

Meridian Township Greenspace Plan



FINAL REPORT

Prepared For:



Charter Township of Meridian

Prepared By:



THE GREENWAY COLLABORATIVE, INC.

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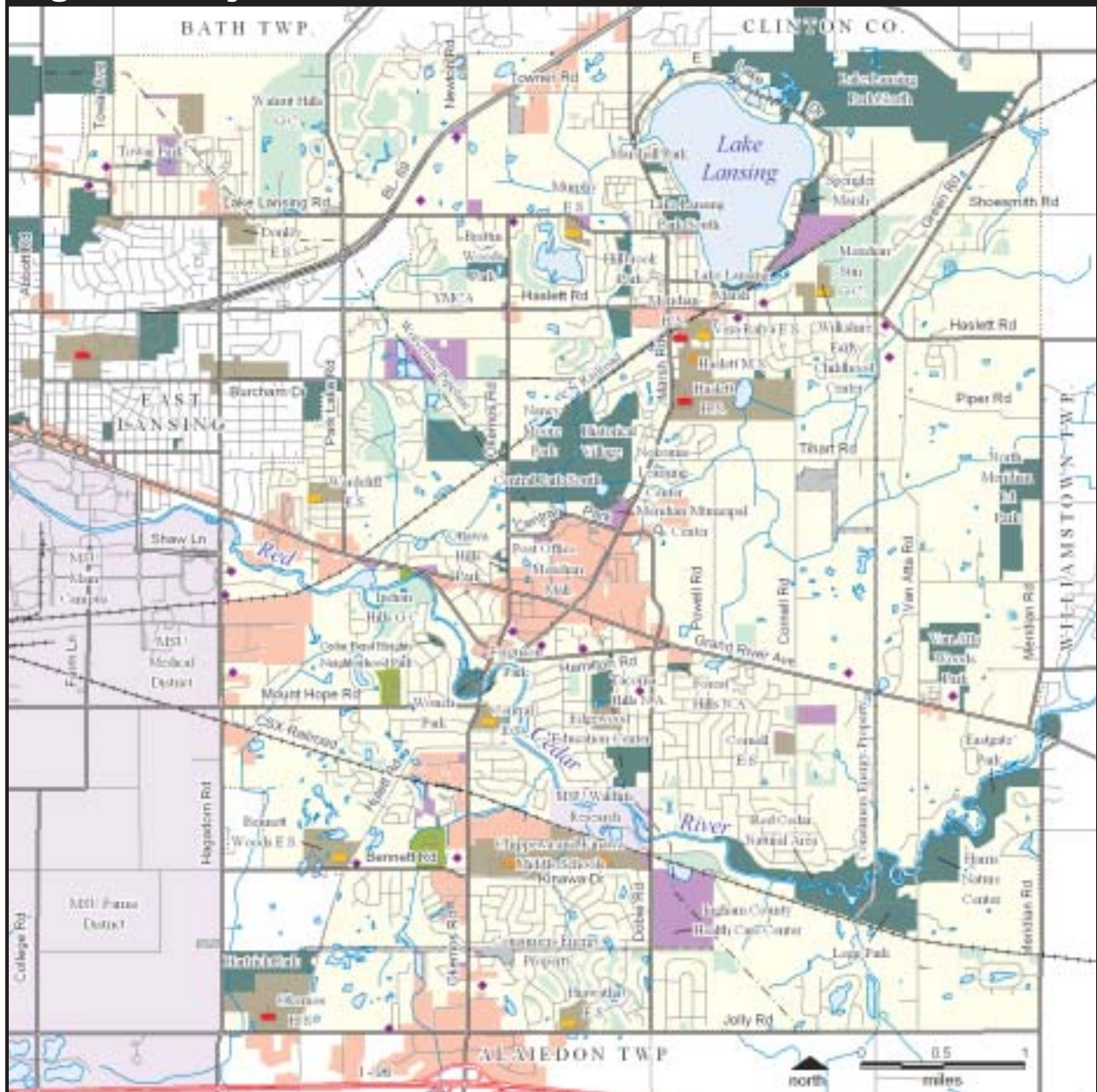
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Notes:
The Draft Final Greenspace Plan was formally adopted by the Township Board on December 16, 2003. As specified in the resolution, minor corrections and edits were made in the final report.

In addition to this document, there is a separate 64-page Appendix that includes inventory and analysis maps, public input results, and meeting summaries.

