses Arenac County from its southwest border through the northwest corner toward West Branch. There are four exits. From south to north they are the US-23 connector two miles south of Standish, M-61 two miles west of

Standish, the Sterling exit, and the M-33 exit near Alger. Standish has been long known by Michigan travelers as a place to stop for food and gas.



Demographics

Arenac County's population decreased by 5.5 percent from 2000 to 2010 going from 18,627 to 17,609. Over this ten-year period, the state decreased 10%, while the United States population increased 10%.

Arenac County residents, similar to most of the region, are almost all white (96.8%) and are almost equally divided between the sexes, (8,056 male, 7,843 female). More than half of residents are homeowners (83.6%) where the average household size is 2.34 persons. The median age in the county is 46.7 years, with 20.3% of the population aged over 65 years of age.

The average commuting time for county residents is 28.4 minutes as compared to 25 minutes for the average commuter time for all U.S. residents. Many residents travel to local cities such as Bay City, Saginaw, and Midland for work and shopping.

Population Change
Arenac County
2000 - 2010

Governmental Unit	2000	2010	Change	Percent
Adams Township	550	563	13	2.4%
Arenac Township	992	903	-89	-9.0%
Au Gres Township	1,007	953	-54	-5.4%
City of Au Gres	1,028	889	-139	-13.5%
Clayton Township	1,101	1,097	-4	-0.4%
Deep River Township	2,244	2,149	-95	-4.2%
Lincoln Township	1,522	942	-580	-38.1%
Mason Township	994	851	-143	-14.4%
Moffatt Township	1,121	1,184	63	5.6%
City of Omer	337	563	226	67.1%
Sims Township	1,091	1,095	4	0.4%
Standish Township	2,026	1,900	-126	-6.2%
City of Standish	1,581	1,509	-72	-4.6%
Whitney Township	1,033	1,001	-32	-3.1%
Arenac County Total	17,296	15,899	-1,018	-5.5%

Source: U.S. Census Bureau, Census

Age Distribution

Arenac County

2000 and 2010

Arenac County

Age	2000	2010	Percent of Total
0 - 24 years	5,366	4,318	27.1%
25 - 44 years	4,633	3,268	20.6%
45 - 65 years	4,410	5,097	32.1%
65 and over	2,860	3,216	20.2%

Source: U.S. Census Bureau, Census

Native vs. Foreign Born Citizens

Arenac County

2000 - 2010

Arenac County

Age	2000	2010	Change	Percent
Native Born	17,083	16,323	-760	-4.4%
Foreign Born	186	164	-22	-11.8%

Source: U.S. Census Bureau, Census

Male / Female Ratio

Arenac County

2000 - 2010

Arenac County

Sex	2000	2010	Change (2000-2010)	Percent Change
Male	8,863	8,056	-807	-9.1%
Female	8,406	7,843	-563	-6.7%

Source: U.S. Census Bureau, Census

Race Characteristics

Arenac County

2000 - 2010

Category	2000	2010	Change from 2000 to 2010	Percent Change
White	16,472	15,899	-573	-3.5%
Black or African American	315	29	-286	-90.8%
Other	304	310	6	2.0%

Source: U.S. Census Bureau

Occupancy Characteristics

Arenac County

2000 - 2010

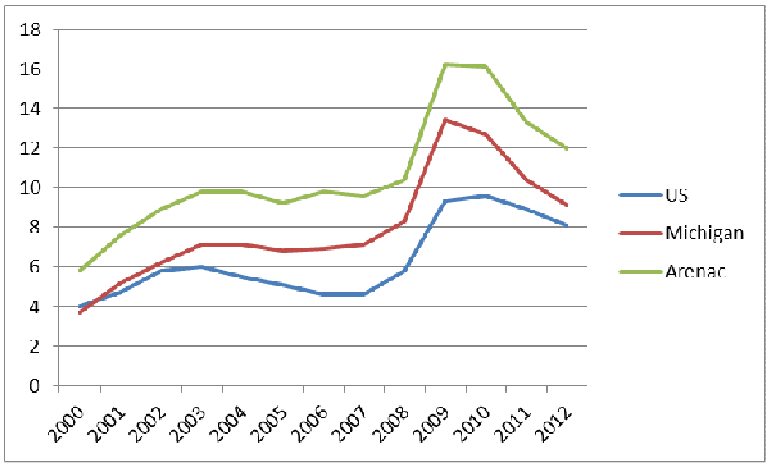
Arenac County

Age	2000	2010	Change	Percent
Occupied	6,710	6,701	-9	-0.1%
Vacant	2,853	3,102	249	8.7%
Seasonal	2,274	2,398	124	5.5%

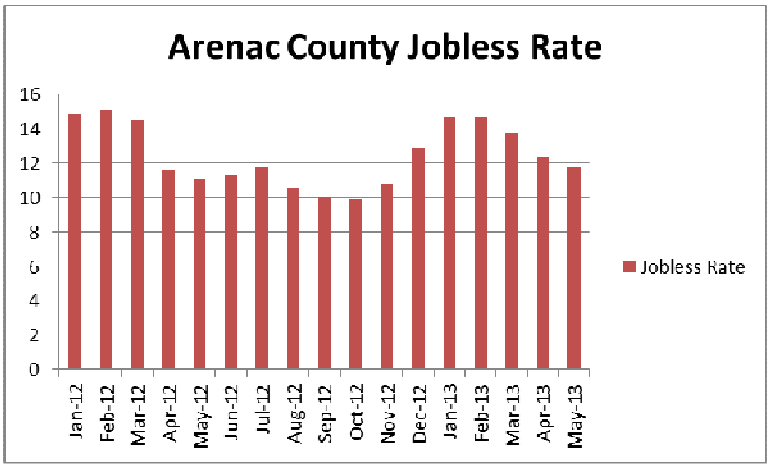
Source: U.S. Census Bureau, Census

County Socioeconomic Characteristics

The main economic sectors of the county are Care and Social Assistance (23.4%), Accommodations and Food Service (14.9%), Manufacturing (12.9%), and Government (10.3%). Most workers are employed in educational, and health care social assistance occupations (26%) or manufacturing (16%). Agriculture accounts for about 2% of the counties employment, however the market value of products sold increased by 32% between 2002 and 2007 with a total of $29,730,000 making agriculture a major economic factor in the county. About 9.1% of workers are self-employed. Seventy-eight percent of workers drive alone when traveling to and from their workplace and the mean commute time is 28.4 minutes. Median household income, as reported in 2011, was $36,281 (per capita dollars $19,386). The 2011 American Community Survey indicated 13.5 percent of families are below the poverty level. According to the State of Michigan Office of Labor Market Information, the annual unemployment rate for the county in 2012 was 12.0 percent.



Annual Jobless Rates



Arenac County Economic Statistics

Income:

Median household income - $36,281 (2007-2011) US Census Bureau
Per capita income- $19,386 (2007-2011) US Census Bureau

Retail Sales:

Total retail sales – ($1,000) = $118,751 (2007) US Census Bureau
Per capita retail sales $7,144 (2007) US Census Bureau

Employment:

Total labor force – 7,664
Employed – 6,372
Unemployed – 1,293
Percent Unemployed – 12% in 2012

Major Manufacturing Employers:

Auburn Bean and Grain Company
Bay City Shovels
Bessinger Pickle Co., Inc.
Bopp-Busch Manufacturing Co.
Crew Products Co.,
Globe Sprinkler Corp.
Hayes Lemmerz
Magliner
Maple Ridge Hardwoods
Vantage Plastics

Needs Assessment

Despite the county's outstanding natural opportunities for outdoor activities and exercise, Arenac County residents fall into the lower ranks of health statistics within the state. The information which follows demonstrates the factors in the county regarding the status of county citizens' health.

Central Michigan counties and their ranking (out of 82 Michigan counties evaluated) on health outcomes and health factors, as listed in the 2011 County Health Rankings.

County	Health Outcomes		Health Factors			
	Mortality	Morbidity	Health Behaviors	Clinical Care	Social and Economic Factors	Physical Environmental
Arenac	61	53	31	77	67	16
Clare	81	80	67	72	78	6
Gladwin	69	76	77	79	73	25
Isabella	43	32	16	78	13	40
Osceola	52	40	34	45	57	34
Roscommon	79	49	68	21	76	1

Source University of Wisconsin's Population Health Institute and the Robert Wood Johnson Foundation. 2011 County Rankings.

Physical Inactivity and Overweight Trends among Youth

- 1 in 3 high school youth do not engage in vigorous physical activity
- Less than 30% attend daily physical education
- 1 in 7 youth ages 6-19 is overweight
- Children spend more time watching television in a year than they do attending school

Source: Community Active Living and Public Health Presentation

Vulnerable Populations (Possible health risks, barriers to care, etc.)

County residents who:	
Have no high school diploma	2,715
Are unemployed	869
Severely work disabled	518
Have major depression	1,070
Are recent drug users	1,264

Source Together We Can Initiative, CMDHD, Arenac County Community Portrait 2011

Access to Care

Uninsured individuals (under age 65)	1,662
Medicare beneficiaries	
Elderly (age 65+)	3,060
Disabled	697
Medicaid beneficiaries	4,037
Primary care physicians per 100,000 pop	30.6
Dentists per 100,000 pop	42.8

Source Together We Can Initiative, CMDHD, Arenac County Community Portrait 2011

Major leading national causes of death

Injuries	16%
Cancer	14%
Heart Disease	23%

Source NCHS Vital Stats. Reporting Sys 1991-2005

Risk Factors for Premature Death

Diabetes	9% of adults
No Exercise (Sample size fewer than 50)	No Report
Few Fruits/Vegetables (Sample size fewer than 50)	No Report
Obesity (Sample size fewer than 50)	No Report
High Blood Pressure (Sample size fewer than 50)	No Report
Smoker (Sample size fewer than 50)	No Report

Source CDC Behavioral Risk Factor Surveillance System, 2000-2006

Arenac County's Unfavorable Health Factors compared to U.S Rates

- Births to unmarried women
- No care in first trimester
- Coronary Heart Disease
- Stroke
- Suicide

Source NCHS Vital Stats. Reporting Sys 1991-2005

The Disappearing Walk to School

- *1 in 4 trips made by 5-15 years old are for the journey to and from school*
- *Only 10% of these trips are made by walking or bicycling*
- *Of school trips one mile or less, about 28% are walk-based and less 1% are bike-based.*

Source: Community Active Living and Public Health Presentation

Infectious Diseases

Although rates of HIV and tuberculosis are not available, the only common diseases that respond to public health efforts that indicate closer attention in Arenac County are Pertussis and Hepatitis B.

National Air Quality Standards

Arenac County meets or exceeds all national air quality standards.

Recreation Plans

Arenac County has a current five-year recreation plan as do the following communities within the county:

The City of Omer, the City of Au Gres, the City of Standish.

In February of 2012, after two-years of research, meetings and much work by the Central Michigan District Health Department, the district published its "Community Health Assessment and Improvement Plan." The major findings of the report for its service area, including Arenac County, put forth health priority areas that are directly affected by increased recreational and physical activities such as those set out in this trail master plan.

The strategic health priorities of concern for this plan include (our emphasis):

Nutrition, weight status and physical activity

- Lack of nutritious food, especially in restaurants, daycares and schools
- Comparatively higher costs of nutritious foods
- ***Lack of education/knowledge about nutrition, including availability of nutritious foods, nutritional educational opportunities, and importance of physical activity.***

Environmental Health

- ***Lack of recreational facilities and organized physical activities***
- Harmful effects of chemicals in local environments, water quality, and lack of recycling opportunities.

Transportation

- Lack of inter-county transportation services, especially for medical services
- ***Lack of convenient bike/walking paths*.**

The plan also included the formation of the Together We Can Health Improvement Council and Arenac County's Arenac Community Needs Assessment Planning Committee. The Needs Assessment Committee was formed, met, and surveyed the residents of the county. The survey identified Arenac County's primary health concerns from the priority areas developed by the council. High on the list of concerns are *Nutrition, weight status and physical activity* (45.05% of respondents) and *Environmental Issues* (30.63% of respondents).

A preliminary analysis of bicyclists and pedestrian pathways and other facilities in Arenac County shows some planning (MDOT, EMCOG and the Arenac County Heritage Authority) but virtually no pathways or programs instituted to encourage walking or biking. The Arenac County Parks and Recreation Commission operates three parks and is currently engaged in developing a water trail along its Saginaw Bay shoreline. There are five school districts in the county that operate athletic programs but there is no coordination among the districts and the county for pedestrian and bicycle facilities.

Nationally, rates of obesity and overweight have been increasing dramatically. The U.S Department of Health and Human Services reports that a approximately 300,000 US deaths a year are associated with obesity and overweight (compared to 400,000 deaths a year associated with smoking). In Michigan the 200 Behavioral Risk Factor Surveillance System indicated that 62% of adults in Michigan are overweight and the number of overweight children has tripled over the past twenty years. Physical inactivity is a primary factor causing these conditions.

Health Benefits of Using Trails

- Regular physical activity is a key component of any weight loss effort. Greater access to trails can directly impact our nation's obesity epidemic by improving access to places for physical activity and opportunities.
- Participating in aerobic training significantly reduces systolic and diastolic blood pressure. Trails provide the opportunity for individuals to help control their hypertension (high blood pressure)
- Moderate physical activity such as walking and cycling on trails can protect against developing non-insulin dependent diabetes.
- Through aerobic exercise training, walking and cycling on trails can improve symptoms of mild-to-moderate depression and anxiety of a magnitude comparable to that obtained with some pharmacological agents.
- Studies have reported that walking two or more miles a day reduces the chance of premature death by 50%

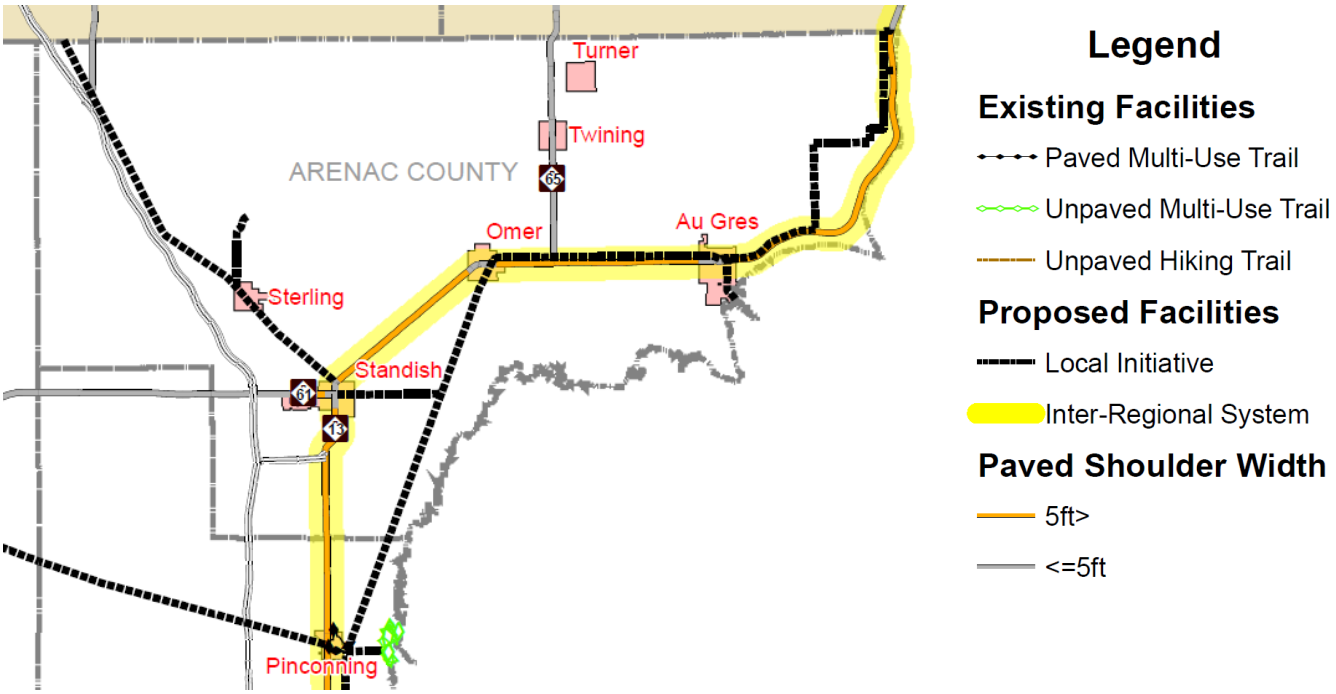
Source: National Center for Disease Prevention and Health Promotion

Hiking and biking trails have become an important means to fight against obesity and inactivity. The National Center for Chronic Disease Preventive and Health Promotion (Centers for Disease Control) has stated that there is now scientific evidence that providing access to places for physical activity increases the level of physical activity in a community and has a large impact on the overall health of their users. The Task Force on Community Preventive Services strongly recommends enhancing access to trails and other places for physical activities.

A 1995 nationwide Personal Transportation Survey by the US Department of Transportation found that nearly 25% of all trips are less than one mile, but more than 75% of these short trips are made by automobile. Although bicycling and walking will not work for all short trips, these non-motorized modes may be practical for many of them. Leading to an increase in activity and possible improvement in health.

The State with the Michigan Trails and Greenway Alliance and many others have developed and continue to develop a statewide system of trailways.

The East Michigan Council of Governments with funding from the Michigan Department of Transportation has prepared the Bay Region Non-motorized Transportation Plan which includes a proposed trail along the old Michigan Central railroad corridor from Pinconning to Omer then east through Au Gres and north to the Arenac county line and another inter-regional trail following M-13 and along US-23 to the north boundary of Arenac County.



MDOT Bay Region Non-Motorized Facilities Map for Arenac County

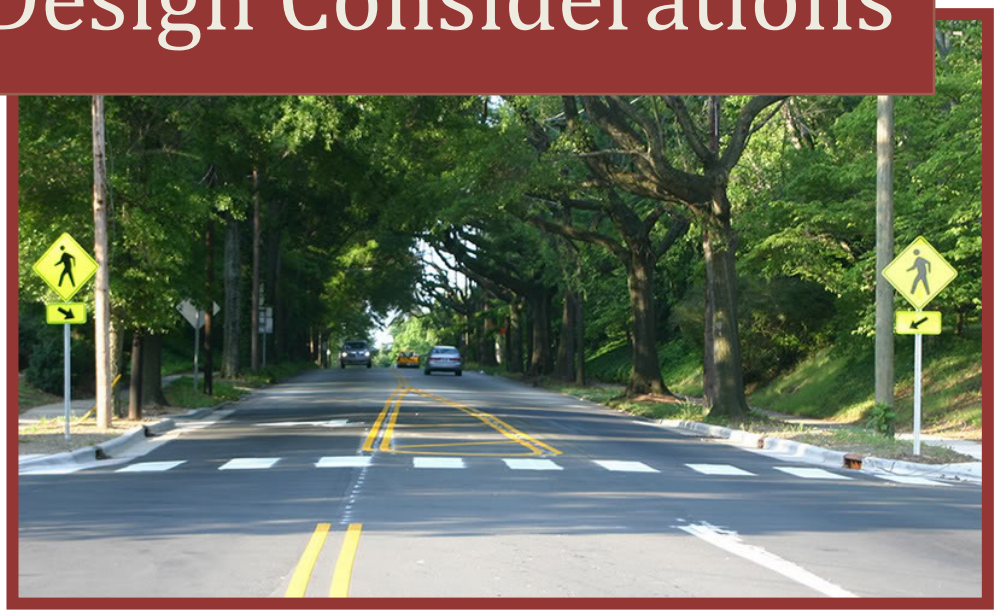
Conclusion

Hiking and biking trails can be used by everyone in a community from athletes in training to handicapped individuals. Intervening in the built environment has become a focus for public health officials. Our plan will set out a system of trails throughout Arenac County that can provide physical exercise and access too many of the county's other recreation assets.

Richard Jackson, MD, Director of the Center for Disease Control, National Center for Environmental Health, states in the 2001 report, "Creating a Healthy Environment: The Impact of the Built Environment on Public Health," It is dishonest to tell our citizens to walk, jog, or bicycle when there is no safe or welcoming places to pursue these life-saving activities."

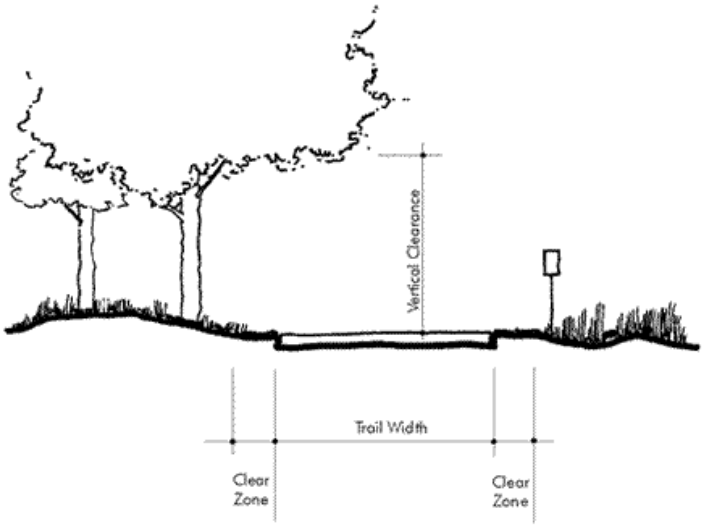
The residents of Arenac County, although not the least healthy in Michigan, can certainly be aided by the development of recreational and transportation facilities that offer and encourage increased physical activity. Exercise, along with proper nutrition, can help decrease weight and decrease heart disease and diabetes as well as many other health problems. This master plan will also put forth suggestions for programming among the region's providers of recreation and transportation that will permit healthy activities for all ages and increased hiking and bicycling for transportation and pleasure.

Design Considerations



Introduction

The key to successfully accommodating multiple modes of non-motorized transportation is to involve all users early in the planning and design phase. This will ensure that the variety of needs, based on user type, are fully understood, and where feasible, incorporated into the final design and construction. With the expectation of on-road bike lanes and already designated special purpose trails, the vast majority of routes in the area are likely to be multi-purpose. This could include a variety of users such as pedestrians, bicyclists, in-line skaters, equestrians, and those with strollers, wheel chairs, etc.



Designing and constructing trails and non-motorized systems is often as complicated as building roads. There are undoubtedly a number of agencies and groups that need to be involved in the planning and design process and multiple issues must be considered and resolved. The following pages provide guidance and example cross-sections for typical non-motorized sections and situations. While planning designing and constructing a connected non-motorized system will require some continuity and coordination between communities to ensure quality and connectivity, there remains a strong desire for each community to have its own character within the system. These are intended as guidelines only, although they are based on standards established by the American Association of State Highway and Transportation Officials (AASHTO), state agencies, and non-motorized organizations.

Regardless of where a non-motorized system is

Regulatory Approvals Often Required For Greenway/Trail Implementation

Regulatory Approval	Reviewing Agency
Section 106 clearance	State Historic Preservation Office
NEPA	MDOT/Federal Highway
Floodplain Impacts	FEMA/MDEQ
Inland Lakes & Streams	MDEQ
Construction Permits	Local Jurisdiction Arenac County Road Commission
Erosion & Sediment Control	Drain Commission
Section 404	Army Corps of

built or who builds it, users should expect a safe, user-friendly, and accessible system. Nearly every accepted design guideline has exceptions necessitated by local conditions, community desires, 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. These design guidelines are not all inclusive.

Trail / Pathway Element	Recommended Dimensions	Comments
RECREATION TRAILS		
Paved Pedestrian-Only Trail Width	5 ft minimum 6 ft desirable	These trails are for exclusive use by pedestrians
Unpaved Pedestrian-Only Trail Width	2 ft minimum 4-6 ft desirable	Best as limited purpose facility in rural or semi-primitive areas; can provide interim solution; minimum width should only be used in constrained areas.
Unpaved Shared-Use Trail Width	6 ft minimum 8-10 desirable	Only suggested as an interim solution and not appropriate for high use trails; best in rural or semi-primitive areas.
Vertical Clearance	8 ft minimum 10 ft desirable	Additional clearance improves visibility. Ten feet is a minimum when equestrian use is expected.
SHARED USE PATHS / NON-MOTORIZED SYSTEM		
Shared Use Path Width	10 ft minimum 12 ft desirable 14 ft optimum	Minimum width should be used only where volumes are low and sight distances are good; width should be based on relative speed of users; higher speed users require greater widths
Roadway Separation	5 ft minimum	Minimum separation for parallel, adjacent path; a physical barrier should be installed where minimum separation cannot be met.
Shoulders	1 ft minimum 2 ft minimum	Shoulders should provide pull-off/ resting and passing space; should be graded to the same slope as the path; minimum shoulder width of 1 ft should only be used in constrained areas.
Clear Zones	1 ft minimum 2 ft desirable	Clear zones are additional lateral clearance on each side of the path beyond the shoulders. All obstructions should lie outside of the clear zones.
Vertical Clearance	8 ft minimum 10 ft desirable	Additional clearance improves visibility

Bicycle Trails

During design of road improvements, shared roadways require improvements that promote bicycle-safe design practices as described in the *Guide for the Development of Bicycle Facilities* (AASHTO), so that costly retrofits can be avoided. Several design features of roadways can be made more compatible to bicycle travel including bicycle-safe drainage grates, bridge expansion joints, rail crossing treatments, pavement textures, sight distances and signal timing and detector systems. All of those elements should be considered for safety and efficiency. However, the most critical feature affecting the capability of a roadway to accommodate the bicycle is road width. Two means to providing adequate road and width for both vehicular and bicycle travel are paved shoulders and bike lane restriping. Often roads are designed with a wide shoulder to enhance the service life of the road, facilitate drainage, and maintain adequate sight distances. Paving of these shoulders is an effective means to prevent edge deterioration of the road surface as well as to accommodate bicycle travel.

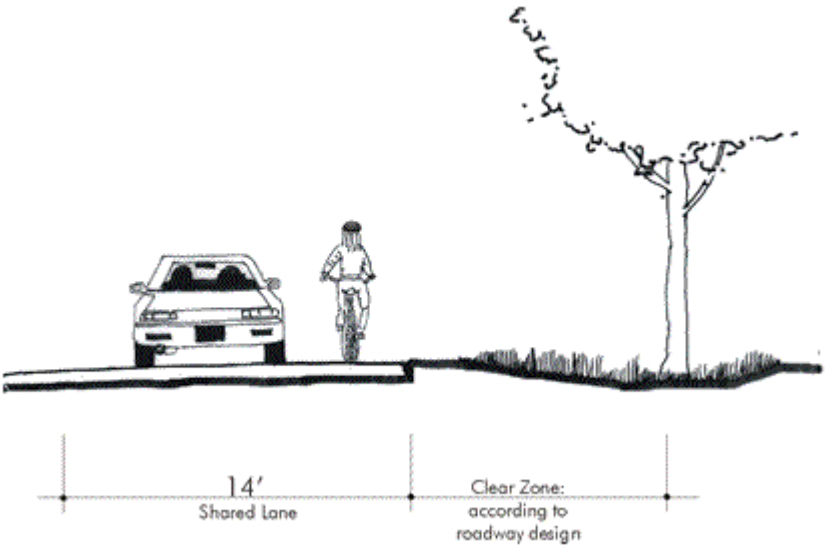
Side paths are two-way shared paths located adjacent to a roadway, such as an extra wide sidewalk. This facility type is not recommended in some urban environments due to space limitations, operational problems, and safety hazards at intersections. Side paths can be useful facilities along waterways, linear parks or in a roadway corridor with limited adjacent development. Some of the design criteria which should be evaluated when considering the development to side paths include:

- Available Right-of-Way: to accommodate a 10’ wide path, there should be 15-20’ of available right-of-way. This is necessary to provide for a 3’ clear zone from obstructions, a 10’ wide trail and a 5’ buffer space to separate the path from the road (per AASHTO standard, if there is less than a 5’ buffer width, a 4.5’ high physical barrier should be constructed).

- Number of Street and Driveway Intersections: as the number of interactions between the bicyclist and traffic increases, the chances of a collision and serious injuries also increase. For this reason, side paths should not be considered when there are more than 12 residential driveways, 6 commercial driveways/minor streets, or 3 major street intersections per mile. Should more bicycle/vehicle interactions occur a cyclist would face more than 1 interaction every 30 seconds. As a result the safety and utility of the path deteriorates dramatically.

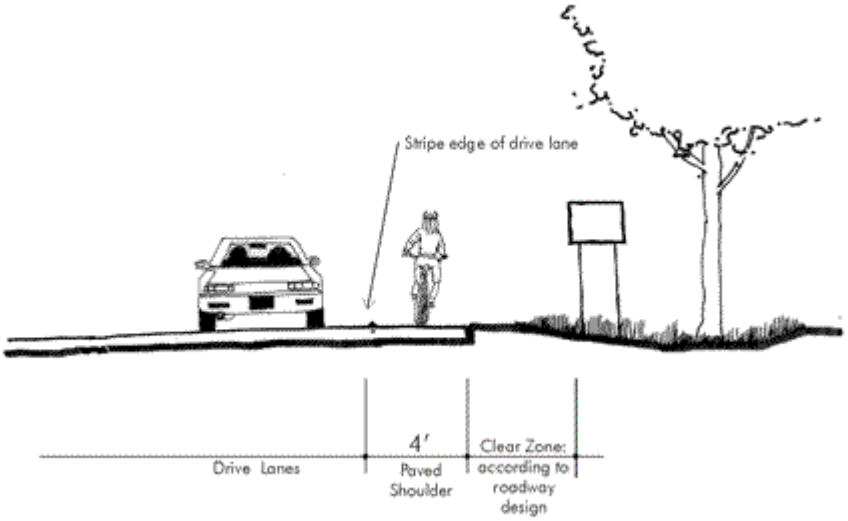
- Final Design Consideration: the above criteria are very important to assess feasibility during the planning stages of this project. However, when the trailway moves into the design and construction stage, additional problems will need to be resolved. These problems consist of providing access to destinations located on the opposite side of the street from the side path, modifying signal timing to permit non-motorized users to move through an intersection without being hit by turning traffic, removing obstructions from the sight triangle, locating crosswalks, the proper

distance from the parallel roadway, and providing appropriate curb cuts and transition areas so that bicyclists may access the path from both the parallel intersecting streets.



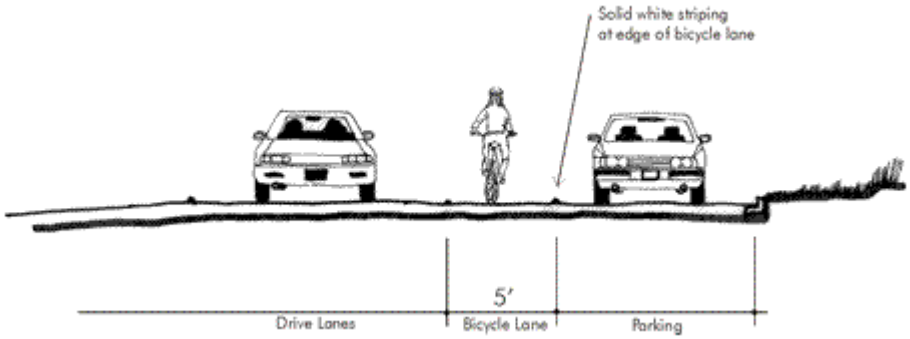
Low speed/low volume streets and roadways are the best choice for bicycle routes. Under such circumstances, cars and bicycles can effectively share a 12' or 14' wide travel lane, with no special accommodations for bicycle travel needed, such as wide curb lanes or striped bicycle lanes.

The bicycle space is not striped, and generally the total width is less than a road with paved shoulder or bike lane treatment. Streets with wide curb lanes may be signed as a bicycle routes when traffic volumes and speeds are moderate to low.



Bicycle lanes are a portion of the roadway, generally not less than 4' wide, that have been designated by striping, signs, and pavement markings, for the preferential or exclusive use of bicyclists. Bicycle lanes are generally implemented as one-way facilities located on either

side of the street, with arrows and pavement markings indicating the proper direction of travel.



When on-street parking is present, the bicycle lane must always be placed between the parking lane and the travel lane, not next to the curb. Since bicycle lanes are highly visible they are often referred to as "host facilities." And as such invite people to consider riding their bikes as an alternative to driving.

Bicycle lanes are most appropriate on streets with moderate to high volumes of traffic, where most cyclists would not feel comfortable sharing a lane of traffic without the additional operating space. When implementing these, it is important to pay attention to the lane striping treatment at intersections to help ensure that vehicles and bicycles are aware of each other when turning and merging.

Traditionally, shoulders are designed to provide structural support for a roadway and offer a breakdown and recovery area for motor vehicles. When paved, maintained, and of sufficient width, shoulders provide space for bicycle and pedestrian travel lanes by striping, and may be designated as a bike lane through the addition of signing and pavement markings, preferably when speeds are posted 45 mph or lower.

In urban areas, a wide curb lane is a cost-effective means to safely provide a designated section of the road for bicycles. The designation of a bike lane in pavement striping tends to deter motorists from swerving to the left to avoid bicyclists that may be traveling along the curb lane. Bike lanes should be one-way facilities and carry bike traffic in the same direction adjacent motor vehicles. A bike lane width of five feet is recommended and should only occur on the right-hand side of the travel lane. A wide lane of six to eight feet is recommended when larger vehicle traffic is numerous and higher vehicle speeds are permitted. A smooth riding surface is necessary as well as drainage and utility grates that are bicycle-friendly and flush with the surface.

Bike lane pavement marking can be designated at the edge of the travel lane with a four-inch solid white line. Raised pavement markings and barriers can cause steering difficulties and, therefore, should be avoided. Bike lane pavement marking should never extend through the intersection and never cross pedestrian crosswalks.

Grate covers are potential obstructions to bicyclists and, therefore may result in serious damage to the bicycle wheel and frame and/or injury to the bicyclists. Drainage inlet grates with slots parallel to the roadway or gaps between the grate and frame can trap the front wheel of a bicycle causing a loss of control. Several models of bicycle-safe and hydraulically-efficient grates are available in the marketplace and retrofitting is easily accomplished and relatively inexpensive.

Shared Use Paths

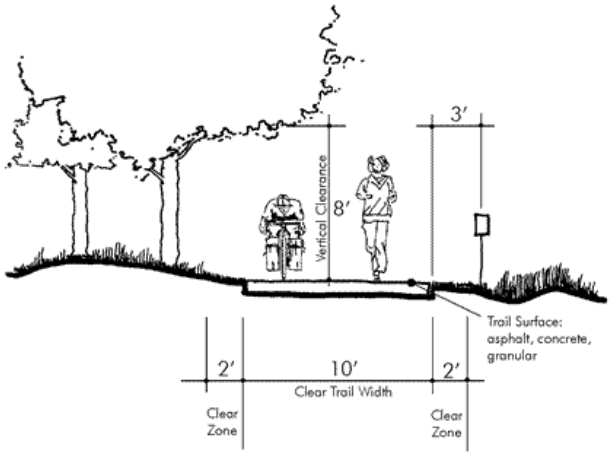
Trails separated from motor vehicles can provide for differing levels of accessibility. The level of accessibility depends to a great extent on the setting. In urban areas, full accessibility is typically expected. Therefore, easy access, smooth hard pavement, and easy gradient are the norm.

In more rural areas and primitively developed recreation areas, full accessibility is not expected. Trails tend to serve a varying level of accessibility and may have segments that use granular surfacing, steeper gradient and sometimes unpaved surfaces. Individuals are free to choose a trail that provides the recreation experience and degree of challenge desired.

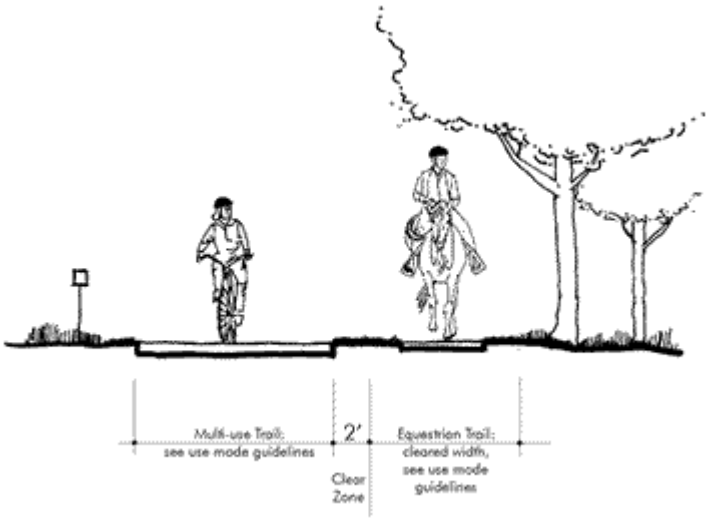
The mix of pedestrian and bicycles on multi-purpose trails is not without problems and can result in conflicts between different trail users. However, when design treatments are employed to address these potential conflicts, the majority of user problems can generally be avoided.

Paths shared by pedestrians and bicyclists should 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,
- It is recommended to sign and mark a four-inch wide solid 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 possibly a 12-foot minimum in more heavily-used sections. A separate, soft-surfaced jogging or equestrian path may be constructed using wood chips, compacted crushed gravel, or other resilient material, parallel to, but separated from, the paved shared-use path.



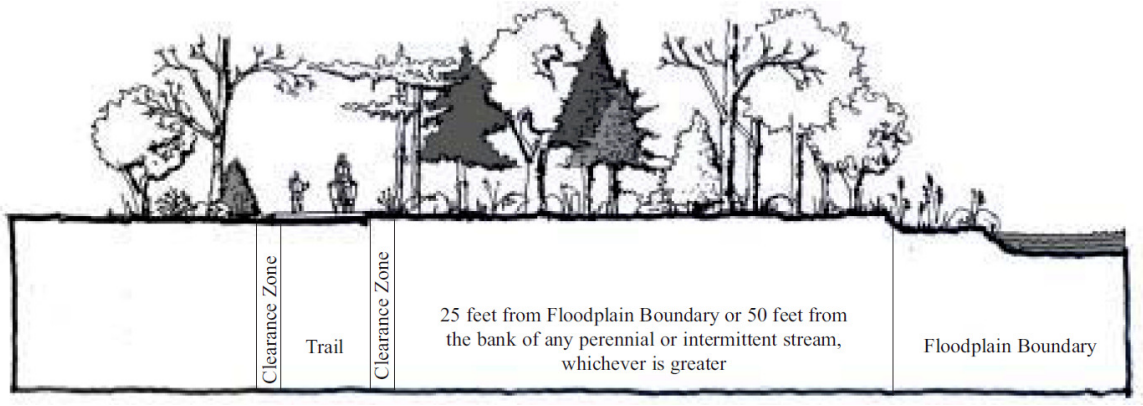
The compelling rationale for placing a non-motorized system within an existing right-of-way is single, continuous ownership as well as access to various destinations. However, conflicts at intersections and driveways are a major concern on paths located adjacent to roadways. Motorists will often not see bicyclists or pedestrians coming toward them on the right, since they do not expect to see them going against the flow of traffic. AASHTO has documented numerous concerns related to this type of environment and several conditions could exist during planning and design:

- A minimum of five feet horizontal separation or a physical barrier from motor vehicle traffic.
- Development of bike lanes and sidewalks as an alternative to the shared path is not feasible or permitted.

- There are no reasonable alternative alignment for bikeways and sidewalks on nearby parallel routes.
- The path can be terminated onto streets with good bicycle and pedestrian facilities at each end.
- There are popular origins and destinations throughout the corridor.
- The path can be constructed wide enough to accommodate all type users, with delineation and separation techniques to minimize conflicts between users.

Riparian Corridors

Riparian corridors and greenways are one of the preferred locations for the provision of non-motorized facilities and connections. However, consideration and potential impacts of the project to the natural environment must be considered for a project to successfully balance recreational, transportation and interpretive opportunities with protection of the greenway's environmental assets. If constructing a trail within a riparian corridor, permits will likely be necessary prior to construction. Consultation with appropriate professionals and specialists to evaluate the most ecologically appropriate alignment of the trail project is essential.



Except during flood events, riparian corridors are accessible for a variety of recreational pursuits and are a good choice for trail development. However, there are a few restrictions that need to be considered during project planning:

- Limit trails to one side of the river or stream, especially in damage-susceptible areas.
- Route trails through areas of least habitat value. i.e., disturbed areas and stands of invasive vegetation.
- Avoid long stretches of path immediately adjacent to riverbanks.
- Avoid nesting areas of wildlife
- Avoid wetlands if possible.
- Filling of floodplain and wetlands requires permitting.
- Avoid loss of mature trees and native vegetation

- Route locations may need to be diverted away from the natural resource due to unresolved private property issues.

A primary design issue associated with trails in riparian corridors is trail surface treatments. In natural areas, such as floodplain forest basins, natural surface materials such as aggregates and crushed stone may be appropriate. They will need yearly maintenance after flood waters recede but will have minimal impacts on the environment and adverse effects from flooding. Care should be taken to grade and compact the natural surface to a firm and stable state that is accessible to all users.

In urban areas, hard surfaced trails can provide important links in a non-motorized network and will experience heavier use. Trails should be surfaced with concrete or asphalt due to the frequency and velocity of flood waters typical to the urban floodway. Aggregate surfaces should not be used. In areas that are periodically inundated or cross wetlands, boardwalks constructed on piles or piers that limit disturbance to the existing system are preferred. In all cases, erosion and sediment control measures are required during construction.

When trailways are to be constructed adjacent to waterways special design treatments should be considered due to the susceptible natural environment, poor soils, and potential for flooding. A buffer of existing vegetation must be preserved to stabilize the riverbanks and minimize soil erosion into the river system. For views of the waterway, it is recommended overlook points be provided rather than removing vegetation and constructing trails to the water's edge. Where vegetation clearing is needed within the trail corridor, hand clearing is often recommended to minimize erosion and disruption of areas beyond the corridor. Water edge trails must be designed with maintenance considerations in mind. The path surface is often constructed of concrete to resist root damage and to withstand flooding. Often traversing areas with poor soil characteristics, these trails need to be provided with a supportive sub base. The use of geotextile fabric is typically required for additional stability and increased load bearing capacity. Maintaining cross drainage is important both across the trail's surface, as well as under the trail. Trails along waterways are very popular with users who enjoy the opportunity to have access to natural environments, and thus provide an excellent opportunity to educate trail users about natural habitats.

Rail Trails

This trail type is a shared use path that utilizes the right-of-way of an abandoned railroad corridor. Once the tracks and ties are removed, there is usually approximately 15'-20' width of ballast (the rocky substructure that supports the trains) remaining on which to construct the multi-use path. The remaining width of the right-of-way accommodates changes in grade for cut or fill sections, which allowed the railroad to follow a maximum five percent grade. With this wide right-of-way and the existing sub base, it is usually very

straightforward and relatively inexpensive to construct trails within abandoned rail corridors.

It is recommended that the existing railroad grades be converted to hard surface trails in the form of asphalt paving. Crushed slag or limestone screening may be used on rural sections that will experience lower levels of use, especially by pedestrians, wheelchair users, and in-line skaters, users requiring a smoother and harder surface.

A rail-with-trail multi-use path is built within the right-of-way of an existing and active railroad. When such trails are located adjacent to branch lines or industrial spurs, the separation between trails and tracks is typically more than 30 feet, with some as close as 8 feet. Frequently, minimal barriers are constructed between the trail and the tracks in the form of either vegetation or a change in grade elevation.

Water Trails

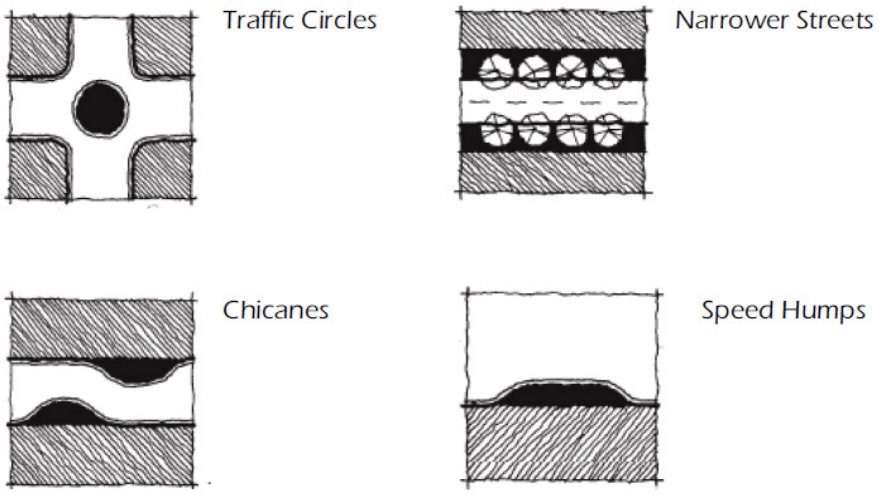
Water trails are specifically designed for a small, non-motorized boats to have access to the local waterway, features and stopping points along the way, public parks and the area's natural landscape. Users may experience the ecosystem in the region and acquire a respect, understanding, and stewardship of the natural resources. Water trails can also provide links to local culture and provide interpretive information about the environment and history of the area.

A map is the key element to a water trail. Including paddling routes, difficulty levels, public lands, warnings of hazards, and rules and regulations. Water trail guides can educate the visitor about conservation concerns and entice paddlers to learn about natural and historic features. It should also provide information regarding low-impact use and regulations to protect and enhance natural and heritage resources.

Traffic Calming

Wherever trails and roadways intersect, there is a potential safety hazard. Slower speeds produce better reaction times and a safer environment. The practice of traffic calming utilizes innovative design methods to slow traffic in certain areas. The Institute of Traffic Engineers has defined traffic calming as, "the combination of mainly physical measures that reduce the negative effects of motor vehicle use, alter driver behavior, and improve conditions for non-motorized street users."

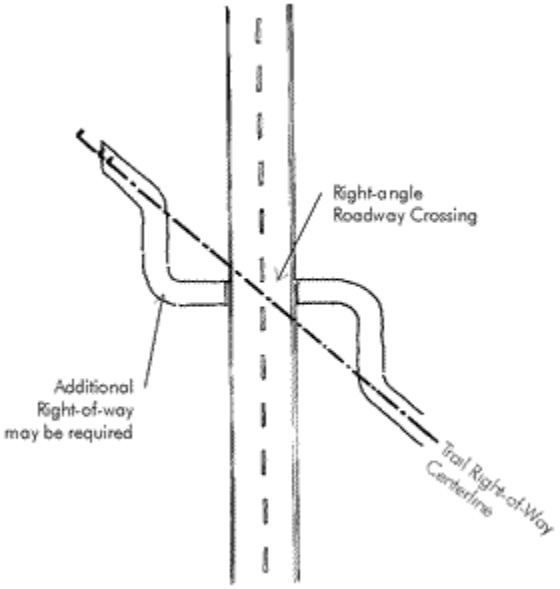
Traffic circles, chicanes, narrowed streets, and speed humps are only a few of the common methods used to calm traffic, and provide a safer more enjoyable experience for non-motorized travelers.



Source: Georgia DOT Pedestrian and Streetscape Guide

Intersections

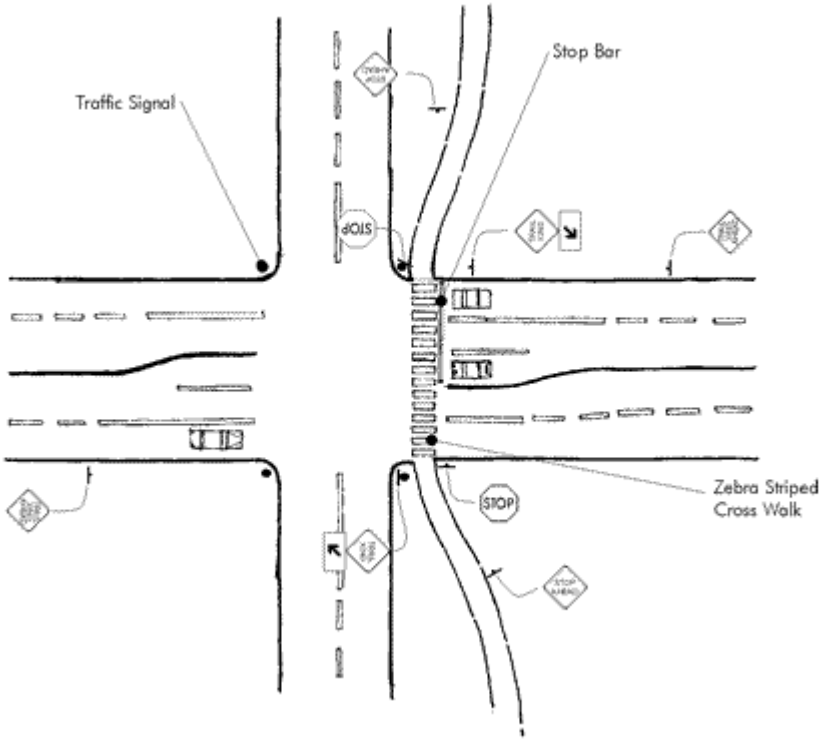
Careful placement of signage and pavement markings is needed on both the roadway and trail to alert motorists and trail users to the presence of the intersection. Advance warning signs and pavement markings should be placed at an adequate distance from the intersection given the speed of the traffic. Trail identification signage, set back outside the road right-of-way, also acts as a warning of approaching intersection.



Regardless of the surfacing material of the trail, a stable pavement free of loose aggregate should be used for the portion of the trail that approaches the road intersection. Pavement increases traction for bicycle users where it is needed most and allows for pavement markings. This also minimizes the accumulation of loose aggregate from the trail on the crosswalk. The change in materials can also help to notify users of the upcoming intersection.

The stable pavement should be used along the portion of the trail that leaves the trail bed and curves in approach of the intersection, therefore the amount used at each intersection varies. Care should be taken to make the transition between materials as seamless as possible. At rural intersections, gravel shoulders should also be paved adjacent to the trail to minimize debris in the stopping zone.

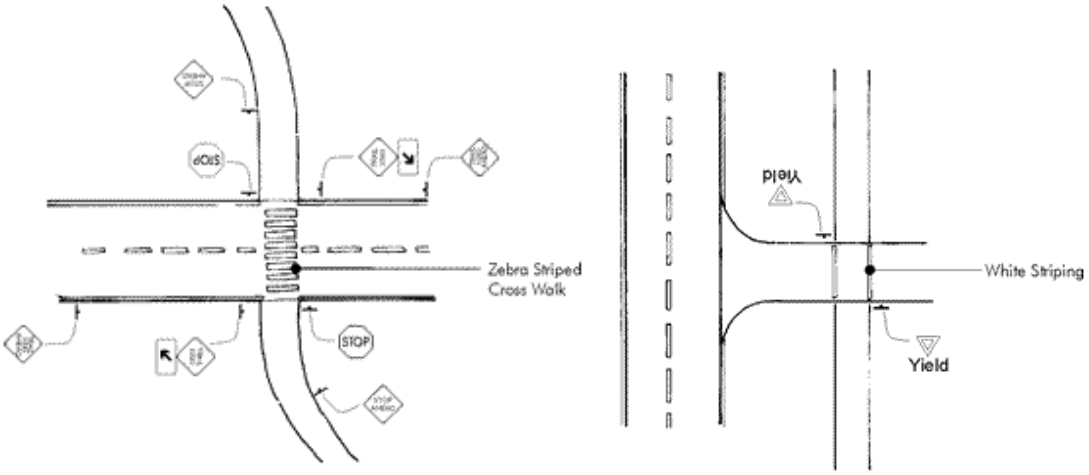
Provide Clear Guidance on the Rules-of-the-Road. Clear guidance through signage and pavement markings as to the rules-of-the-road and rights-of-way needs to be provided for both motorists and trail users. Marking a crosswalk clarifies that a legal crosswalk exists at that location and it indicates to trail users the best place to cross the road. The typical yellow diamond shaped crosswalk signs that are frequently used to indicate the presence of the crosswalk to motorists are not recommended because research has shown that they poorly identify the exact location of the crosswalk and do not explicitly indicate that the motorist is required to yield.



As an alternative, the "Yield to Pedestrians Here" sign, R1-5 of the "Manual of Uniform Traffic Control Devices" is recommended in conjunction with a yield bar. This combination clearly indicates to motorists the need to yield to pedestrians and bicyclists in the crosswalk and the optimum location at which to stop to maximize visibility between crosswalk and roadway users.

Trailway signs at major access points along the trail, including intersections, should indicate the rules of the trail. Pavement markings at the beginning of the trail should notify users of direction of travel and right-of-way regulations. However, pavement markings further along the trail should be minimized to avoid visual clutter.

Allow Clear Visibility between Motorists and Trail Users. The ability of pedestrians to see motorists is equally as important as their own visibility in the roadway. The trail should meet the roadway at as close to a 90-degree angle as possible for maximum visibility. Wide white ladder crosswalk markings are recommended instead of the standard marking of two parallel lines because the ladder crosswalks are more visible and resistant to tire wear.



Yield bars placed ten to twenty feet in advance of the crosswalk on multi-lane roads increase the visibility of pedestrians in the crosswalk from all lanes of traffic. Also, signage placed at the yield bars is less likely to obscure pedestrians than when placed at the crosswalk. Lighting in the area of the crosswalk also helps improve the visibility of trail users to motorists.

Minimize Crossing Distances. Minimizing the distance that pedestrians need to cross the street is a critical safety issue. As crossing distances increase, the comfort and safety of a pedestrian decreases. Refuge islands are an effective method for both increasing visibility and reducing pedestrian crossing distances. Refuge islands are raised areas that separate lanes of opposing traffic and eliminate the need for pedestrians to cross more than one direction of traffic at a time.

Refuge islands allow the pedestrian to undertake the crossing in two separate stages. This increases their comfort level and opens up many more opportunities to safely cross the road. Refuge islands also have the benefit of reducing vehicle delay because more users can cross at gaps. Refuge islands should be added to two lane roadways with heavy traffic and all roadways that have four or more lanes.

Provide Accessible Solutions. Providing accessible options for all users crossing the street is the law. Crosswalk locations that are only identifiable by sight, have blocked sight lines, have short signal timings or signals without accessible information act as barriers to movement for people with visual or mobility impairments. Several treatments of the crosswalk can increase accessibility for impaired users:

- The use of directional curb ramps can guide people with visual impairments to the crosswalk.
- The use of detectable warning strips at the ends of the crosswalks can warn people with visual impairments when they are leaving the sidewalk and entering the roadway.
- Median refuge islands should also include detectable warning strips, curb ramps with a level landing or full cut-trough's at road grade for accessibility.
- Traffic control signals at mid-block locations can be triggered by pedestrians who cannot judge the gaps in traffic or pedestrians with mobility impairments who cannot cross the road in the available gaps.
- Inclusion of audible pedestrian signals that indicate when the pedestrian signal has changed and the traffic has come to a stop prevents a person with a visual impairment from having to discern traffic flow solely through the traffic sounds, which can be difficult at busy intersections and not always reliable.

Including the options listed above in the new crosswalk design makes the pedestrian environment safer for all users. Consistent design treatment of all trail/ road intersections will help users of all abilities feel more comfortable and more able to navigate road crossings. Continuity in design will not only allow pedestrians to feel more at ease, but motorists will also know what to expect and where to be looking.

When railroad crossings are required, the trail should cross at a right angle to the tracks as much as possible. If this 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.
2. On low-speed, lightly-traveled railroad tracks, commercially available flange way fillers can eliminate the gap next to the rail.
3. In some cases, abandoned tracks can be removed.
4. If no other solution is possible, warning signs and pavement markings should be installed.

Surfacing

General design guidelines and cross-sections for typical situations to be considered during the design and implementation of a non-motorized system are set out below.

Crushed fines:

- 3” to 4” of limestone or slag fines material is placed on a 5” to 6” aggregate base.
- Low initial cost but requires frequent maintenance to control erosion and vegetation encroachment
- Coarser aggregate base may be exposed on the surface with erosion and unusual wear requiring rehabilitation every 10 to 15 years
- Works well with walkers, runners and horses
- Slower speeds for bikes
- Makes approaching bicycles more audible to walkers
- Dust from fines can be a maintenance problem for bicycles
- Limestone fines are dustier and take longer to set-up than slag fines.

Asphalt:

- About 3” to 4” of asphalt is placed in two lifts over a 5” to 6” aggregate base
- Moderately long life – can be expanded with surface and crack sealants
- Faster speeds for bikers can be problematic for other users.
- Dark colors leads to pavement heat retention-snow is more likely to melt on asphalt making it a less suitable surface for cross-county skiing
- Asphalt can be plowed in the winter
- Familiar construction techniques
- Issues with run-off pollution especially when first applied.

Resin Pave Bound Material:

- 2” to 4” of fine aggregate bound by a plant based emulsion on a 5” to 6” aggregate
- Does not affect the color of the aggregate – light colored aggregate reduces the heat retaining properties of pavement
- The plant-based resin binder has a similar strength and performance to asphalt.
- Considered a “green” building material – very low run-off problems
- Approximately twice the cost of asphalt

Another option for trail surfacing is the use of plant-based aggregate binder. Resin or powder-based binders are increasingly being used for trail construction. Although the surface of the plant-based fines is smoother than loose fines, it is not an appropriate surface for inline skating.

Stabilized Crushed stone surface:

- Non-toxic organic, colorless and odorless plant-based powder serves as a binding agent.
- For best results aggregate fines and powder are mechanically mixed off-site, placed dry, then hydrated in place
- Surface takes 2-7 days to set, depending on weather
- Prolonged saturation will result in a pliable surface prone to rutting
- Very easy to repair without specialized equipment – mixing on spot for patch jobs
- Considered a "green" building material
- Approximately same cost as asphalt

Hard, all-weather pavement surfaces are usually preferred over those crushed aggregate, sand, clay or stabilized earth. These materials provide a lower level of service and require higher maintenance. However, operating agencies that have chosen crushed aggregate as their surface material have found that they can achieve a completed path in less time and at less cost than with asphalt or concrete.

Asphalt

Concrete

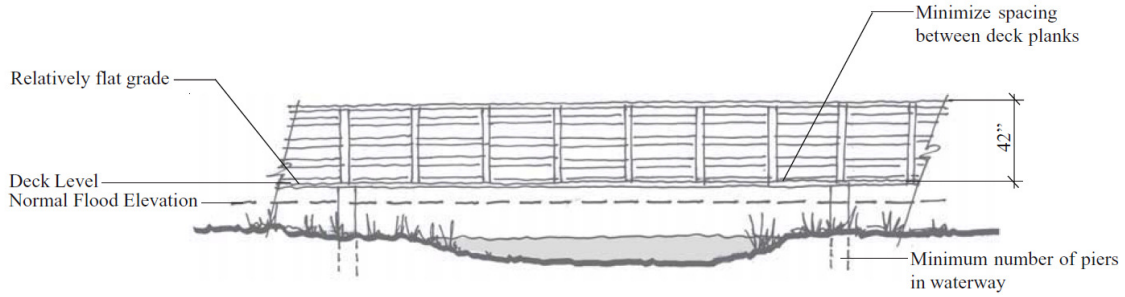
Stone Dust

Designing and selecting pavement sections for shared-use paths is in many ways similar to designing and selecting highway pavement sections. A soils investigation should be conducted to determine the load-carrying capabilities of the native soil, unimproved, shoulder or former railroad bed. Paths should be designed to sustain, without damage, wheel loads of occasional emergency, patrol, maintenance and other motor vehicles expected to use or cross the path. Pavements should be machine laid.

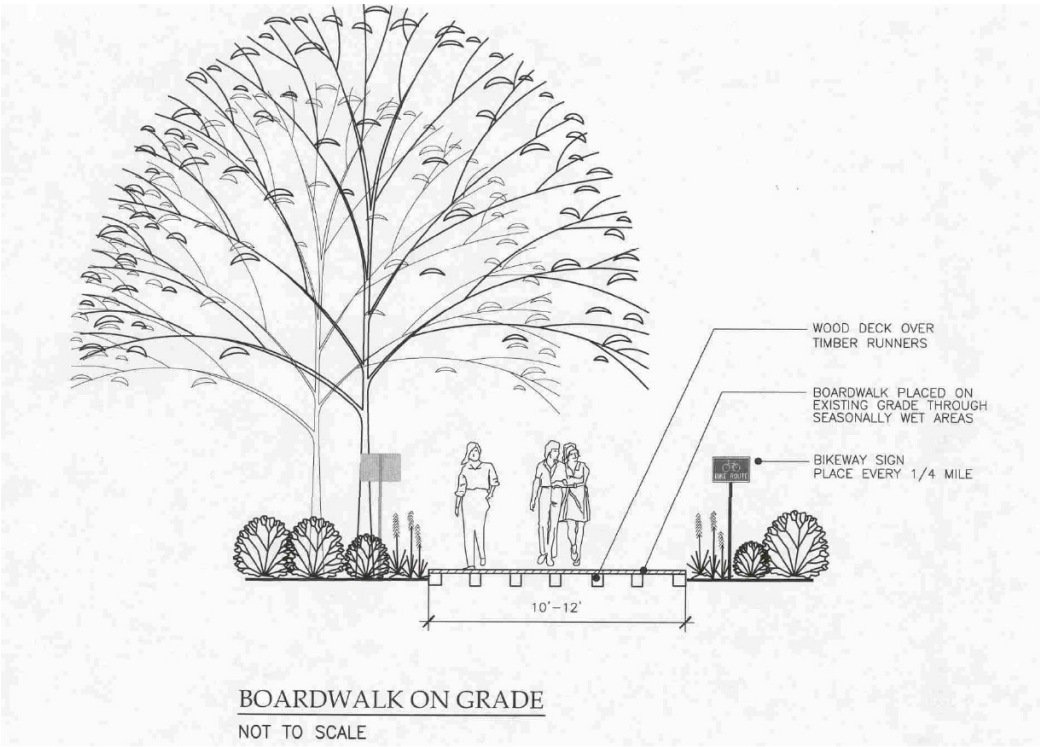
Structures

Structures include special trail surfaces that are needed to cross natural barriers such as wetlands and waterways. Structures often become focal points along the trailway route where users may stop and rest or take in the natural beauty of the area.

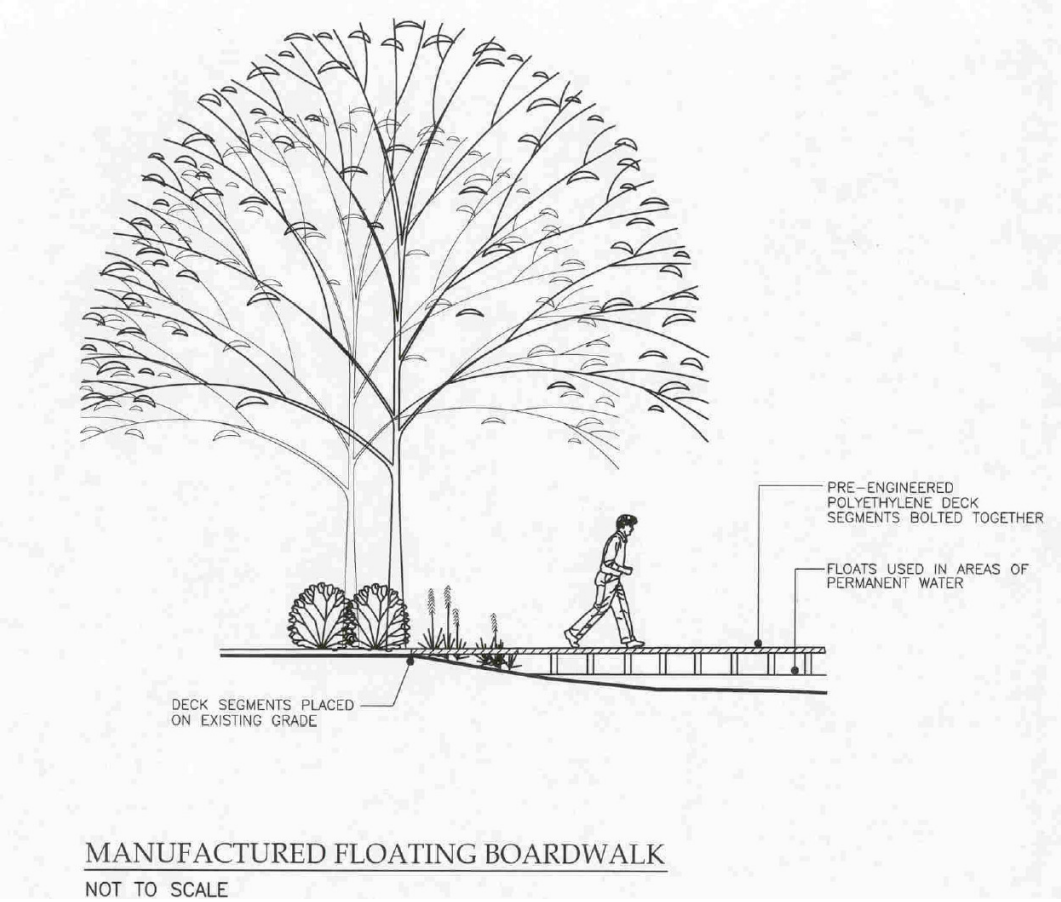
Structures are traditionally the most expensive element of trail construction, thus their use should be limited to keep down the overall cost of trail development. On new structures, the minimum clear width should be the same as the approach trail width. The desirable clear width should include an additional 2-foot wide area on either side, but this may not be possible due to cost considerations.



Elevated Deck - a combination of wooden decking and wooden piles or support piers with a wooden decking trail surface and railings. Railings should meet AASHTO and supports over 3'-6' rubbed smooth. Decking should be laid out at a 45 degree angle to reduce vibrations for wheeled uses. All local and state building codes should be followed.

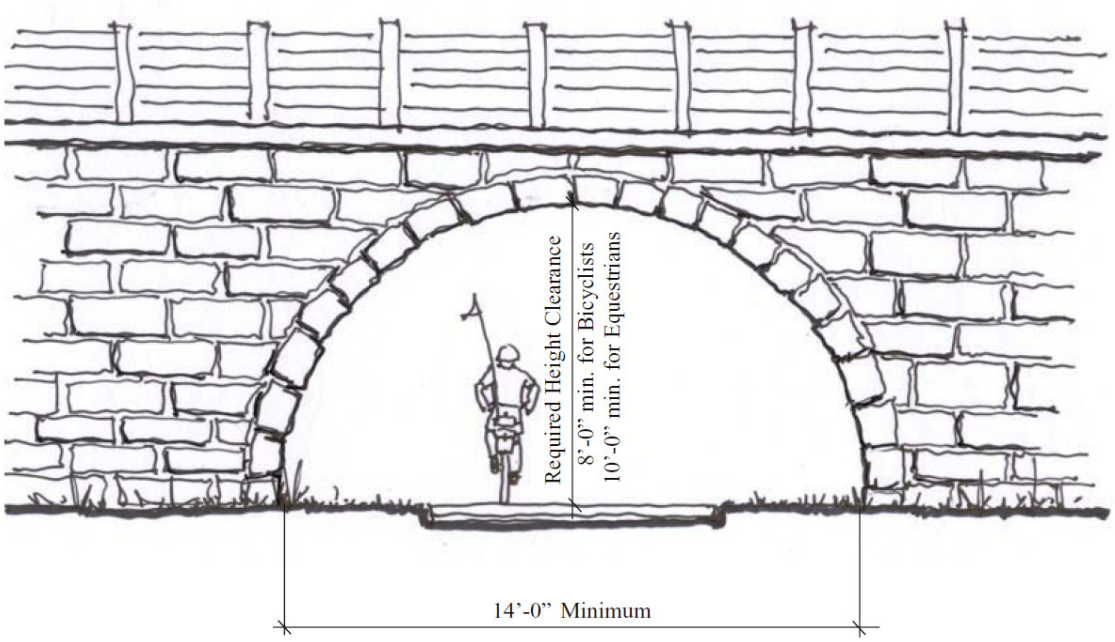


Boardwalk on Grade - in marginally wet areas where boardwalks can be constructed on grade, railings are not required. Such boardwalks are most often recommended for pedestrian-only applications. Decking should be laid out at a 45 degree angle to reduce vibrations for wheeled uses. Additional width is recommended for bicycle use.



Pre-Manufactured Floating Boardwalk - pre-fabricated units that come assembled from the manufacturer may be connected together to form a "floating" boardwalk in areas of permanent water. Recommended without rails only when traversing shallow water and in areas designed for pedestrian use only.

Bridges - for larger bodies of water, ravines or other areas where fill is not permitted, a bridge will be a solution. All bridges will need to be structurally and hydrologically engineered to permit appropriate water flows, withstand major floods, and uphold loading requirements for passage of emergency and trailway maintenance vehicles. The type and design of the bridge used to traverse bodies of water varies based upon the size and the velocity of the water.

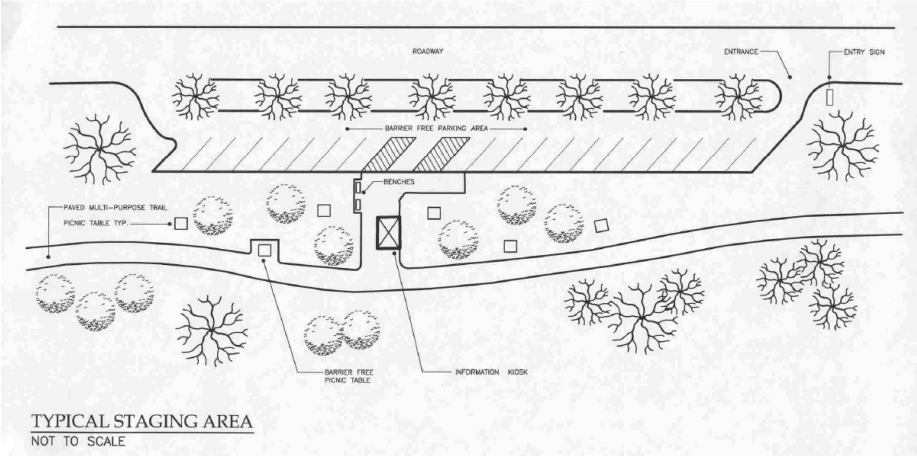


An overpass, underpass, bridge, or facility on a highway bridge may be necessary to provide connectivity and continuity to the developing non-motorized system. For the new structures, the minimum clear width should be the same as the approach paved shared use trail, plus the minimum 2-foot wide clear areas. As an example, a 1-foot wide paved path would require a 14-foot wide bridge to provide the required clearance areas. Access for emergencies should also be considered.

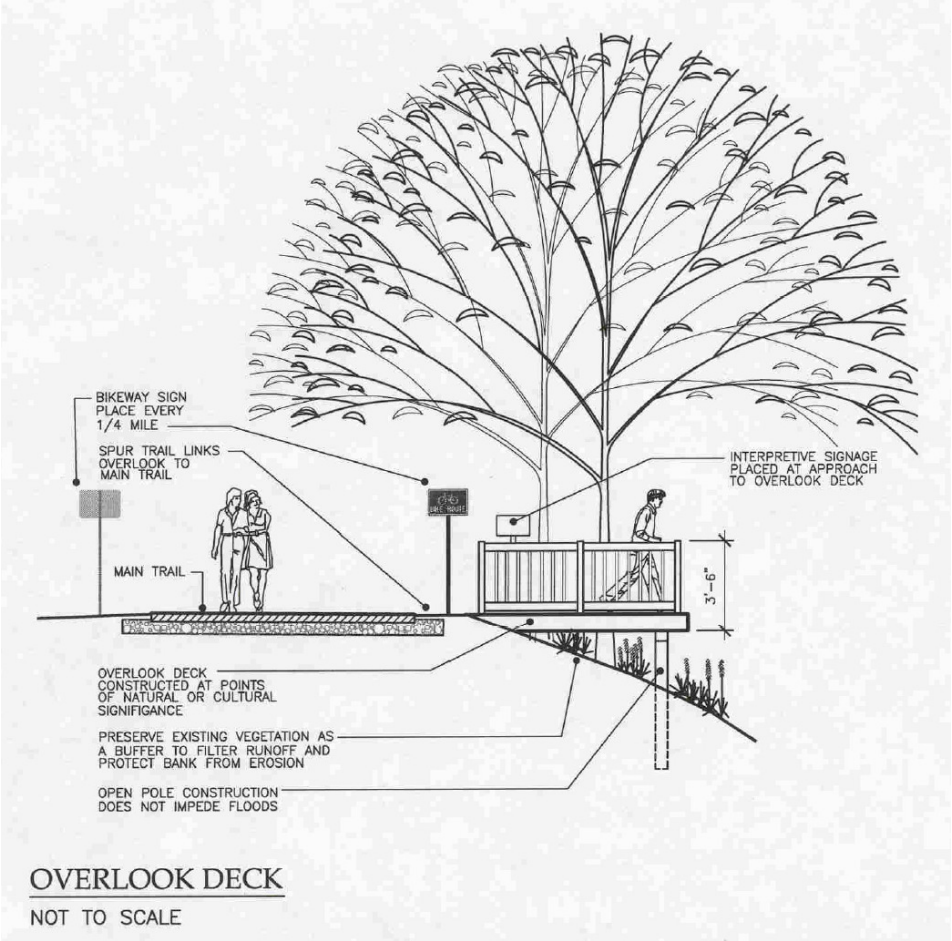
Amenities

The creation of a Trails Master Plan requires more than just locating and constructing linear pathways throughout the community. To make a trails system useable and enjoyable a variety of amenities should be included. The trail segments illustrated on the trails maps do not identify the general location of amenities such as seating areas with benches & trash receptacles, a variety of required and interpretive educational signage and information kiosks, but these things should be kept in mind during the design of each trail segment.

The selection of the style, color and placement of all amenities is part of the detailed work which will be involved in preparation of construction documents, which will be required for each segment of the trail as it moves into the implementation phase of the project.



A staging area is commonly referred to as a trailhead. Elements commonly found in staging areas include parking lot for vehicles, trail information kiosks, picnic area, restrooms and drinking fountains. Staging areas are often located where there are existing facilities to be built upon, such as within a park adjacent to the trailway or other already established areas.



Major Overlooks - Similar to the boardwalks, these decks are proposed to be built in key locations that offer extraordinary views of the county side, rivers, wetlands, or other natural habitats. The major overlooks can include interpretative signage and benches.

Minor Overlooks - minor overlooks can include interpretative signage, fencing and trail furniture. The location of the minor overlooks should occur in areas where only minor vegetative clearing is required.

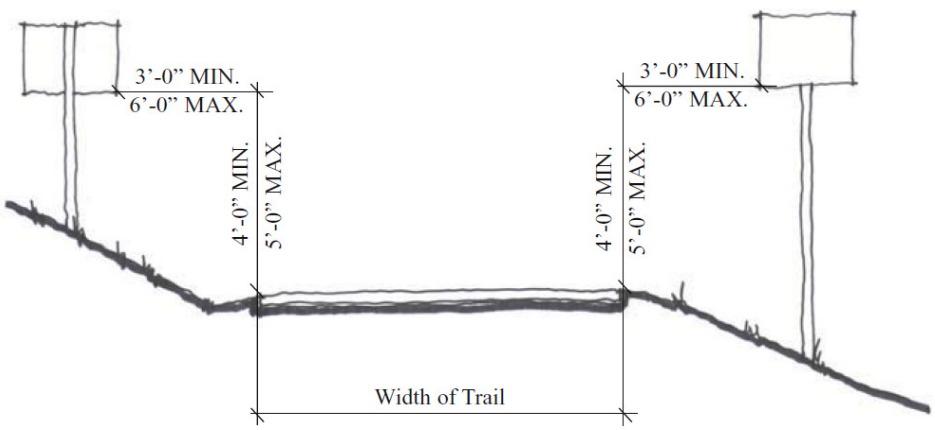
Signage

Signage is an essential element for a successful non-motorized system. While it is assumed that, in most cases, each local entity will design and implement signage for a system segment within its jurisdiction, coordination and some consistency in signage and way-finding will be of utmost importance.

It is suggested that the trails system would promote a trail and bike path wayfinding system that is consistent throughout the region and is customizable to individual trails. Each sign should incorporate the three D's:

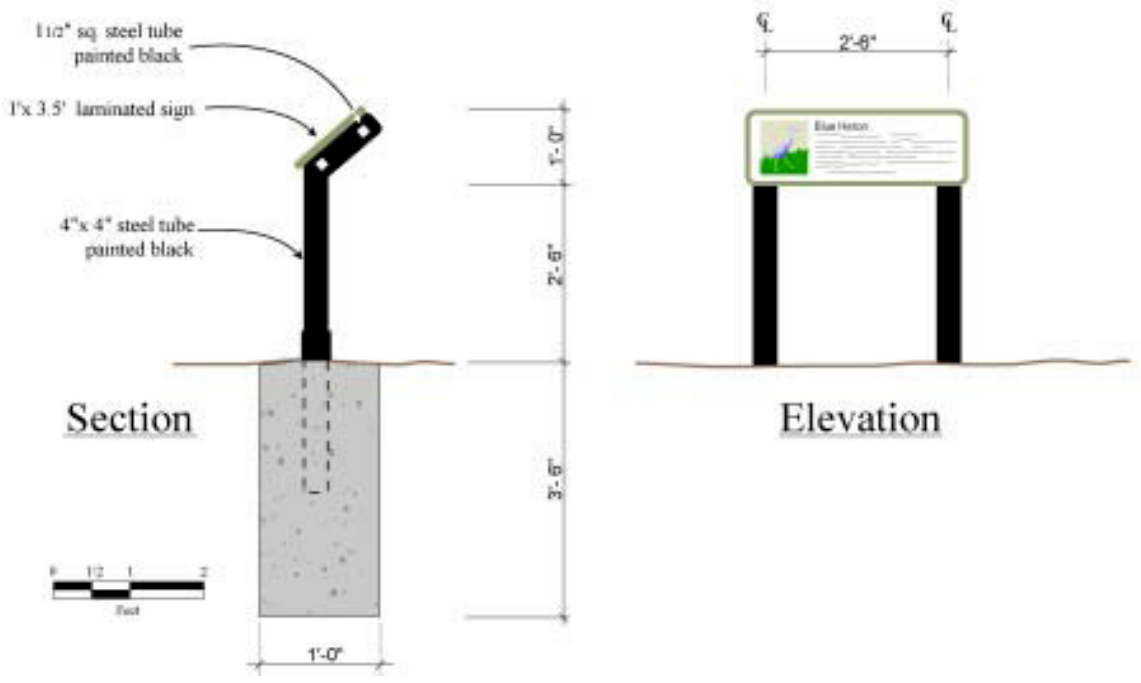
- Distance
- Direction
- Destination

This system fits in with the Federal Highway Administration (FHWA) Manual on Uniform Traffic Control Devices (MUTCD) standards. This signage system is upgradeable and expandable because as a new destination is needed you can simply add it to the sign without printing an entire new sign. It can be used on streets as well as non-motorized trails. Logos for trail or organization can be added above the route marker. This helps with branding the trail and gives recognition to ownership of the trail. Trail names, logos and organizations should be separated from the route and destination signs but on the same post.



There are locations throughout area where bike lanes and trails do not exist and the road is used for bicycle travel. Bicyclists will tell you that motorists need to be reminded that cyclists are legitimate users of the road. Being alerted to their presence at high conflict locations can save lives. One easy, quick, and inexpensive way to improve traffic conditions for bicyclists and motorists is a “Share the Road” sign. These are well suited for the beginning and ending points of bike lanes or trails, popular bike routes, or any place where there is conflict between bicyclists and motor vehicles. “Sharing the road" means that motorists and bicyclists work together to improve on-the-road behavior in terms of courtesy, cooperation and safety.

Interpretive signage can increase people’s knowledge and appreciation of the history of the area. There are many different opportunities for interpretation along the trail. This could include providing interpretation of significant points along the trail such historic sites or ecological and geological phenomena such as native prairie remnants, local animal habitats, or evidence of the glacial history of the area.



Whatever features are chosen for interpretation along the trail, careful and thoughtful use of signage can greatly enhance a user’s experience of the trail. Several important considerations for the design and use of interpretive signage are:

- Keep signage consistent in design along the length of the trail to establish a sense of continuity and character. Repetition of a sign design, color scheme or logo along the trail reinforces the image of a common trail identity through different jurisdictions.

- Signs should be clearly legible, understandable, and be made of fade-proof and weather-proof surface materials and inks.
- Signs should be durable and require minimal maintenance.
- Signs should be placed to prevent obstruction or collision along the trail. Place signs in clear areas at least 4' off the side of the path so groups of pedestrians, wheelchair users or people on bicycles can be completely out of the travel lane while reading signs.
- Self-guided interpretive systems with simple numbered posts may be used along the trail. Trail heads may be used for large interpretive signs that introduce the tour and as a place to distribute self-guided tour pamphlets.

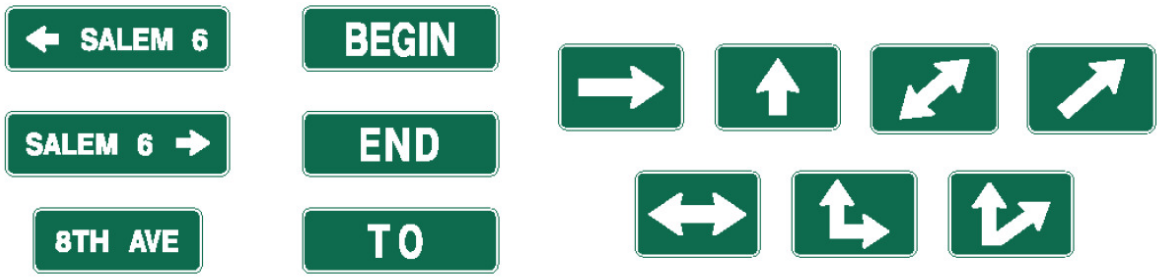
Types of signs

Informational signs:

Informational signs are used to direct and guide users along trails in the most simple and direct manner possible. Signs include, but are not limited to, the following:

- Identification of trailheads and access points
- Identification of cross streets
- Trail maps
- Descriptions of surface type, grade, cross-slope and other trail features

Directional signs:



Directional signs are used to inform trail users where they are along the trail and the distance to destinations and points of interest. They incluse, but are not limited to, the following:

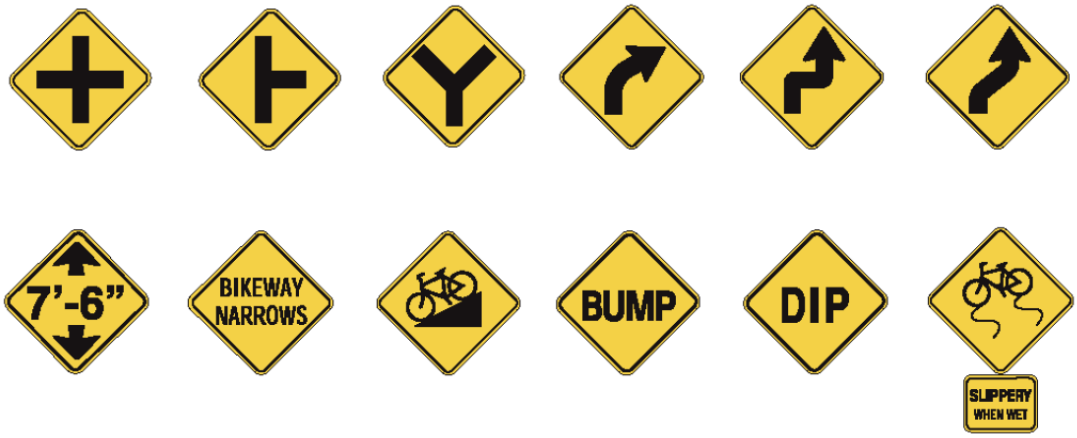
- Street names
- Trail names
- Direction arrows
- Mile markers to be posted every mile
- Mileage to points of interest

Interpretive signs:

Interpretive signs are used to offer educational information on the trail environment. They include, but are not limited to, the following:

- Natural resources
- Cultural resources
- Historic resources
- Other educational resources

Warning signs:



Warning signs are used to alert trail users to potentially hazardous or unexpected conditions. These signs should be used in advance of the condition. They include, but are not limited to, the following:

- Upcoming roadway, railroad, or trail intersections
- Blind curves
- Steep grade
- Height and width constraints

Regulatory signs:

Regulatory signs are used to inform trail users of the "rules of the trail", as well as selected traffic laws and regulations. They include, but are not limited to, the following:

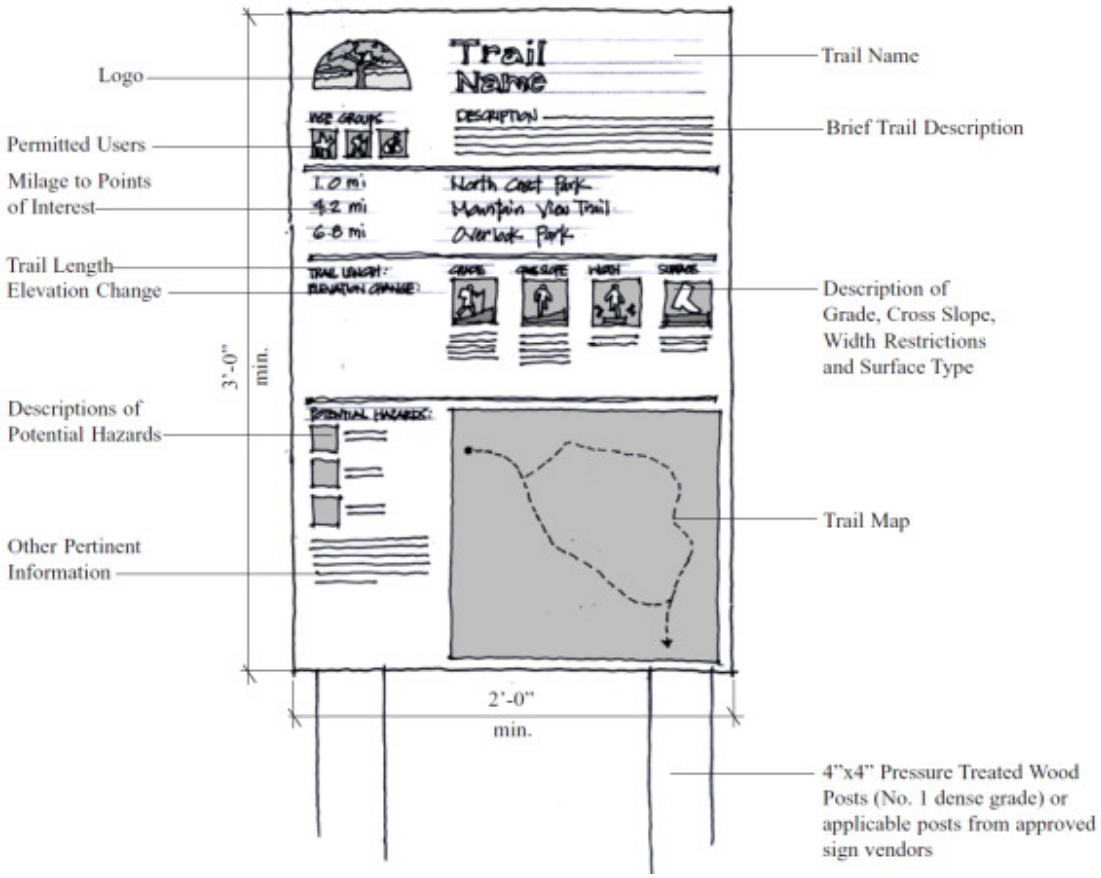
- Appropriate user modes for each trail
- Yield signs for multi-use trails
- Bike speeds
- Controlling direction of travel
- Stop and yield signs

STOP signs shall be installed on shared-use paths at points where bicyclists and other users are required to stop.

YIELD signs shall be installed on shared-use paths at points where bicyclists and other users have an adequate view of conflicting traffic as they approach the sign, and where trail users are required to yield the right-of-way to the conflicting traffic.

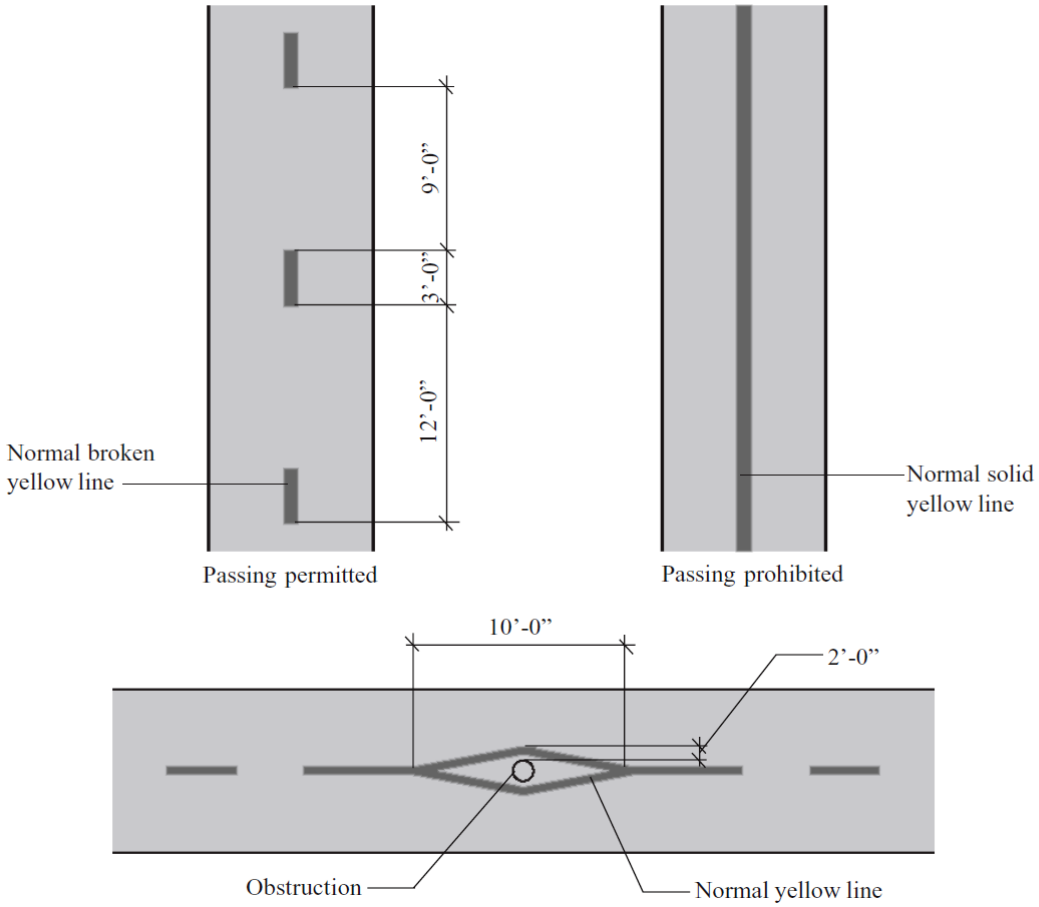
The placement of signs along with each trail will vary greatly, depending on the intended use of the trail, and should comply with the following standards:

- Lateral sign clearance shall be minimum of 3 feet and a maximum of 6 feet from the near edge of the sign to the near edge of the path.
- Mounting height for ground mounted signs shall be a minimum of 4 feet and a maximum of 5 feet measured from the bottom edge of the sign to the near edge of the path surface.
- When overhead signs are used, the clearance from the bottom edge of the sign to the path surface directly under the sign shall be a minimum of 8 feet.
- Placement of signs to be reviewed during trail design review phase.



Informational signs should be provided at each trailhead and major point to convey accurate and detailed information about existing trail conditions and available facilities. This type of sign allows users to accurately assess whether or not a trail meets their personal level of safety, comfort and access. The following information should be conveyed on the sign:

- Trail name
- Brief description of trial
- Permitted users
- Trail map
- Mileage to points of interest
- Trail length
- Elevation change
- Average running grade and maximum grades that will be encountered
- Cross slopes
- Type of surface
- Size, location and frequency of obstacles



Marking and striping indicate the separation of lanes on multi-use trails:

- A solid white line is recommended for separation of pedestrian traffic and bicycle/in-line skating traffic and a dashed yellow line is recommended when adequate sight distance exists
- Solid white lines along the edge of trails are recommended where nighttime riding is expected
- A solid yellow center line is recommended where trails are busy
- Markings should be retroreflective.
- Consideration should be given to selecting pavement marking materials that will minimize loss of traction for bicycles in wet conditions.

Marking and Signs at Intersections (taken directly from MUTCD 2000, Section 9C.01):

- Pavement marking and signs at intersections should tell trail users to cross at clearly defined locations and indicate that crossing traffic is to be expected.
- Similar devices to those used on roadways (stop and yield sign, stop bars, etc.) should be used on trails as appropriate.

- The AASHTO Guide notes that in addition to traditional warning signs in advance of intersections, motorists can be alerted to the presence of a trail crossing through flashing warning lights and striped or colored pavement crosswalks.

Maintenance

Developing maintenance guidelines and standards will be essential in assuring the safety and continued life of the non-motorized system. Repairs may be as minor as fixing a pothole in an asphalt trail or as major as the complete renovation of an entire trail section. Low areas that held or channeled water in the past may begin to deteriorate due to increased runoff from nearby development. If not addressed immediately, these areas can spread and damage large sections of trails.

Routine maintenance tasks are all directed to extending the life expectancy of trails, providing a high quality product to trail users, and ensuring the safety of trail users. Routine maintenance and inspection of the trail system of trail users. Routine maintenance and inspection of the trail system also minimizes repair and renovation costs.

Bikeway and trail maintenance keeps trails at, or near, constructed or intended conditions. Regular maintenance protects the investment of funds, while enhancing user safety, protecting resources and providing continued access to the public. Poorly maintained trails and facilities become unusable and a legal liability.

A maintenance program should be established and adopted by the operating agencies responsible for trail maintenance in order to preserve the trails and facilities, to insure the safety and comfort of trail users, and to maintain a harmonious relationship with adjacent property owners. This would include numerous efforts ranging from mowing and snow removal to replacement of damaged benches and signs to surface repair and reconstruction of the trail.

Every trail should be inspected and evaluated on a regular schedule in order to identify the need for minor or major maintenance repairs. Different types of trails will differ greatly in their maintenance requirements. However, all trails will require a variety of preventative and corrective activities throughout their lives to insure that they remain safe, accessible, and in good condition.

The following recommended maintenance schedule outlines some general guidelines for maintenance activities and the frequency at which they should be performed. The outline provides a general approach to maintaining all types of trails. However, the agency responsible for each trail's operation and maintenance (municipalities, developers, home owners associations, volunteers, etc.) should know best when certain maintenance activities should be performed.

RECOMMENDED MAINTENANCE SCHEDULE

Frequency	Maintenance Activity
As Needed	• Sign replacement • Map or signage updates • Sweeping and brush removal • Trash removal and litter clean-up • Repair or replace trail support amenities such as parking lots, benches, restrooms, etc. • Clearing of vegetation for adequate sight distances • Repair flood damage, such as silt clean-up, culvert clean out, etc. • Patching and minor re-grading • Repaint or repair trash receptacles, benches, signs, and other trail amenities, if necessary
Seasonal	• Mowing • Leaf blowing • Snow plowing or grooming • Planting, pruning and beautification • Culvert clean-out • Installation or removal of seasonal signage
Yearly	• Surface evaluation to determine needed patching, re-grading or installation of waterbars • Evaluate structural integrity of human-built trail features, such as bridges, retaining walls, steps, railings, etc. • Evaluate support services to determine need for repair or replacement • Repaint or repair trash receptacles, benches, signs, and other trail amenities
5-Year	• Sealcoat asphalt trails
10-Year	• Resurface, re-grade and re-stripe trail
20-Year	• Replace or reconstruct trail

Trail users are often the first to experience trail deficiencies and identify needed repairs. Therefore, trail operators are strongly encouraged to establish a spot-improvement program. This program enables trail users to bring deficiencies and problems to the attention of the operating agency in a quick and efficient manner by having pre-addressed, postage-paid postcards available to the public, as well as appropriate telephone numbers

posted along the trail. A timely response from the agency will help to insure safe and accessible trail conditions.

All tree branches extending into the trail clearing should be cut flush with the parent branch or stem, leaving no stubs. This is safer, lasts longer, and also allows for the wound to heal naturally.

Small trees and shrubs within the trailway should be grubbed out to prevent tripping. Holes should be filled and compacted.

Trees and brush outside the trailway (but inside the trail clearing) should be cut as close to the ground as possible, leaving no sharp pointed stumps or stems. Consideration may be given (especially on exotic species) to treating these cut stumps with herbicide.

Fallen branches and trees should be removed except for a few large trees/logs near access points. On larger logs, remove a section only the width of the trailway to further restrict unwanted use.

In high use sections of the trail or near camping areas, dead or dying trees that have a possibility of falling across the trail or camping area should be removed. In primitive areas, only those trees that may be a serious hazard to users should be removed.

When trailway repair is needed, it should be restored to the original design condition, free of loose stones, rock points, stumps, and roots. Attention should be given to dips and outsloping so that water does not collect on the trail.

Proper drainage protects the trail from erosion damage. Trails should be routinely inspected to ensure that all culverts, dips, waterbars, drainage ditches, etc. are free of debris and ready to function properly at all times—especially during the rainy season or spring runoff. Routine maintenance is not only necessary, but valuable in terms of labor, material, and money saved on emergency repairs, and in the number of days the trail is useable. If repairs are necessary, they should meet or exceed the original construction specifications.

Trail and Support Structure Maintenance: The major consideration in structure maintenance is safety. Bridges, stiles, boardwalks and all support structures should be routinely inspected in order to ensure safe conditions and intended function. Deficiencies requiring major efforts should be planned as a separate project. Unsafe structures must not remain unattended. If work must be temporarily deferred, an alternate trail route should provide a bypass of the hazard.

Experience and knowledge of the trail will help determine what tools to take and how many persons to recruit. The most efficient way to manage trail crews goes by various names—the "overseer" system, the "trail sponsor" system, the "adopt-a-trail" system. The key is that one person is responsible for a particular segment of trail on a permanent basis, if

possible. It is his or her responsibility to see that the trail segment is maintained, either working by himself or by recruiting helpers. The advantage of this system is that the adopter becomes well acquainted with the segment, can deal efficiently with problem areas and can judge how much and how often work is needed to keep the segment maintained. A disadvantage of this system is that a segment can become so familiar that problems are overlooked or it becomes boring for the adopter. One way to overcome this problem is to rotate adopters between segments every few years.

The annual trail evaluation or a pre-workday trip by the overseer can serve as an assessment of the work to be done and will facilitate crew organization. Two to four persons can usually maintain 3 to 5 miles of trail per day—depending on the individuals, terrain, vegetation, and the number of maintenance problems.

The exact kind and number of tools for a crew varies from one part of the country to another. In general, tools which are capable of cutting weeds, pruning branches, removing logs, digging and leveling trail, and cleaning waterbars are desirable.

The trail must be cleared of all debris following clearing or heavy maintenance. Maintenance results should appear neat and hardly noticeable to a hiker. Inadequate clean-up can spoil even the most thorough clearing job. One person on the crew should be assigned responsibility for this job. All cut growth should be carried off the trail and scattered—not piled. If eroding gullies are nearby, the cut material can be placed in the gully to slow the flow of water and catch sediment.

All flagging, construction stakes and debris, litter, etc., should be removed.

Work should be organized so every section of trail is left as complete and finished as possible.

Use should be found for as much disturbed material as possible. On every trail there are points where excess material must be removed and sections where material will be needed. Rock and soil removed from a cut on one section can be used as fill on another nearby section. A trail does not have to be worked progressively from beginning to end. Priority should be given to sections needing the most attention. The cut sections may be worked first, followed by the fill areas. Water diversions should be installed prior to trail surfacing work to allow for natural drying and easier working conditions. If two crews are working along the same trail, work assignments and locations should be scheduled to allow for exchange of equipment and materials.

As construction and maintenance is finished in a segment, clean-up should also be completed. Postponing trailside cleanup until later is poor procedure—it seldom gets done. Time should be taken to do the job correctly the first time around to avoid having to repeat the task.

Flagging should be carried for temporary trail marking or to identify work to be done.

A stout but flexible forked sapling (about an inch in diameter at the base) that has been cut about 4 ½ to 5 feet in length (with about a 10" fork at the end) is a very useful tool for flinging small limbs out and away from the trail. When following someone who is using a power brush saw, it is also an excellent tool for flinging the cut brush out of the trail. Used like a pitch fork, it scatters the brush so that it is not visibly concentrated, and is much more efficient than bending to pick up and discard each piece by hand.

All main stems or trunks should be cut as close to the ground as possible—or grubbed out. It is very important to avoid leaving short stubs (trippers) as they are a safety hazard. Cut hardwood stems resprout easily, therefore, grubbing is the preferred method as it is a one-time treatment.

Larger logs should be carried to the downhill side of the trail and placed perpendicular to the face of the hill to prevent them from rolling and creating a safety hazard.

If a branch needs to be pruned, it should be cut next to the trunk. If not cut next to the trunk, these safety hazards tend to develop suckers or side branches which will have to be cut again and look unnatural. Large limbs should be undercut first to prevent peeling the bark from the main stem when the branch falls.

Conifer branches and weak trees, such as alder, are easily broken by heavy snow or rain and may require extra clearing.

Permitting

Permits are necessary for trail and greenway projects. The specific permits that may be required vary greatly depending on the circumstances and location of the project. The specific permits that may be required vary greatly depending on the circumstances and location of the project.

Non-Motorized Design Resources
Guide for the Development of Bicycle Facilities, American Association of State Highway and Transportation Officials (AASHTO), 1999
Manual on Uniform Traffic Control Devices
A Policy on Geometric Design of Highways and Streets "Green Books", 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.
Designing Sidewalks and Trails for Access: Part II Best Practices Design Guide, FHWA.
Universal Access to Outdoor Recreation: A Design Guide, USDA Forest Service.

Implementation

Plan Implementation

This Master Plan is a long term vision for a non-motorized network within Arenac County that can connect with adjoining trails and regional facilities. Implementation of this Master Plan will require extensive effort on behalf of many agencies, departments, organizations, and individuals. Trails of this type cannot be implemented overnight and in many cases portions of this plan may not ever be implemented. This Master Plan is intended to provide an overall vision for the citizens of Arenac County to use as a foundation to reference as they continue to develop plans for road projects, land acquisitions, economic development strategies, resource protection, and other actions. The county should utilize this Master Plan as a tool, and refer to it for the resources and information needed to make decisions on its future needs.

The following actions will assist in furthering implementation efforts for a connected non-motorized system within the Arenac County and Mid-Michigan.

- Local communities and the County should amend Land Use, Transportation, and Recreation Master Plans to include the Arenac County Bicycle and Pedestrian Trails Master Plan. Proposed developments should be designed in a manner that is consistent with the adopted plans for the area or community.

- Raise the level of awareness of the Plan both internally with County staff as well as with local units of government, regional, state and national agencies. Eventual design and construction of the non-motorized corridors will require involvement, cooperation and support of many departments and agencies.

- Develop a coordinated signage and wayfinding plan for the non-motorized system that allows for local flare while providing visual consistency for the user on the entire trail.

- As segments of the system are proposed for construction, it will be necessary to develop a continued and dedicated maintenance program and associated funds. This is imperative to ensure the long-term success of the network.

- A map of the proposed non-motorized system should be updated and published on an annual basis to ensure accurate information is available and to celebrate progress. The Master Plan is intended to be fluid and dynamic. Overtime, it is fully anticipated that the map and plan will be outdated as communities are continuously working to build non-motorized trail segments or alter their local plans based on technical issues, land acquisitions, political agenda, etc.

- Awareness of grant opportunities should remain high. The Authority and the county should pursue funding and grant prospects on a regular basis to advance

those segments of the system that are within their jurisdiction and/or boundaries.

- Incorporate and coordinate non-motorized goals and plans with the Arenac County Road Commission, Michigan Department of Transportation and East Michigan Council of Governments.

Several segments of the planned non-motorized system are within road rights-of-way, or cross over, or under, road rights-of-way. Significant coordination with Michigan Department of Transportation and the Arenac County Road Commission will need to occur on a continual basis to discuss potential for providing space for non-motorized facilities or accommodating non-motorized facilities within planned design and construction projects. This includes rehabilitation and/or replacement of bridges. The Authority and county agencies must stay aware of road rehabilitation, widening and design projects and compare them to proposed non-motorized connections.

There are a number of techniques and methods that communities and agencies across the country have utilized to assist in implementation of a connected, non-motorized system. When public spaces and connections are implemented in a system wide approach, they can provide a central focus for new development, serve as a catalyst for private investment, and contribute to the creation of a coherent framework of open space amenities. As has been described, it is hoped that the county and its municipalities will amend their local plans, ordinances, site plan standards, and policies to incorporate this vision. Coordinating both public and private sector planning of green space and non-motorized systems will ensure a connected system with a multitude of destinations and amenities. Nonmotorized systems and connections should be incorporated at all levels of planning including conceptual planning, site plan review, planned unit developments, cluster development projects, etc. Below are a few strategies to consider:

- Work with developers to encourage the inclusion of pedestrian or non-motorized connections as part of their developments. Ensure the smaller system is connected, or can be linked in the future, to the larger emerging local and regional systems.

  Open space systems can be designed to meet multiple needs including storm water drainage and treatment, wildlife habitat, as well as active and passive recreation. The site's topography, drainage flows, corridors and channels should be used to give structure and form to the overall site plan.

- Work with developers and property owners to discuss the non-motorized vision and associated benefits. Meet with property owners and developers early to discuss voluntary trail easements or dedications of land so that planned segments of the system can be incorporated.

- Develop ordinance language that addresses non-motorized system connectivity and provides guidance and regulations for including and building upon the vision. This can include language for developer provision of easements and development of critical non-motorized segments.

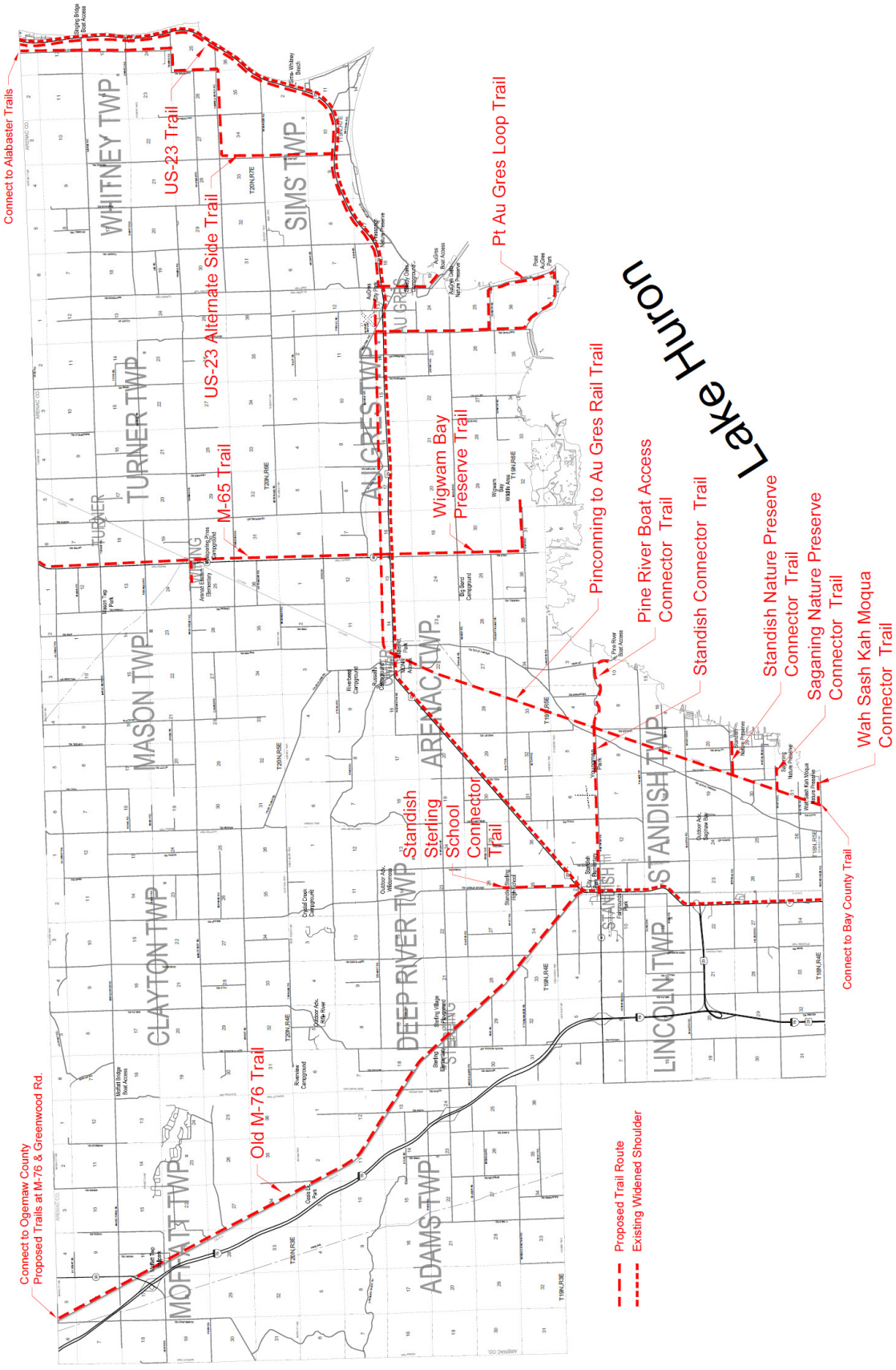
- Non-motorized systems typically have the support of numerous nonprofit organizations that have a demonstrated ability to maintain and construct trails. These groups not only can provide tools, equipment, and labor to supplement government efforts, but can also help by organizing community events, conducting fundraising activities, participating in grant application preparation, and soliciting donations of money, land, or easements from property owners.

Trail Facts

- Once the Clinton River Trail in Oakland County, Michigan was acquired, the Friends of the Clinton River Trail decided to take a long-term view by identifying opportunities all along the corridor for open space and environmental preservation. They formed a Clinton River Land Vision Task Force in 2003, inviting citizens and environmental leaders in the area to draft a guiding vision for the future. In 2006, a land preservation millage was passed to help fund land preservation according to the established vision. The trail sparked citizens to be involved in an additional project for the good of the community.
- A study documented in the September 5, 2006 issue of Science, found that plant diversity in natural areas connected by corridors compared to natural areas that were unconnected had 20 percent more species of plants.
- In trail way studies conducted by Michigan State University on the Pere Marquette, TART, Leelanau, Lansing River Trail, and Paint Creek Trail, at least half of all trail users accessed the trail by means other than driving to it. This reinforces the theory that trails are used most often by those who find it easiest to get there. As such, regional trail networks and on-road connections to non-motorized facilities would be beneficial.
- An April, 2003 study for the Surface Transportation Policy Project, using a national telephone survey of 800 randomly sampled adults 18 and older, found that 55% of adults would like to walk more throughout the day either for exercise or to get to specific places.

As was previously mentioned, this Master Plan represents a long-term vision that may well not be fully implement for 20 to 30 years because of a variety of factors including funding, feasibility, public involvement, and political and community priorities. Therefore, a hierarchy of trails segments should be developed so that implementation of priority segments are first to be developed and lower priority segments are placed on the back burner. Implementation of any segment of this Master Plan is a step towards the goals of the plan and should be considered favorably if the opportunity presents itself. Primary routes where higher density populations are present should be considered high priorities.

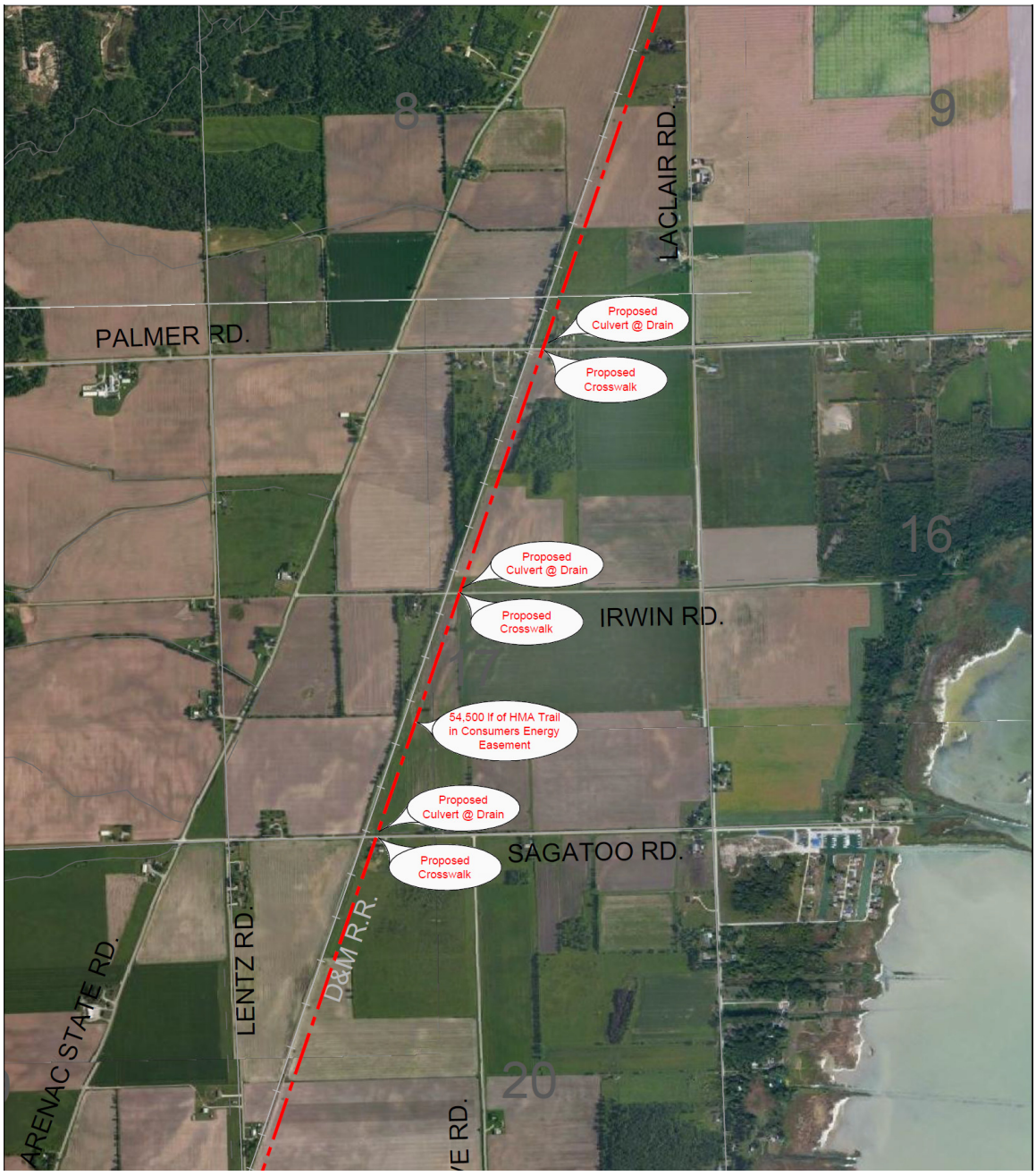
The planning of the network is an ongoing effort both at the local and county level of government. A major consideration during the planning for the implementation phase of the Master Plan is cost. Cost will influence the type of materials, the construction and the phasing of the improvements and the potential funding sources. This section of the Master Plan provides probable costs for implementation. The costs are derived from a variety of sources and are intended to illustrate the magnitude of costs and estimates for the purpose of capital expenditure planning by local communities and interest groups. The costs indicated are a starting point in planning for the cost of implementation. More detailed engineering design, analyses and site-specific design will be needed prior to funding requests being submitted.

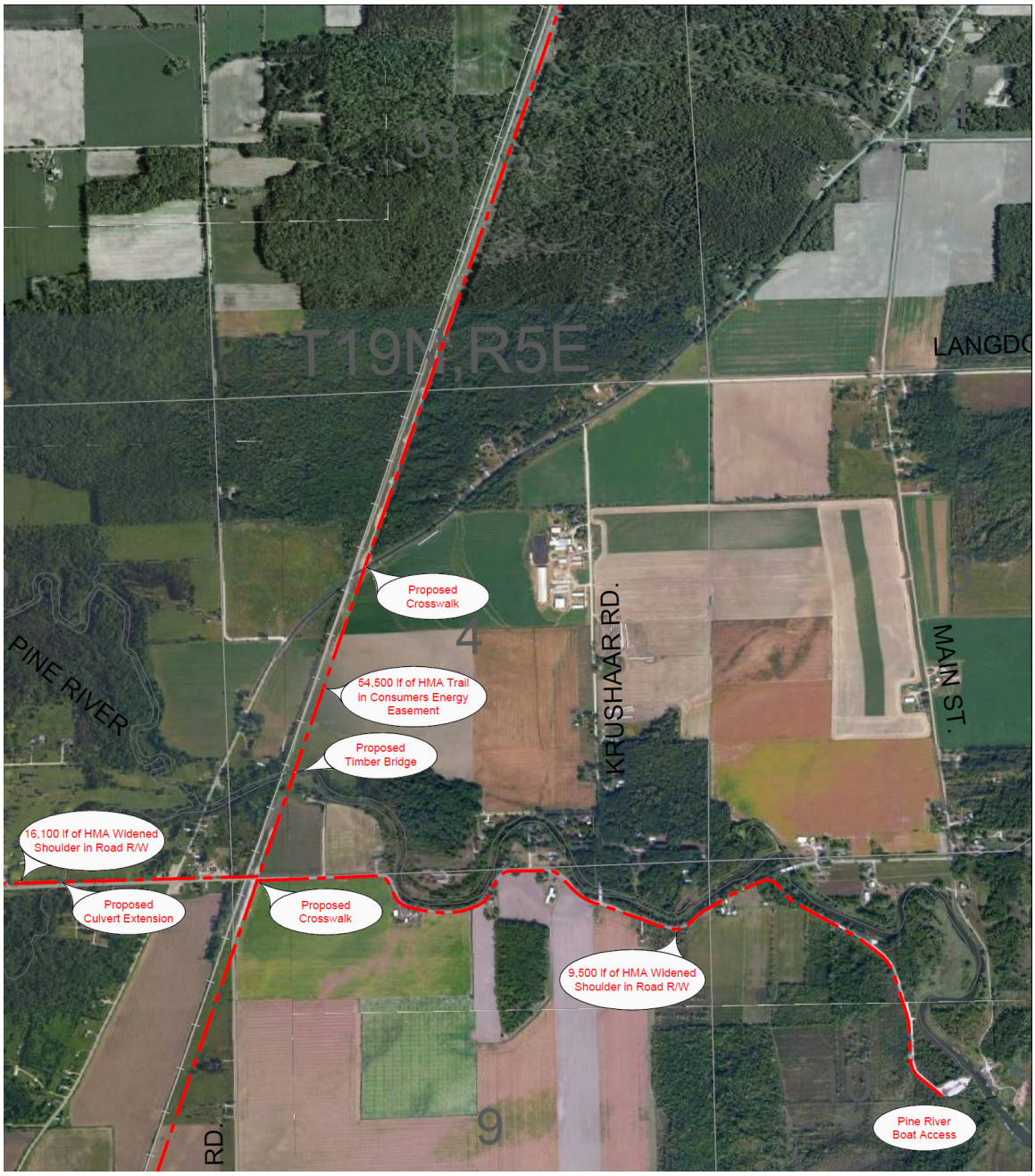

Connect to Alabaster Trails
WHITNEY TWP
US-23 Trail
US-23 Alternate Side Trail
SIMS TWP
Pt Au Gres Loop Trail
Lake Huron
TURNER
TURNER TWP
M-65 Trail
AU GRES TWP
Wigwam Bay Preserve Trail
Pinconning to Au Gres Rail Trail
MASON TWP
ARENAC TWP
Pine River Boat Access Connector Trail
Standish Connector Trail
Standish Nature Preserve Connector Trail
Saganing Nature Preserve Connector Trail
Wah Sash Kah Moqua Connector Trail
CLAYTON TWP
DEEP RIVER TWP
Standish Sterling School Connector Trail
STANDISH TWP
LINCOLN TWP
Connect to Bay County Trail
Old M-76 Trail
MOFFATT TWP
ADAMS TWP
Connect to Ogemaw County
Proposed Trails at M-76 & Greenwood Rd.
Proposed Trail Route
Existing Widened Shoulder

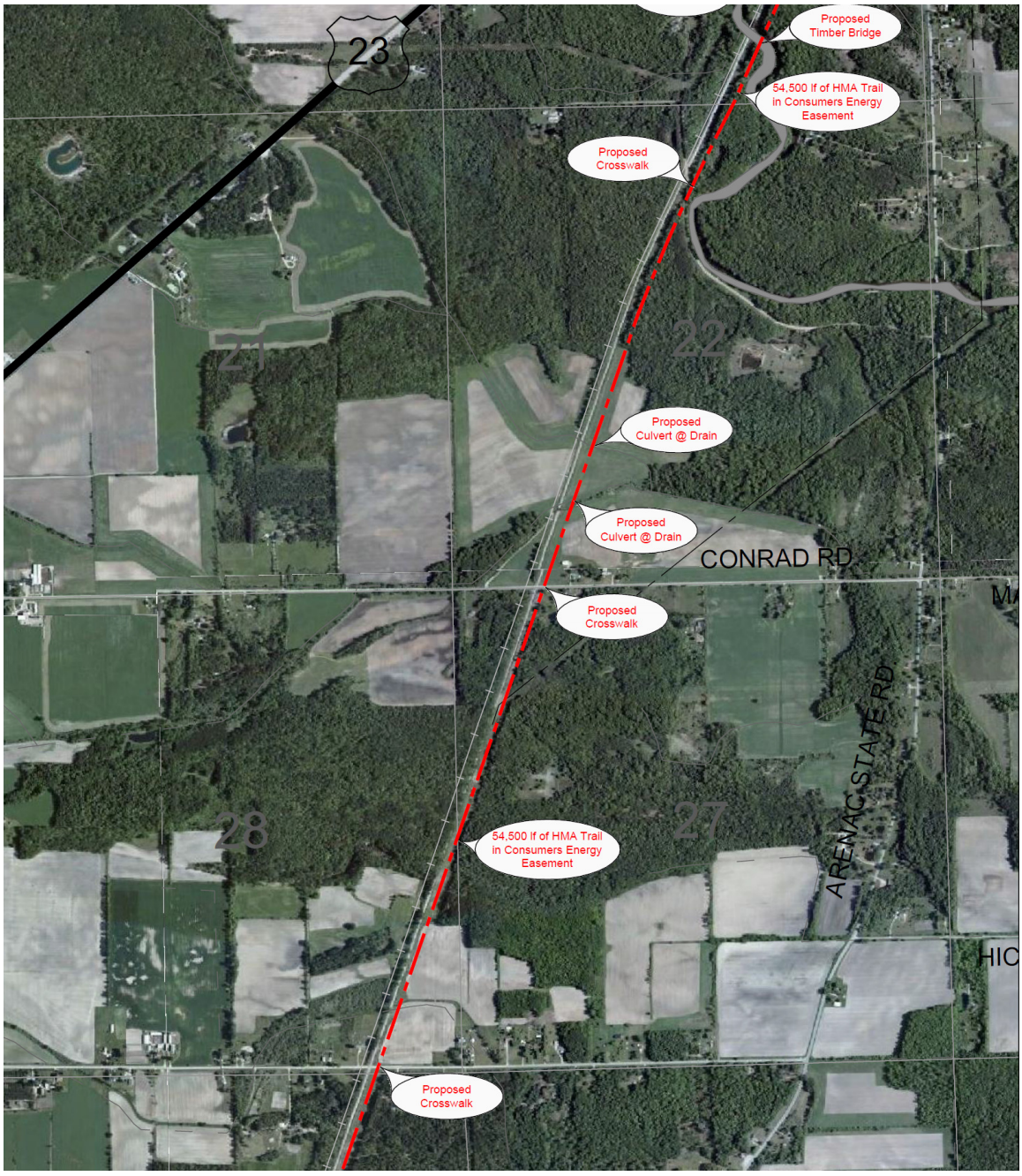
PROPOSED TRAIL SEGMENTS AND DESCRIPTIONS

PINCONNING TO AU GRES RAIL TRAIL

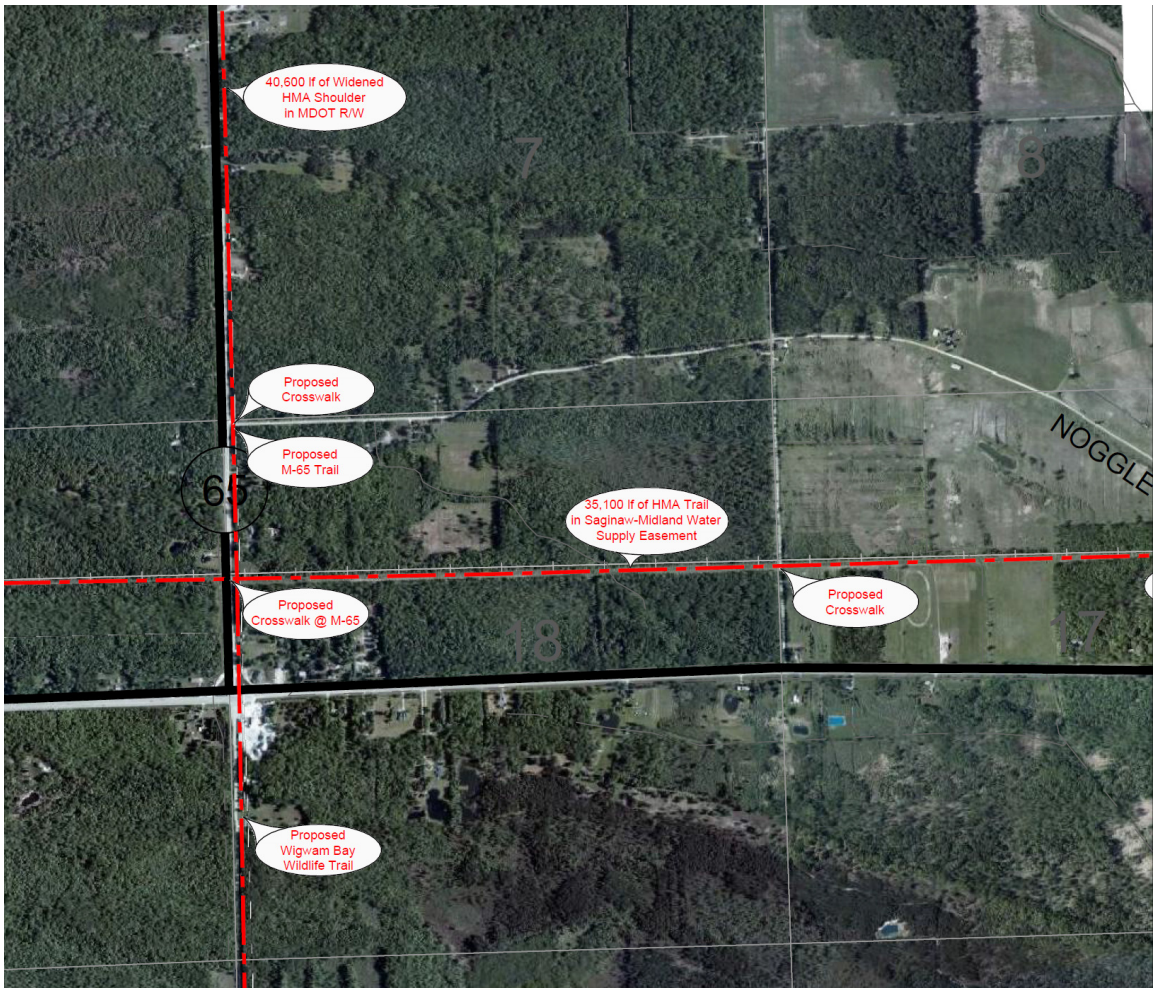
The Pinconning to Au Gres Rail Trail will follow the former Michigan Central rail road grade across Arenac County from the Bay County line on the south north to Omer and then east to the City of Au Gres within the old rail road grade that is now owned by Saginaw-Midland Municipal Water Supply Corporation.


PALMER RD.
LACLAIR RD.
Proposed Culvert @ Drain
Proposed Crosswalk
Proposed Culvert @ Drain
Proposed Crosswalk
IRWIN RD.
54,500 lf of HMA Trail in Consumers Energy Easement
Proposed Culvert @ Drain
Proposed Crosswalk
SAGATOO RD.
D&M R.R.
LENTZ RD.
ARENAC STATE RD.
8
9
16
20

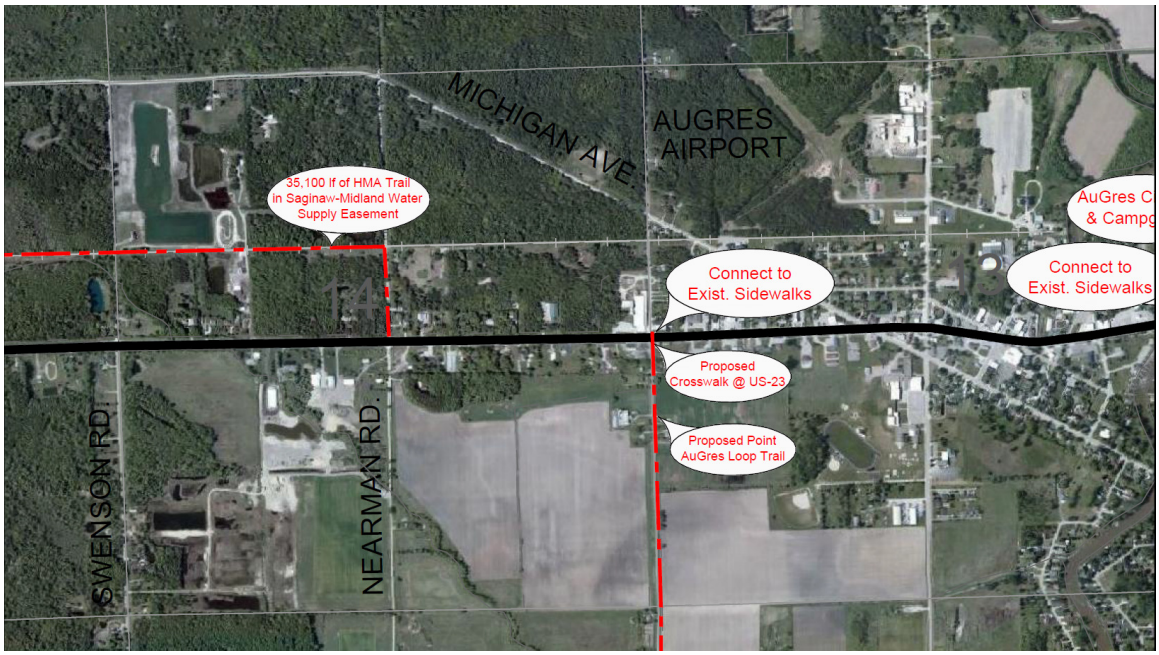

33
T19N,R5E
LANGDO
PINE RIVER
Proposed Crosswalk
4
54,500 lf of HMA Trail in Consumers Energy Easement
Proposed Timber Bridge
KRUSHAAR RD.
MAIN ST.
16,100 lf of HMA Widened Shoulder in Road R/W
Proposed Culvert Extension
Proposed Crosswalk
9,500 lf of HMA Widened Shoulder in Road R/W
9
RD.
Pine River Boat Access


23
Proposed Timber Bridge
54,500 lf of HMA Trail in Consumers Energy Easement
Proposed Crosswalk
21
22
Proposed Culvert @ Drain
Proposed Culvert @ Drain
CONRAD RD
Proposed Crosswalk
ARENAC STATE RD
28
27
54,500 lf of HMA Trail in Consumers Energy Easement
Proposed Crosswalk


35,100 lf of HMA Trail in Saginaw-Midland Water Supply Easement
14
13
Proposed Crosswalk @ US-23
State Road Park
Proposed Timber Bridge
54,500 lf of HMA Trail in Consumers Energy Easement


40,600 lf of Widened HMA Shoulder in MDOT R/W
7
8
Proposed Crosswalk
Proposed M-65 Trail
65
NOGGLE
35,100 lf of HMA Trail in Saginaw-Midland Water Supply Easement
Proposed Crosswalk
Proposed Crosswalk @ M-65
18
17
Proposed Wigwam Bay Wildlife Trail


LENTNER RD.
NOGGLE RD.
E RD.
Proposed Crosswalk
Proposed Culvert @ Drain
35,100 lf of HMA Trail in Saginaw-Midland Water Supply Easement
Proposed Crosswalk
Proposed Crosswalk
Proposed Crosswalk
23


MICHIGAN AVE
AUGRES AIRPORT
35,100 lf of HMA Trail in Saginaw-Midland Water Supply Easement
AuGres C & Campg
Connect to Exist. Sidewalks
Connect to Exist. Sidewalks
Proposed Crosswalk @ US-23
Proposed Point AuGres Loop Trail
SWENSON RD.
NEARMAN RD.

Pinconning to Au Gres Rail Trail

HMA Pathway (89,600 lf from County Line to Au Gres)	$1,200,000.00
Timber Bridge @ Saganing River	$75,000.00
Timber Bridge @ Pine River	$125,000.00
Timber Bridge @ Rifle River	$150,000.00
Minor Crosswalks (20 @ County Roads)	$50,000.00
Major Crosswalks (2 @ State Highways)	$30,000.00
Culvert Crossings (10)	$75,000.00
Easement Acquisitions, Legal Fees, etc.	$25,000.00
Engineering	$170,000.00
Contingency	$100,000.00
Total Trail Costs	**$2,000,000.00**

Wah Sash Kah Moqua Connector Trail

HMA Widened Shoulder (3,500 lf)	$85,000.00
Signage & pavement Markings	$10,000.00
Engineering	$9,000.00
Contingency	$16,000.00
Total Trail Costs	**$120,000.00**

Saganing Nature Preserve Connector Trail

HMA Widened Shoulder (2,950 lf)	$75,000.00
Signage & pavement Markings	$10,000.00
Engineering	$9,000.00
Contingency	$16,000.00
Total Trail Costs	**$110,000.00**

Standish Nature Preserve Connector Trail

HMA Widened Shoulder (4,150 lf)	$100,000.00
Signage & pavement Markings	$10,000.00
Engineering	$9,000.00
Contingency	$16,000.00
Total Trail Costs	**$135,000.00**

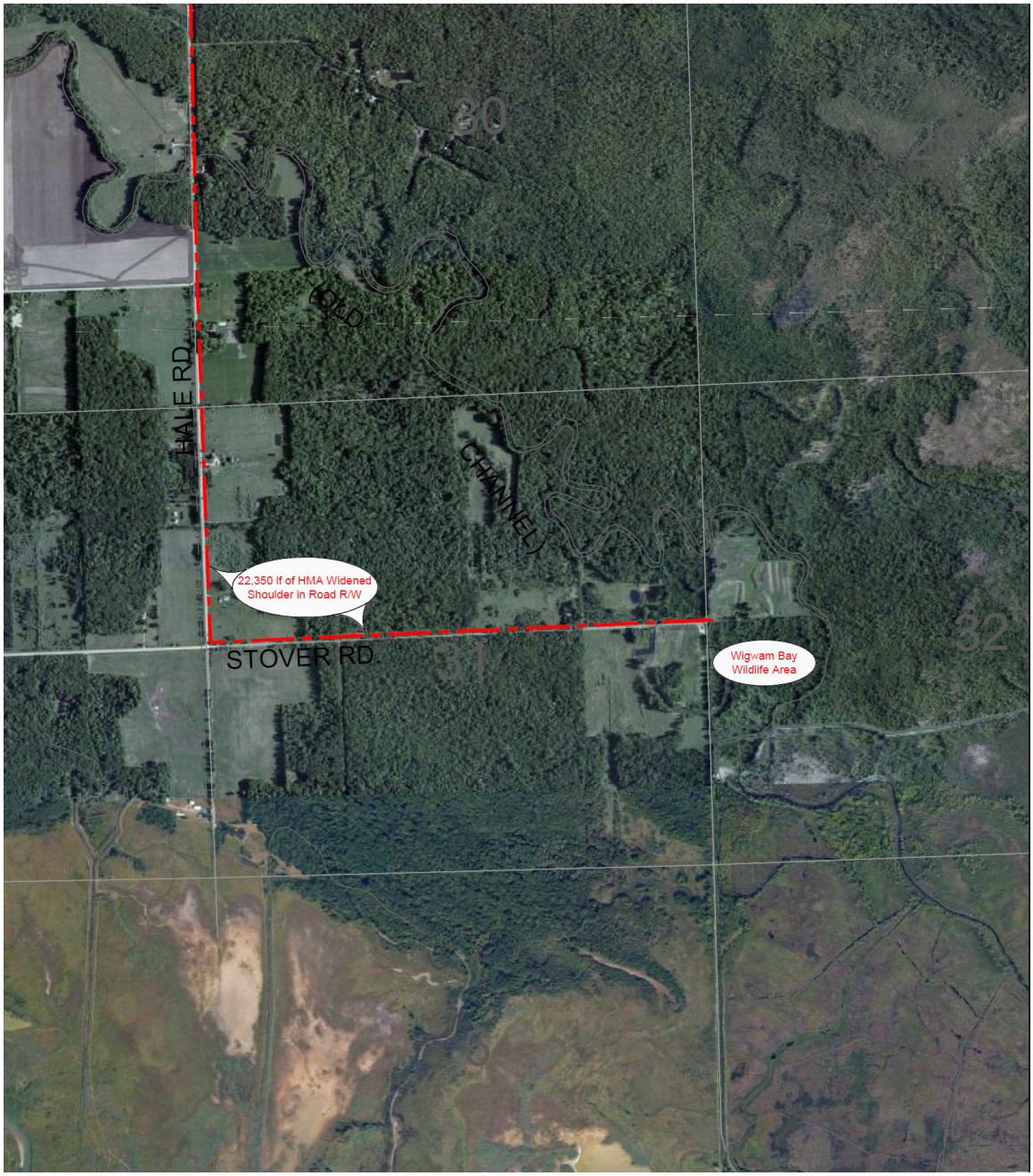
Pine River Boat Access Connector Trail

HMA Widened Shoulder (9,500 lf)	$200,000.00
Signage & pavement Markings	$20,000.00
Engineering	$20,000.00
Contingency	$20,000.00
Total Trail Costs	**$260,000.00**

WIGWAM BAY WILDLIFE TRAIL

The Wigwam Bay Wildlife Trail is proposed to follow existing roadways along the shoulders from US-23 south along Hale Road to Stover Road then east along Stover Road to the Wigwam Bay Wildlife area.


Proposed M-65 Trail
94,800 lf of HMA Trail in Consumers Energy Easement
Proposed Crosswalk
Proposed Crosswalk @ M-65
Proposed Wigwam Bay Wildlife Trail
22,350 lf of HMA Widened Shoulder in Road R/W
65
13
18
24
19
20

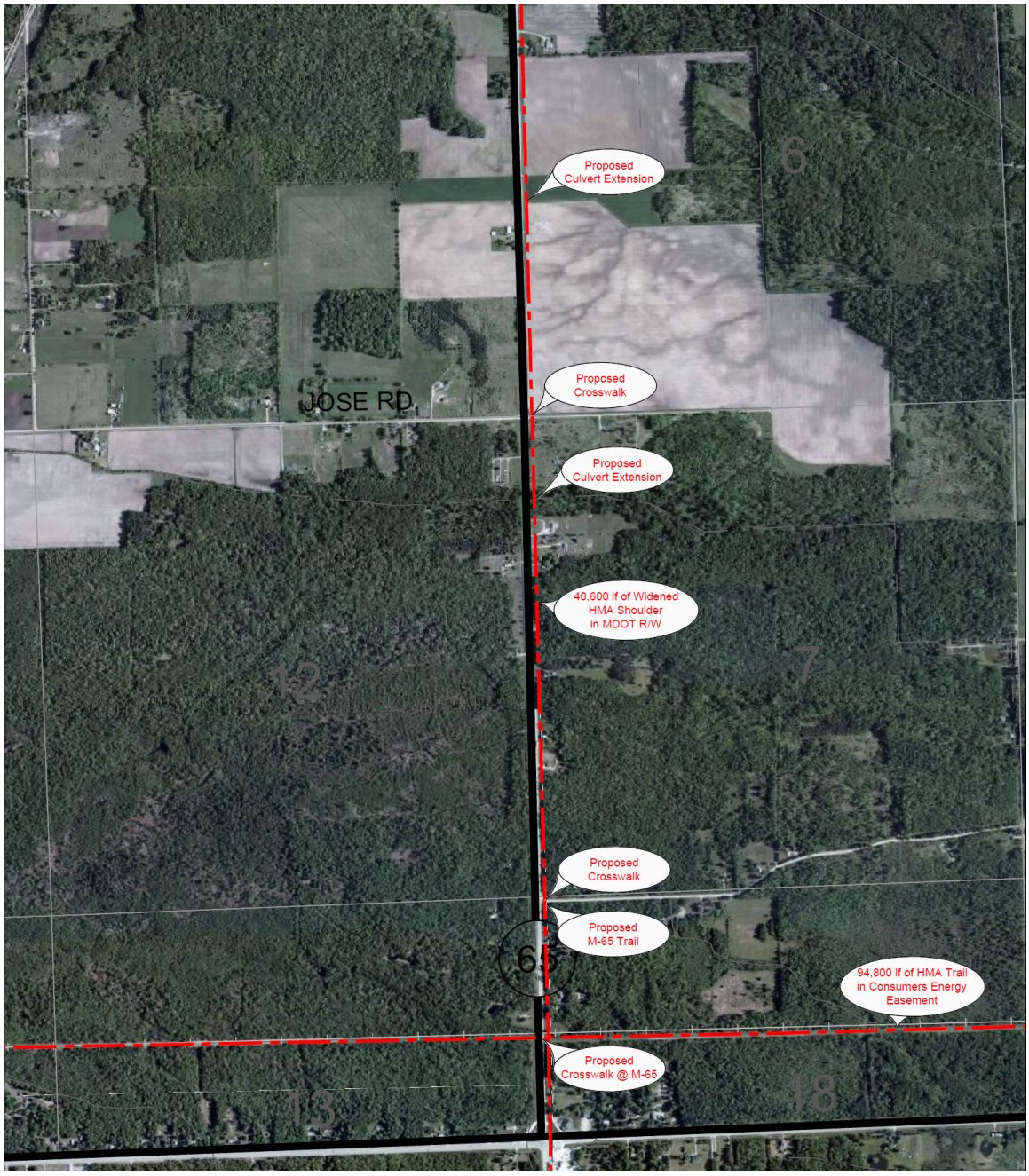


Wigwam Bay Wildlife Trail

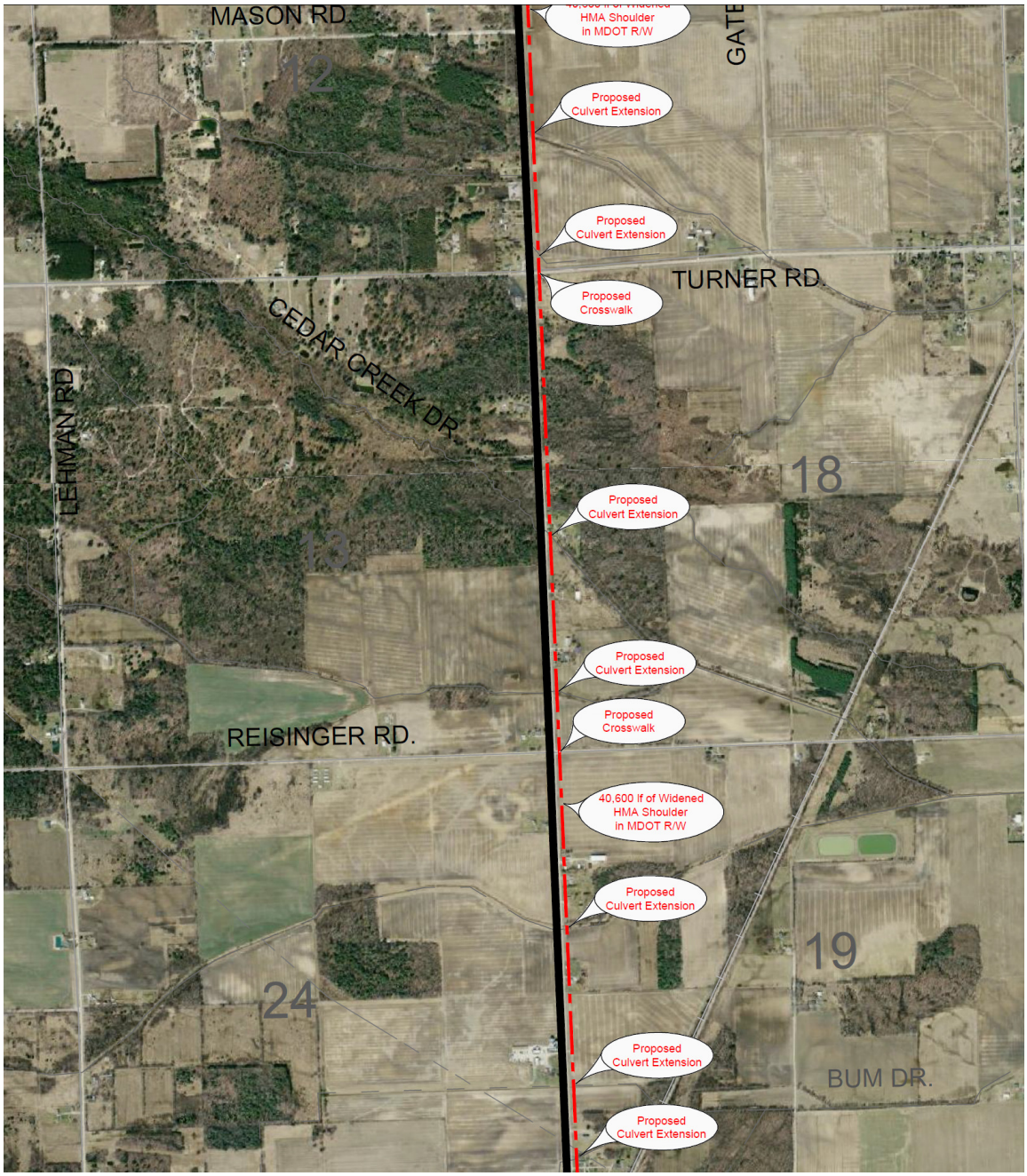
HMA Widened Shoulder (22,350 lf)	$550,000.00
Signage & pavement Markings	$50,000.00
Engineering	$70,000.00
Contingency	$80,000.00
Total Trail Costs	**$750,000.00**

M-65 TRAIL

The M-65 Trail will follow the M-65 corridor along widened shoulders from the intersection of US-23 north to the Iosco County line. This trail will connect to the existing sidewalks in Twinning to the Arenac Eastern School.




Existing Sidewalk to Arenac Eastern
Existing Sidewalks
Proposed Culvert Extension
65
30
25
Proposed Culvert Extension
TOWNSEND RD.
Proposed Crosswalk
D&M R.R.
40,600 lf of Widened HMA Shoulder in MDOT R/W
36
OSTRANDER RD.
31
CRAWFORD RD.
Proposed Culvert Extension
D.

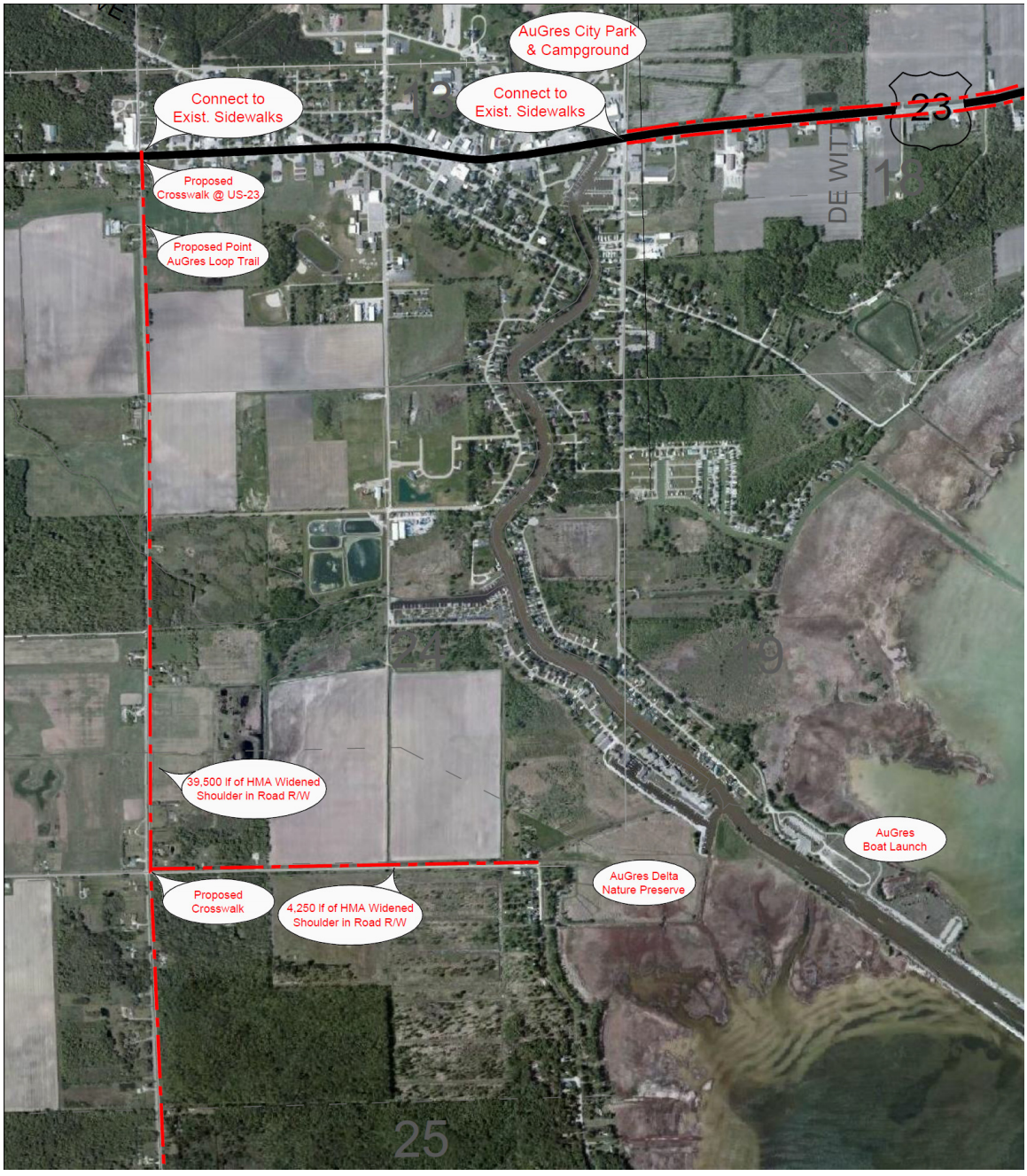

MASON RD.
12
HMA Shoulder
in MDOT R/W
Proposed
Culvert Extension
Proposed
Culvert Extension
TURNER RD.
Proposed
Crosswalk
CEDAR CREEK DR.
LEHMAN RD
18
Proposed
Culvert Extension
13
Proposed
Culvert Extension
Proposed
Crosswalk
REISINGER RD.
40,600 lf of Widened
HMA Shoulder
in MDOT R/W
Proposed
Culvert Extension
19
24
Proposed
Culvert Extension
BUM DR.
Proposed
Culvert Extension

M-65 Trail

HMA Widened Shoulder (40,600 lf)	$1,100,000.00
Signage & pavement Markings	$100,000.00
Minor Crosswalks (5 @ County Roads)	$15,000.00
Culvert Extensions (13)	$75,000.00
Easement Acquisitions, Legal Fees, etc.	$10,000.00
Engineering	$130,000.00
Contingency	$70,000.00
Total Trail Costs	**$1,500,000.00**

POINT AU GRES LOOP TRAIL

The Point Au Gres Loop Trail will provide connectivity from US-23 to Au Gres Delta Nature Preserve, the Au Gres Boardwalk, and the Point Au Gres County Park and Campground. This trail segment will be built as widened shoulders along county roads. Beginning going south along Santiago Road from US-23 thence continuing along Booth Road to Rumsey Road. Then north along Rumsey Road to Gordon Road westerly back to Santiago Road. Also, a connector trail along Manor Road will connect the Au Gres Delta Nature Preserve.



Point Au Gres Loop Trail

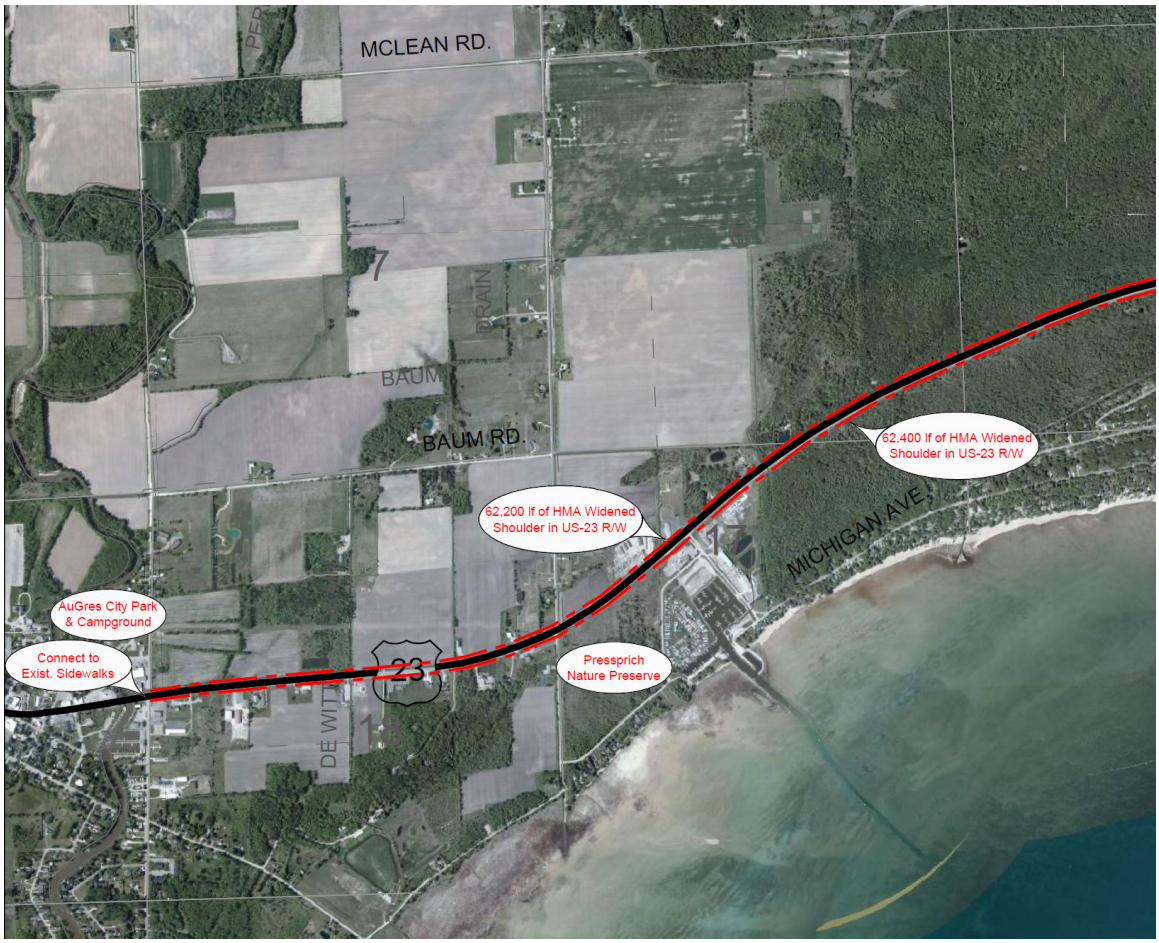
HMA Widened Shoulder (39,500 lf)	$1,000,000.00
Signage & pavement Markings	$75,000.00
Minor Crosswalk (2 @ County Roads)	$10,000.00
Engineering	$150,000.00
Contingency	$125,000.00
Total Trail Costs	**$1,360,000.00**

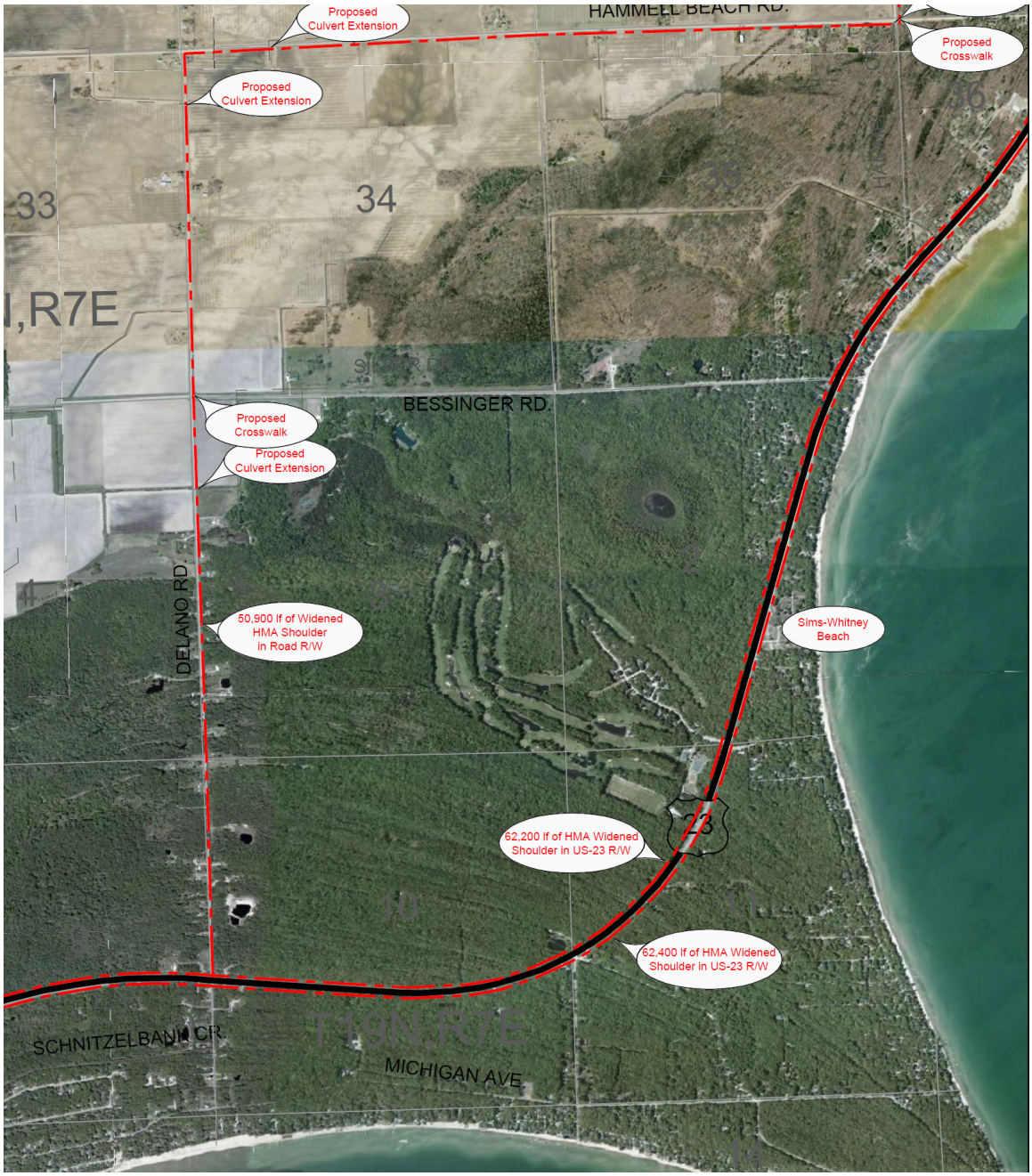
Au Gres Delta Nature Preserve Trail

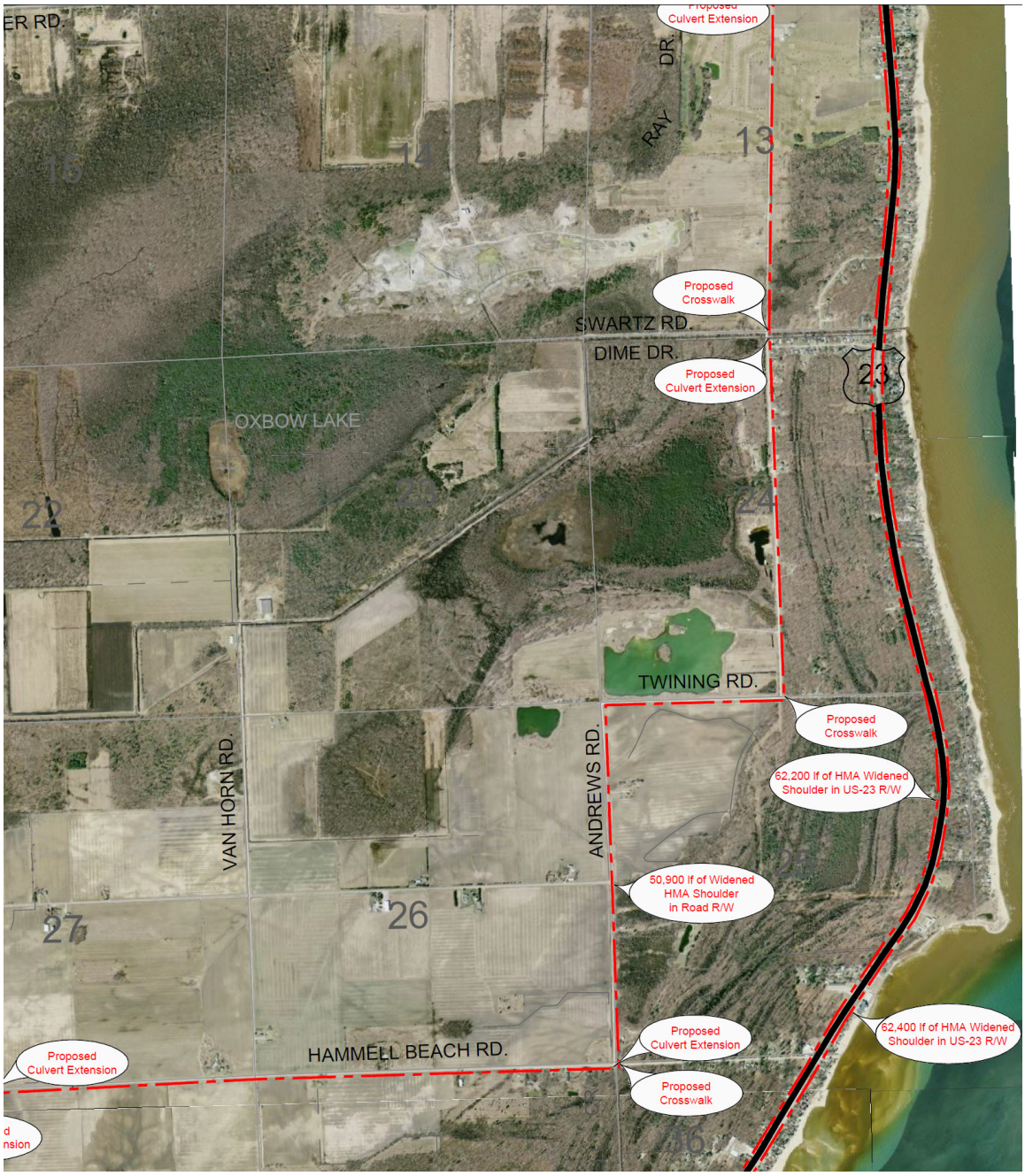
HMA Widened Shoulder (4,250 lf) $100,000.00
Signage & pavement Markings $10,000.00
Engineering $9,000.00
Contingency $16,000.00
Total Trail Costs $135,000.00

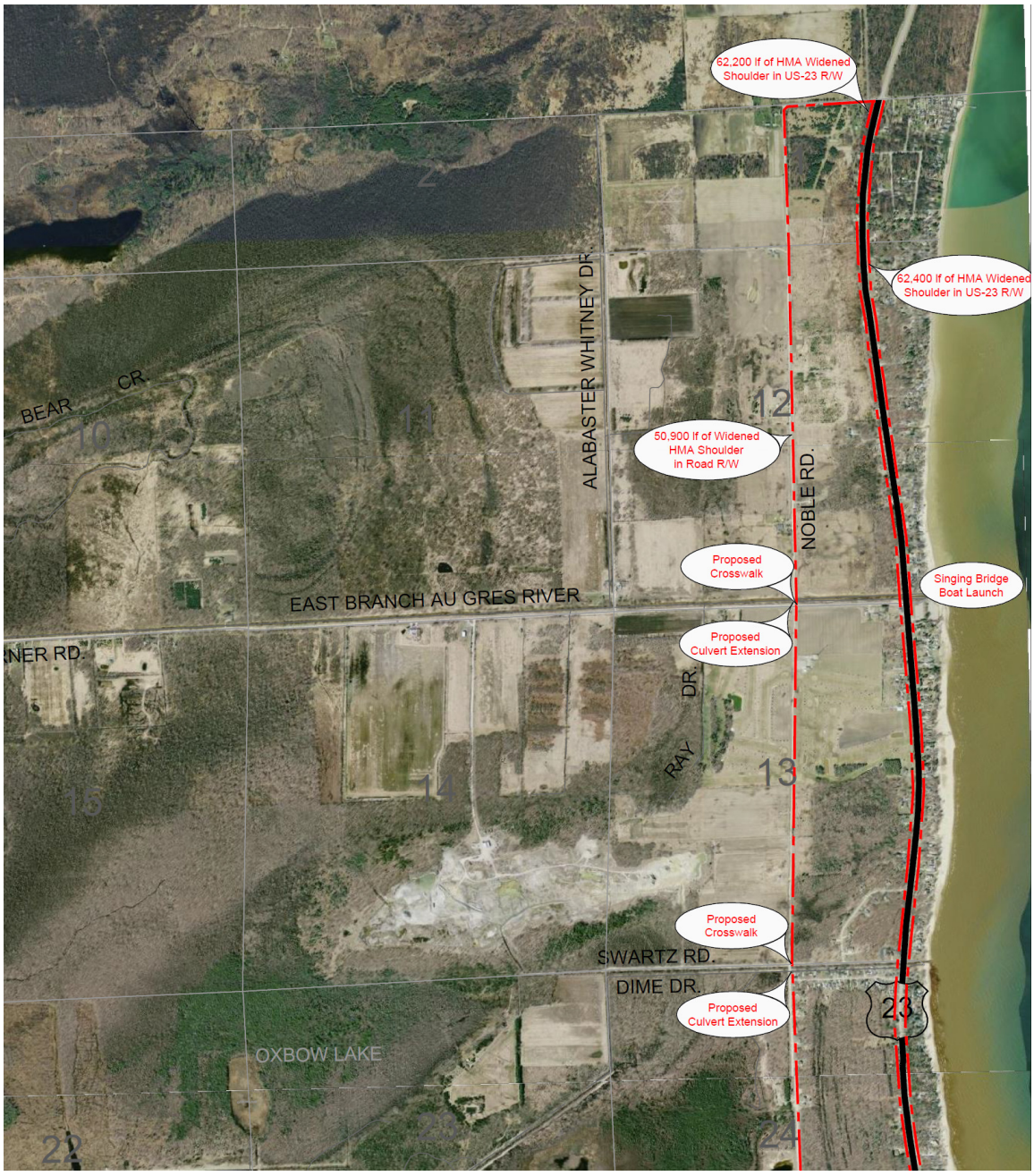
US-23 TRAIL

The US-23 Trail is proposed to follow the US-23 corridor along widened shoulders from existing sidewalks in the City of Au Gres to the Iosco County line. This trail segment also has an alternate side trail route that follows Delano Road north to Hammel Beach Road to the east then follows Andrews Road north to Twinning Road and then East to Noble Road and connecting back to US-23 at the county line.




Proposed Culvert Extension
HAMMELL BEACH RD.
Proposed Crosswalk
Proposed Culvert Extension
33
34
35
36
I,R7E
BESSINGER RD.
Proposed Crosswalk
Proposed Culvert Extension
DELANO RD.
50,900 lf of Widened HMA Shoulder in Road R/W
Sims-Whitney Beach
23
62,200 lf of HMA Widened Shoulder in US-23 R/W
62,400 lf of HMA Widened Shoulder in US-23 R/W
SCHNITZELBANK CR.
T19N,R7E
MICHIGAN AVE


ER RD.
Proposed Culvert Extension
DR.
RAY
15
14
13
Proposed Crosswalk
SWARTZ RD.
DIME DR.
Proposed Culvert Extension
23
OXBOW LAKE
22
23
24
TWINING RD.
Proposed Crosswalk
62,200 lf of HMA Widened Shoulder in US-23 R/W
VAN HORN RD.
ANDREWS RD.
50,900 lf of Widened HMA Shoulder in Road R/W
25
27
26
HAMMELL BEACH RD.
Proposed Culvert Extension
Proposed Culvert Extension
Proposed Crosswalk
62,400 lf of HMA Widened Shoulder in US-23 R/W
36



US-23 Trail

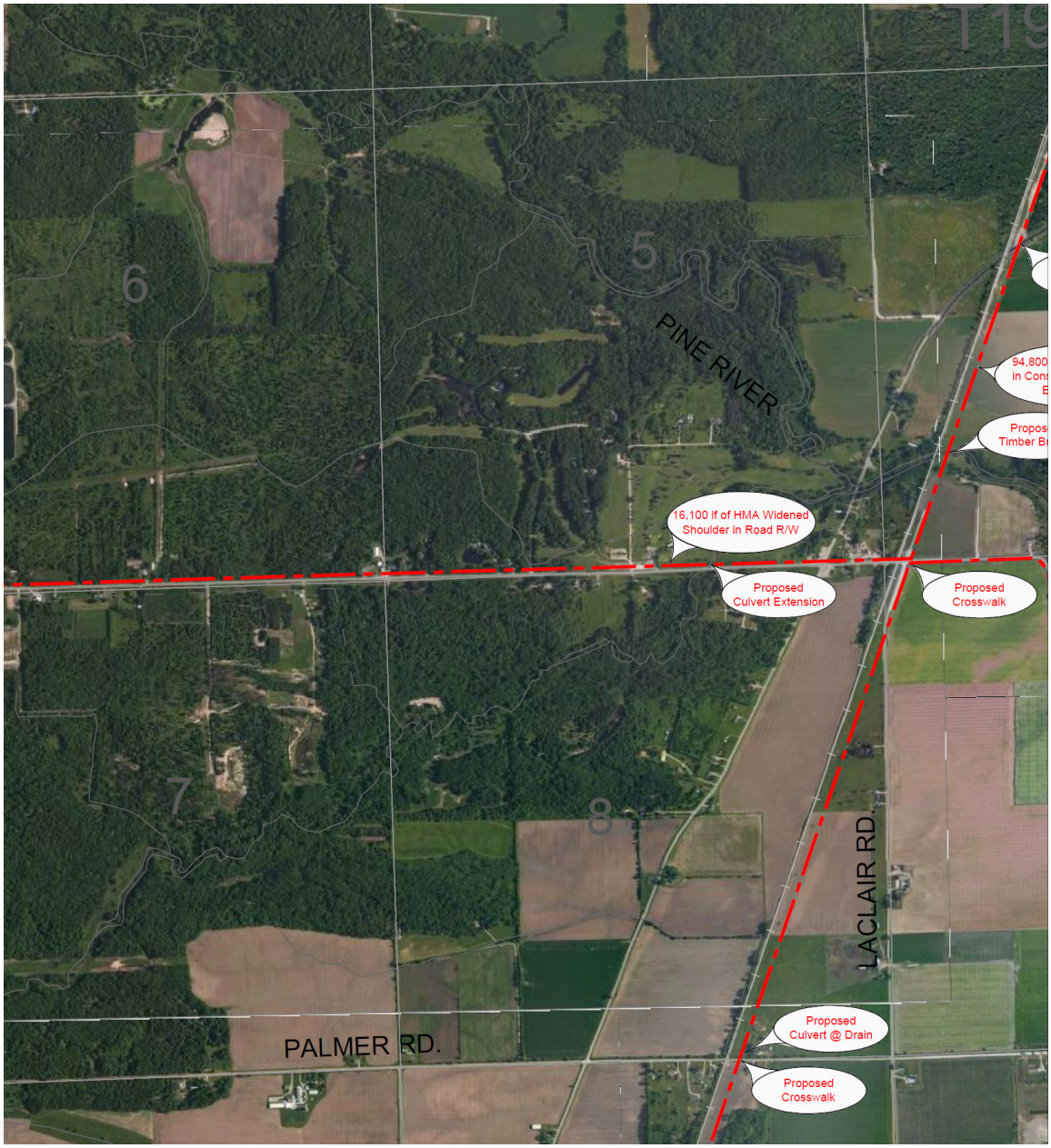
HMA Widened Shoulder (62,400 lf)	$1,600,000.00
Signage & pavement Markings	$150,000.00
Easement Acquisitions, Legal Fees, etc.	$10,000.00
Engineering	$190,000.00
Contingency	$150,000.00
Total Trail Costs	**$2,100,000.00**

US-23 Alternate Side Trail

HMA Widened Shoulder (50,900 lf)	$1,300,000.00
Signage & pavement Markings	$100,000.00
Minor Crosswalks (6 @ County Roads)	$15,000.00
Culvert Extensions (7)	$40,000.00
Easement Acquisitions, Legal Fees, etc.	$10,000.00
Engineering	$150,000.00
Contingency	$185,000.00
Total Trail Costs	**$1,800,000.00**

STANDISH CONNECTOR TRAIL

The Standish Connector Trail is proposed to follow existing Pine River Road as widened shoulder from the Pinconning to Au Gres Rail Trail west to the existing sidewalks in the City of Standish.



Standish Connector Trail

HMA Widened Shoulder (16,100 lf)	$450,000.00
Signage & pavement Markings	$25,000.00
Culvert Extensions (1)	$5,000.00
Easement Acquisitions, Legal Fees, etc.	$10,000.00
Engineering	$60,000.00
Contingency	$50,000.00
Total Trail Costs	**$600,000.00**

STANDISH STERLING SCHOOL TRAIL

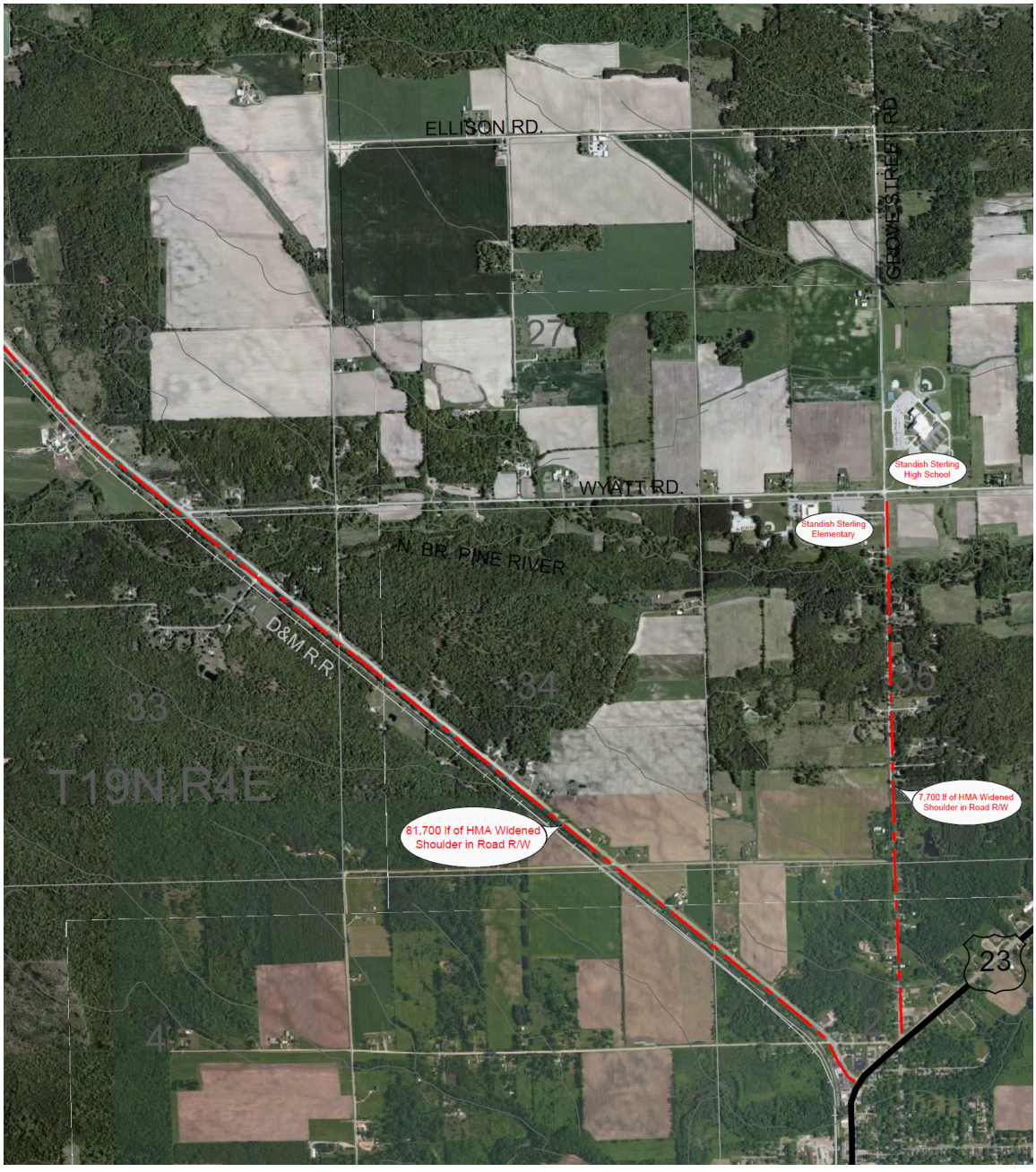
The Standish Sterling School Trail is proposed to follow the existing Grove Road as widened shoulder from the existing sidewalks in the City of Standish at US-23 north to the Standish Sterling Schools at Wyatt Road.

Standish Sterling School Connector Trail

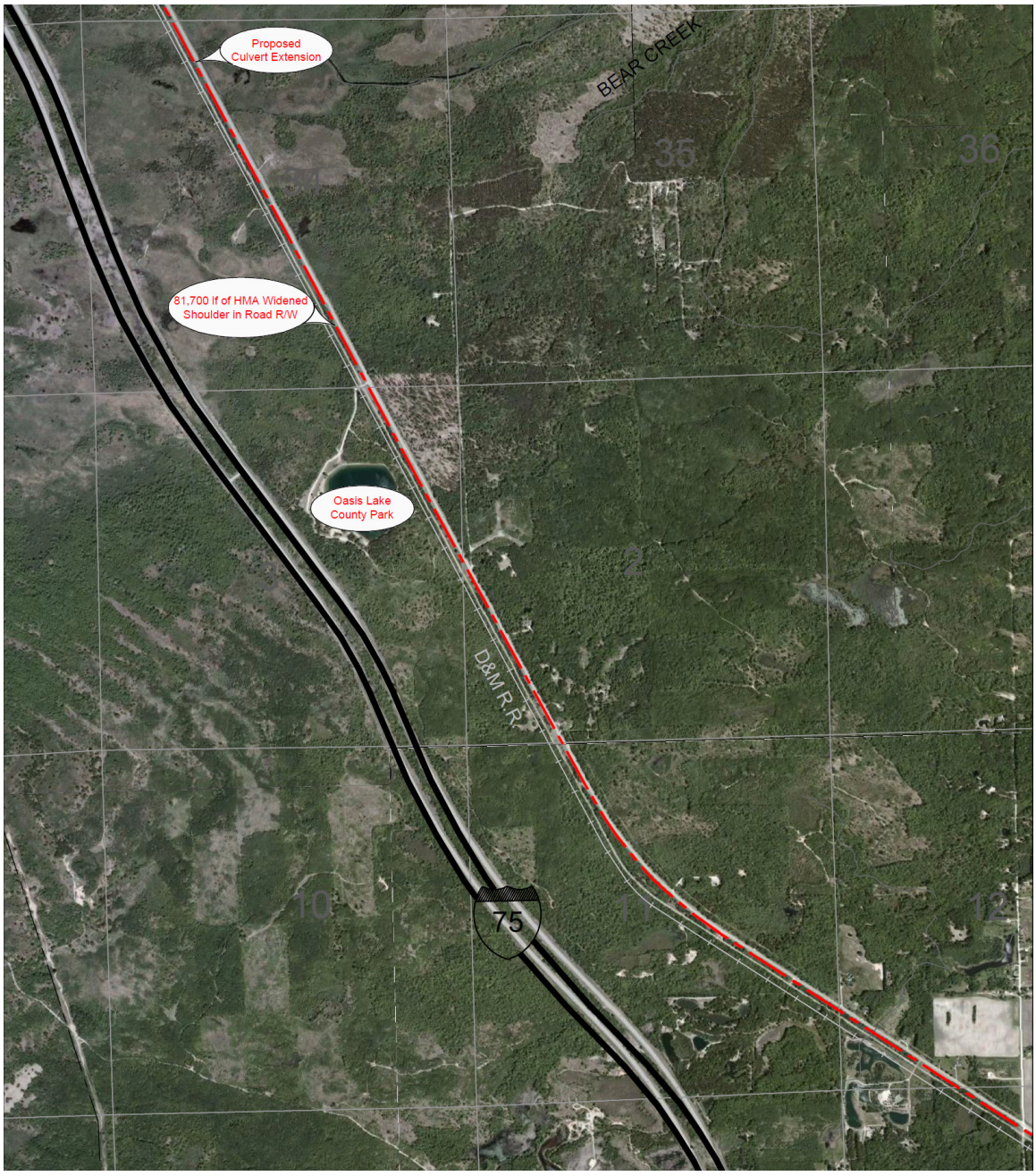
HMA Widened Shoulder (7,700 lf)	$200,000.00
Signage & pavement Markings	$20,000.00
Culvert Extensions (1)	$5,000.00
Easement Acquisitions, Legal Fees, etc.	$10,000.00
Engineering	$40,000.00
Contingency	$25,000.00
Total Trail Costs	**$300,000.00**

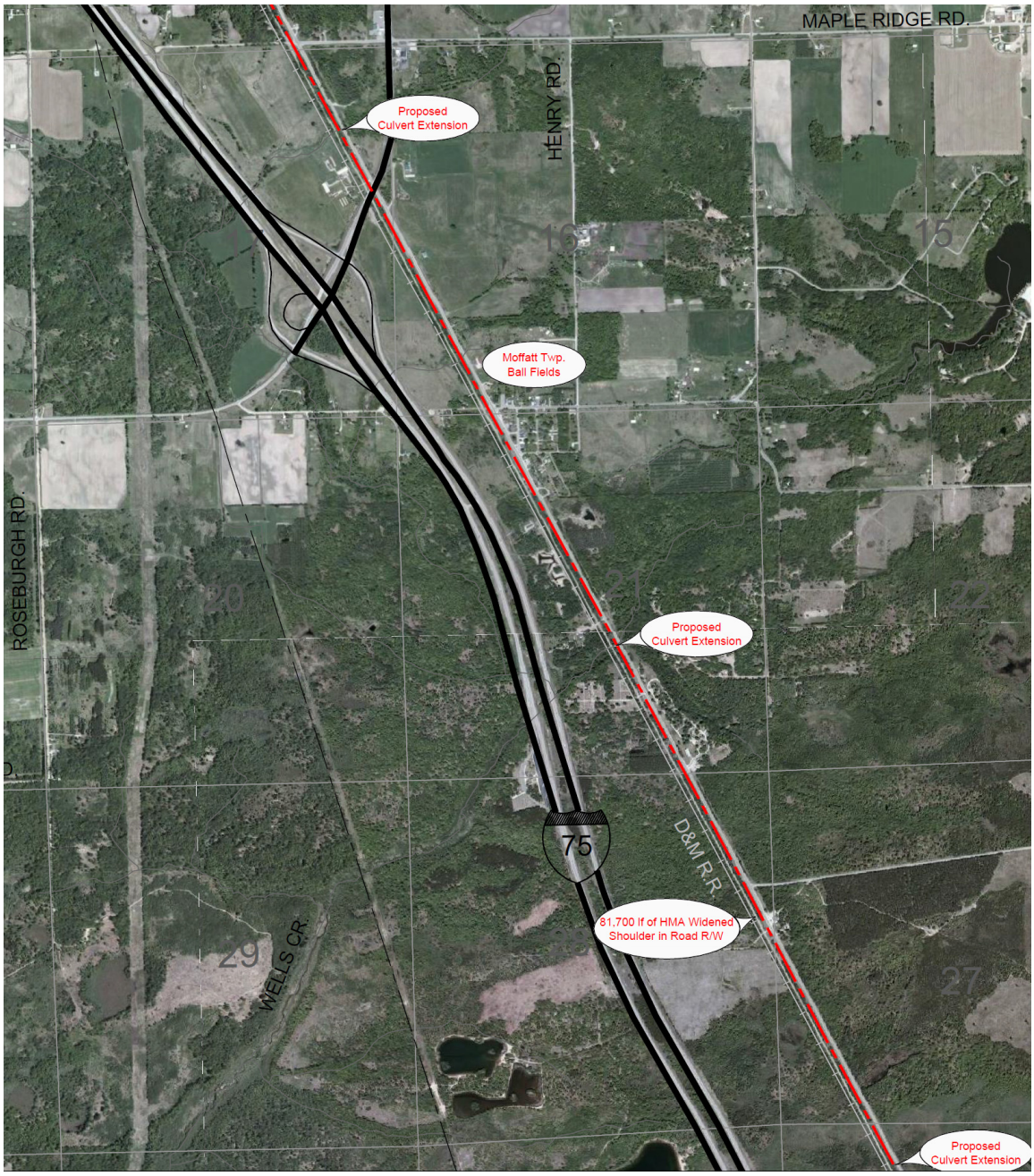
OLD M-76 TRAIL

The Old M-76 Trail is proposed to follow existing Old M-76 roadway as widened shoulder from existing sidewalks in the City of Standish at US-23 north to the Ogemaw County line. This trail segment will connect to Oasis Lake Park, the Sterling Parks, the Moffatt Township ball fields as well as the potential Ogemaw County Trails as depicted in the Ogemaw County Trails Master Plan.




GAVORD RD.
13
18
17
KOCAT RD.
KLEIN RD.
81,700 lf of HMA Widened Shoulder in Road R/W
Sterling Elementary
KUEHN RD.
Sterling Village Playground
24
19
20
MILNE ELLISON RD.
GAVORD RD.
SOUTH SCHOOL RD.
EDIE RD.
25
30
29
N. BR. PINE RIVER


Proposed Culvert Extension
BEAR CREEK
35
36
81,700 lf of HMA Widened Shoulder in Road R/W
Oasis Lake County Park
2
D&M R.R.
10
11
12
75


MAPLE RIDGE RD.
HENRY RD.
Proposed Culvert Extension
Moffatt Twp. Ball Fields
ROSEBURGH RD.
Proposed Culvert Extension
75
D&M R.R.
81,700 lf of HMA Widened Shoulder in Road R/W
WELLS CR.
Proposed Culvert Extension

Old M-76 Trail

HMA Widened Shoulder (81,500 lf)	$2,000,000.00
Signage & pavement Markings	$200,000.00
Minor Crosswalks (County Roads)	$15,000.00
Culvert Extensions (4)	$25,000.00
Easement Acquisitions, Legal Fees, etc.	$10,000.00
Engineering	$225,000.00
Contingency	$225,000.00
Total Trail Costs	**$2,700,000.00**

TRAIL PRIORITIZATION

The Arenac Heritage Route Authority has prioritized these potential trails and has determined that the first priority would be to make the connection from Bay County to Iosco County along the Saginaw Bay side of Arenac County via the proposed Pinconning to Au Gres Rail Trail route and the US-23 Trail and/or the US-23 Alternate Side Trail. Making this connection is a monumental task and is proposed to be broken down into smaller projects to make the effort more feasible. The first segment that is anticipated to be developed is the Omer to Au Gres Rail Trail segment of the Pinconning to Au Gres Rail Trail. The costs for this segment of the project have been broken down as follows:

Omer to Au Gres Rail Trail Segment

Aggregate base Pathway (35,600 sy)	$300,000.00
HMA Paving (26,700 sy)	$300,000.00
Minor Crosswalks (6 @ County Roads)	$10,000.00
Major Crosswalks (1 @ State Highways)	$15,000.00
Culvert Crossings (1)	$10,000.00
Easement Acquisitions, Legal Fees, etc.	$15,000.00
Engineering	$66,000.00
Contingency	$84,000.00
Total Trail Costs	**$800,000.00**

The second priority would be making the connection from Bay County to Omer and then completing the connection from Au Gres to Iosco County along the Saginaw Bay side of Arenac County. Much lower priority will be given to the connector trails along this route and development of these trail segments will occur as opportunities present themselves. Opportunities with the County agencies, townships and the Saginaw Chippewa Indian Tribe, as well as others, may allow for the development of these segments. Having this master plan in place and making everyone aware of these potential connector trail segments will help bring them to fruition. These connector trails include the following:

- **Wah Sash Kah Moqua Connector Trail**
- **Saganing Nature Preserve Connector Trail**
- **Standish Nature Preserve Connector Trail**
- **Pine River Boat Access Connector Trail**
- **Wigwam Bay Wildlife Trail**
- **Point Au Gres Loop Trail**
- **Au Gres Delta Nature Preserve Trail**

The next priority would be the Standish Connector Tail to provide connectivity from the county's largest city to the Pinconning to Au Gres Rail Trail. The Old M-76 Trail which would make the connection from Standish to Ogemaw County and has the connection point identified in their current Trail Master Plan would be the next priority. The M-65 Trail and the Standish Sterling Connector Trail would be the lowest priorities of this master plan.

POTENTIAL FUNDING SOURCES

This Bicycle and Pedestrian Trails Master Plan is a long-term vision for a connected non-motorized network within the city to connect to the larger, emerging regional and state-wide systems. Implementation of this vision will require extensive effort on the part of multiple agencies, departments, and organizations. The Master Plan, however, is intended to provide a foundation and vision for communities to reference as they continue to develop and contemplate future development strategies, resource protection, and community health and education opportunities. The cornerstones for successful implementation of this Master Plan are cooperation, coordination, and relentless focus on the overall goal of connectivity. The implementation strategies contained on the following pages are actions that will serve to move the creation of a connected, non-motorized system closer to reality. This portion of the Master Plan in particular should be reviewed on a regular basis as priorities shift, recommended actions are completed, and costs and funding opportunities change.

Potential funding sources for non-motorized planning, design and construction change and evolve on a regular basis. The requirements and deadlines for current sources are detailed here as a reference and resource. The next few pages are by no means all inclusive.

As was stated earlier, this master plan represents a long-term vision that may not be fully implemented for 20 plus years due to a variety of reasons including funding, politics, feasibility, public involvement and overall community priorities.

Pursuant to the Dodd-Frank Wall Street Reform and Consumer Protection Act, and the rules promulgated thereunder by the Securities and Exchange Commission, the content of this communication is not intended to be advice or recommendations regarding municipal financial products or the issuance of municipal securities. You should consult an independent municipal advisor registered with the Securities and Exchange Commission for any such advice or recommendations. Any information provided by engineer is solely provided for the purpose of providing engineering advice and is not to be considered advice concerning municipal financial products or the issuance of municipal securities.

Michigan Natural Resources Trust Fund (MNRTF)

The MNRTF provides funding for both the purchase of 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. There is no minimum or maximum for acquisition projects. For development projects, the minimum funding request is $15,000 and the maximum is $300,000. Applications are usually due by April 1st for development projects and by August for acquisition projects.

Trail Facts

- Businesses along the Hart-Montague Trail, a 22-mile trail in West Michigan, found that their sales revenue has increased 25-30-percent within the first six months of the trail's existence.
- A 2000 Michigan State University study of the Pere Marquette Trail found that 8 of 10 trail users also visited a business along the trail. Also businesses located within one-quarter of a mile of the Pere Marquette Trail reported that 96% of the employees use the trail.

The Land and Water Conservation Funds (LWCF)

The Land and Water Conservation Fund (LWCF) is a federal appropriation to the National Park Service that 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.

Transportation Enhancement Funds

MAP-21, the Moving Ahead for Progress in the 21st Century Act (P.L. 112-141), was signed into law on July 6, 2012. Funding surface transportation programs at over $105 billion for fiscal years (FY) 2013 and 2014. MAP-21 defines a bicycle transportation facility as "a new or improved lane, path, or shoulder for use by bicyclists and a traffic control device, shelter, or parking facility for bicycles."

To be eligible for MAP-21 funds, projects must either be associated with a roadway or consist of:

- Paved shoulders 4 or more feet wide
- Curb lane width greater than 12 feet
- Bike lanes; and/or
- Pedestrian facilities.

Or be separate from roadways and consist of:

- Multi-use paths at least 10 feet wide;
- Path/trail user amenities;
- Facility grade separations; and/or
- Bicycle parking facilities.

A minimum 20% local match is required for proposed projects and applications are accepted on an on-going basis with awards made twice a year. Eligible Transportation Enhancement work items include:

- Property acquisition
- Grade separation structures
- Grade preparation and surfacing
- Pavement marking and signage
- Trail heads.

National Recreational Trails Funding Program

The Recreational Trails Program provides funds for both motorized and non-motorized trail development. The Act provides for the transfer from the Highway Trust Fund of federal gasoline taxes paid on non-highway recreation fuel for off-road vehicles and camping equipment.

States can grant these funds to private individuals, organizations, city and county governments, and other government entities. Grant recipient are required to provide 20% of the total project cost. In Michigan, the Department of Natural Resources (MDNR) administers the program. There is no open application process and most of the money is used on DNR projects, a DNR Division can sponsor local projects.

Recreation Improvement Fund

This program, administered by the Forest Management Division of the Michigan Department of Natural Resources, makes funds available for the operation, maintenance and development of recreation trails, restoration of lands damaged by off-road vehicles, and inland lake cleanup.

American Greenways DuPont Awards Program

Administered by the Conservation Fund, in partnership with DuPont, and the National Geographic Society, this program provides grants of $500 to $2,500 to local greenways projects.

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 are submitted. Applications can be found at www.biketcba.org.

Recreational Equipment Incorporated (REI) Environmental Grants

The outdoor store and company, REI, Inc., dedicates a portion of its operating profits to help protect and restore the environment, increase access to outdoor activities, and encourage involvement in muscle-powered recreation. REI employees nominate organizations, projects, and programs in which they are personally involved to receive funding or gear donations. REI does not accept unsolicited grant requests and proposals. The company calls on their employees to nominate non-profit organizations for REI grants. Recent grants range from $2,000 to $25,000.

Michigander / Rails-to-Trails Conservancy Fund

The Michigan Field Office of Rails-to-Trails Conservancy has initiated a small grants program based on revenue from the Detroit Free Press MICHIGANDER Fat-Tire-Tour. The purpose of this new program is to aid the development of a connected trail initiative throughout the State of Michigan.

The Trust for Public Land

Founded in 1972, the Trust for Public Land is the only national nonprofit working exclusively to protect land for human enjoyment and well-being. TPL helps conserve land for recreation and spiritual nourishment and to improve the health and quality of life of American communities. TPL's legal and real estate specialists work with landowners, government agencies and community groups to:

- Create urban parks, gardens, greenways, and riverways
- Build livable communities by setting aside open space in the path of growth
- Conserve land for watershed protection, scenic beauty, and close-to-home recreation
- Safeguard the character of communities by preserving historic landmarks and landscapes.

In the past few years, the TPL has assisted several projects in Michigan.

Kodak Grants Program

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. Grants may be used for activities such as: mapping, ecological assessments, surveying, conferences, design activities, developing brochures, interpretive displays, planning, hiring consultants, etc. Maximum grant is $2,500, however, most grants range from $500 to $1,500. For more information go to www.conservationfund.org.

Cool Cities Grant Pilot Program

Michigan's Cool Cities Initiative is about reinventing Michigan's cities to be attractive places to live for an increasingly diverse group of residents. The pilot program promotes investment in neighborhoods that have, or are moving to create, higher density, a mix of residential and commercial uses, mixed income housing, and a pedestrian-friendly environment. 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. For more information go to www.coolcities.com.

Land Trusts

National, state, regional, county, and local private land trusts (or conservancies) can purchase land for resale to public agencies, buy options to protect land temporarily, receive land donations, put together land deals, and provide technical assistance. As private entities, land trusts can often act more quickly than public agencies.

Businesses & Corporations

Most towns have public-spirited companies. These firms have a history of helping worthy projects by providing a meeting room in a company building, giving small grants, donating copying or printing services on company equipment, or giving free or reduced fee use of the company's special services. For example, a law firm might provide "pro bono" legal advice or an accounting firm might donate staff time to assist in developing a simple bookkeeping system.

Friends Groups

We all need friends and this holds true for greenway and non-motorized projects as well. In fact, the long-term success of a project can well depend on the formation of an ongoing, private "Friends of the Trail" organization. Friends groups can provide a number of services including: physical labor as through "Adopt-a-Trail" maintenance or construction activities, fundraising, user education, promotion, and actual surveillance of the facility. These groups are important in all project phases: planning, acquisition, development, and operation.

Other Organizations

Civic groups and school groups can play an important role in support of a greenway project. They might help with trail development and maintenance, funding, promotion, and through the hosting of events. These activities can be separate from, or in conjunction with a friends group.

Individuals

Willing individuals can donate money, land, easements and services. In numerous cases across the country, the financial contribution of a single individual has meant the success of many trails and greenway projects.

Foundations

Private Foundations are non-governmental, nonprofit organizations have a principal funds of their own managed by its own trustees and directors, and established to maintain or aid charitable, educational, religious, or other activities serving the public good, primarily by making grants to other nonprofit organizations. The overwhelming majority of foundation grants are awarded to nonprofit organizations that qualify for "public charity" status under Section 501(c)(3) of the Internal Revenue Code.

Often, the success in securing funding for projects depends just as much on how a potential funder is approached as the type of project to be funded. Foundations, corporations, nonprofit groups, and individual and family donors are owed, and expect, professionalism and courtesy from those seeking financial assistance. In all cases:

- Address all letters individually. Be short and clear. Send pictures or graphics. Include a return envelope.
- Thank you is a must.
- Extend invitations to events celebrating ground breaking, final construction, and special programs. These are important ways of expressing public appreciation and urging increased use of facilities.
- Include a donor's name and/or logo in all press releases and printed materials.

Many foundations, large and small, may be interested in supporting non-motorized projects.

Approaching funders should always be done carefully. Steps to consider:

- Research the actual Foundation giving patterns. A preliminary, well-prepared phone call to the contact person will provide an indication of whether the foundation will consider this plan or aspects of it within their mission and giving

pattern. Contacts will also indicate how they want to be approached, application format and grant cycle.

- A well-designed initial letter and single page description of the goals, benefits, costs, budget, and partners of the plan may be submitted.
- Linking the funding request to larger community, neighborhood, economic, environmental, beautification and youth and healthcare benefits is important.
- A full grant application may be requested.
- Interviews or meetings to discuss the project face-to-face are important when requested by the funder.
- Large foundations may have more complicated procedures than the smaller foundations. Know the foundation.
- Follow-up calls and thank you letters are welcomed and appropriate.
- Most foundations want to see that other foundations, businesses and individuals are contributing. Be prepared with a list of other contributor donations towards the total project expenses.

Identify which enterprises may be interested in non-motorized projects in this area. Some will be interested in community improvement, or economic benefits, or neighborhood revitalization. Use the same approach as for foundations, but incorporate ways the plan improvements will contribute to their businesses. Be prepared with a match or to identify contributions from others.

Many nonprofits have a genuine interest in non-motorized transportation. Larger nonprofits, like hospitals and government units, will often contribute if they see direct benefits to healthcare, community improvement or bringing people to their facilities. Emphasize these important aspects.

Research those individual/family donors who are community contributors. Approach them through someone who knows them and can speak with you about the Plan and funding need.

Develop clarity about the size and purpose of each individual/family request before any approach is taken. Individual/family approaches can be taken through:

- Personal phone calls and meetings.
- Fund Raising letters to the public and/or through a targeted list developed for fund raising for this project.

Grant Writing

Compiling and writing a successful grant application is not an easy task, particularly when funds for non-motorized projects in Michigan are highly competitive. There are

several things that should be kept in mind when deciding whether or not to apply for funding assistance, and when developing a grant application.

Do your homework up front and fully understand the goals and purpose of the funding agency. This is essential in determining whether or not your project has a high likelihood of being considered for funding. Understanding the funding source will require work up front, but it could save you the time of completing an entire application for nothing if your project scope is not appropriate. This upfront work could also change your project scope and can definitely make your application stronger.

When at all possible, talk with a representative of the funding agency either via phone, or better yet, in person to discuss your project before investing time and resources in completing a grant application. Be prepared to show photos and a map of your proposed project. This meeting or discussion will help you make a final decision as to whether or not you should submit an application. This will also make the funding agency aware of your project and will give them some context and understanding when reviewing your application.

It is essential, particularly in non-motorized planning, design and construction projects, to collaborate with multiple agencies, organizations and departments. Meet early on with adjacent communities, with adjacent property owners, and other interested parties. Gather their input and incorporate it into the grant application and design. Include letters of support from the various partners you have developed. Funders are looking for projects with collaboration and broad support that will improve a community and provide benefits to an expansive cross-section of the population.

The time it takes to assemble a high-quality grant application is often underestimated. Meeting with potential partners, gathering letters of support, generating solid cost estimates, developing graphics, taking photographs, holding public hearings, getting resolutions of support from governing bodies and discussing your project with potential funders takes a considerable amount of time. Deciding to submit a grant application three weeks before it is due will likely not yield a strong submittal and chances for success are lessened. Be aware of funding opportunity due dates and make decisions to assemble an application package at least two to three months prior to the due date.

Assume the readers and evaluators of your grant application has never been to your community and that they know very little about your project or your efforts to date. In your grant application, describe your project scope and benefits, and include photographs and graphics that clearly and concisely illustrate your project. If it's part of a bigger project, describe the bigger project, but make it very clear the exact scope and elements that you are requesting funding for. Set the stage and paint the picture for the application reviewer. What is clear to you may not be clear to someone who has never been to your community or never walked the proposed trail route.

Enlist help and assistance from someone who has experience in designing and constructing non-motorized systems to develop a cost estimate to include in your grant application. This is a difficult task because often you will be attempting to generate a cost estimate based on a loose concept plan. You may not have completed soil investigations, you may not have preliminary engineering completed, you may not know the exact route or location of the trail, or fully understand the extent of necessary permits, length of boardwalk necessary, or cost of construction design drawings. If awarded a grant, your community will be held to the funding amount requested in your application. Any cost overruns are typically the responsibility of the grantee, not the grantor. It is essential to ensure you have developed conservative cost estimates and are capable of providing the local match. You don't want to be in the situation of having to return grant funds because you underestimated the cost of the project and now don't have sufficient local funds to complete it.

Fully investigate and understand how the funding source and its requirements and stipulations will affect the timing of your project. It can take many months to hear whether or not your project has been selected to receive funds and then several more to execute an agreement with the funding agency. Typically, no work can be done on your project (that you expect to be reimbursed for) prior to an agreement being executed. Your public and governing bodies need to be aware of the potential delays in beginning the project versus the potential benefits of funding assistance.

Local governing documents, such as master plans, parks and recreation plans, and land use and transportation plans should be amended to include content consistent with this plan.

Implementation Highlights

- Annual operation and maintenance costs for the Green County, Ohio trail way system are $3,200 per mile. Occupation fees are a source of funding for operations and maintenance on trails with public utilities, communications or other corridor users.
- An endowment for the Pere Marquette Rail-Trail supports annual trail way operations and maintenance costs of approximately $75,000, or approximately $3,800 per mile. It is managed by the Midland Area Community Foundation.
- Conservation ballot measures pass 77% of the time, with voter support a consistent 60% across all jurisdictions. Since 1998, Michigan voters have approved 24 out of 37 local government measures (a 64% passage rate) authorizing $258 million in conservation funding. All except one of these involved property tax increases.
- Trails and greenways are not ranked by voters as strong purposes by themselves and frequently, did well where included in broader based funding packages.
- Private funding sources interested in trail ways tend to be regionally focused, rather than statewide. Endowments for state trail maintenance are not likely.
- The more evidence that the impact is regional, rather than local, the more compelling and attractive the issue becomes.

Source: Connecting Michigan, 2007, Michigan Trails and Greenways Association.

Communities should encourage local developers to incorporate non-motorized connections into their site designs. Try to ensure that these smaller trail systems are

linked with the larger regional system, or at least have the potential to connect. Connectivity within the development, as well as with adjacent land uses, should be recommended. The inclusion of these trailways in local developments throughout the County will generate a more connected trail system.

Collaboration is vital to the success of a regional trail system. Every effort should be made to cooperate and coordinate non-motorized goals with neighboring communities, the County Road Commission, and the Michigan Department of Transportation. A map of potential trail connections and proposed corridors should be created and updated on a regular basis and made available to all trail planning bodies. Some of proposed trailways identified in this plan are over, under, in, or along road rights-of-way. Collaboration with Michigan Department of Transportation and the County Road Commission should frequently occur to discuss the possibility of utilizing these areas for trail development. These two organizations oversee the construction and maintenance of almost all of roadways in the county.

All transportation projects receiving federal funding in the county are identified in the Transportation Improvement Program (TIP). This document represents transportation projects receiving federal funding for the identified fiscal years. Non-motorized facilities should be incorporated into TIP road projects. Coordination with road projects will make trail development more efficient and feasible.

Gaining grant funding for local trails should remain upon the top of the to-do list. Lack of funding is often the largest barrier to trail development. Trail planners should be actively seeking grant funding from those programs listed in this document and also searching for additional sources.