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Fig. 1a. Project Area



Legend

- Place of Worship
- High School
- Middle School
- Elementary School
- Water Body
- Commercial/ Office
- Public School Property
- Parks and Open Space
- Other Public Land
- Private Open Space
- Cemetery
- MSU Property
- Public Utility
- Meridian Township

1. Introduction

The Meridian Township Greenspace Plan grew out of Township residents' wishes to protect the area's natural resources while accommodating new development. There is a desire that growth come not at the expense of water quality, natural systems, and wildlife, rather, that new development be used as a tool to permanently protect key natural and cultural resources and enhance the Township's sense of place. The plan outlines ways in which growth and development in the Township can continue to occur while simultaneously protecting the natural systems and community character of the Township.

The Greenspace Plan is multi-faceted, reflecting the input of the citizens of Meridian Township. It is structured to preserve and enhance the community character by establishing a greenspace system that incorporates:

- Wildlife corridors that link existing natural preserves
- Scenic roadways that preserve views of natural areas
- Key waterways, adjacent wetlands and upland buffers
- Walking and biking routes that link parks, schools and other community resources
- Agricultural lands

Project Context

Meridian Township is approximately 32 square miles in size (Figure 1a), and about 40,000 people call the Township their home. Meridian Township is in many respects a microcosm of urbanizing communities throughout Michigan. It is working to establish its own identity and at the same time define its relationship with its urbanized and growing neighbor, East Lansing. While Meridian Township is a Charter Township, it has a population, commercial core, and a sophistication of government services that surpass many cities. The location of Meridian Township in the expanding metropolitan area of Lansing makes it subject to intense development pressure.

The Township's proximity to and inclusion of portions of Michigan State University (MSU) have a profound influence on the community. Many people who live in the Township are directly associated with the university. Even for those who are not affiliated with the university, MSU hosts numerous public events throughout the year and serves as a regional park for many residents in the summertime when the campus landscape is at its peak and there are fewer students on campus. It is also the gateway to the Lansing River Trail system. There has been extensive planning and some implementation on formalizing a trail extension through campus from Harrison Road to Hagadorn Road. This project, known as the Red Cedar Greenway, was planned with the idea of continuing the trail into Meridian Township.

Project History

In February and March of 2002, the Meridian Township Board convened for a series of “visioning sessions” to determine how to tie together existing plans and the new Land Preservation Millage into a long range vision for how the Township could grow wisely while still protecting its natural resources. Voters in the 2000 Township elections made it clear that they felt concerned about the character and the rate of development in the Township. Many development plans were being submitted to the Township that, while compliant with the current zoning regulations, were not capturing the character and feeling of the Township that the residents wanted to see.

Township Board members thought that outside guidance was needed to help the Township determine a smart growth strategy. Through the visioning sessions, and with the help of the Planning and Zoning Center in Lansing, the Township crafted a proposal for proceeding with the development of a Greenspace Plan.

In September 2002, a Request for Proposals for the Greenspace Plan was sent out, and in November, the Greenway Collaborative, Inc. of Ann Arbor was hired to develop a plan. Work on the project began in December 2002.

Green Infrastructure

Meridian Township has an extensive park system with a total acreage of about 1,318 acres or 6% of the township. Meridian Township also has a set of natural feature protection ordinances that protect floodplains, wetlands, and the areas immediately adjacent to wetlands, ponds, and waterways. While the ordinances protect specific features, they do not guarantee a functioning natural system. As areas develop, many of these natural features can become isolated and wildlife habitats become islands that are incapable of recovering from system imbalances caused by disease, predators, or human activity.

Therefore, the plan establishes the principle that greenspaces and pathways should be viewed as a type of community infrastructure that must remain interconnected to be functional. Thus, just as road and sewer lines link together and function as a system, natural systems and non-motorized connections should also function as a system. The greenspace plan identifies areas in the Township that are worth preserving and protecting from development in order to keep the natural system functioning and healthy. It also identifies strategies for ensuring these spaces remain linked and connected as a whole.

Resource Identification and Prioritization

The plan identifies natural resources that should be preserved in order to ensure that the greenspace within the Township continues to function as a system. The plan defines not only what should be protected based on public input and a detailed ecological assessment, but also how it should be protected through a number of implementation tools that fit a variety of situations. It indicates important riparian corridors and upland areas that are critical for maintaining healthy wildlife populations. The plan also identifies scenic roadways where views of farmland, open space and the rural character of Township are prominent, and strategies for protecting those views. Throughout the process, the goal has been to define an equitable solution that may be embraced by developer and naturalist alike.

While the plan does prioritize natural resources in the Township, it does not locate specific properties for preservation on a parcel-by-parcel basis. The greenspace plan was designed to serve as a supplement to the Land Preservation Committee’s process of identifying properties for acquisition with millage funds. It should be recognized, however, that the greenspace plan is only one factor in a large list of criteria for determining property acquisitions, the most important of which is a willing seller. Therefore, while it is encouraged that the acquisitions support protection and enhancement of the greenspace corridors as directly as possible, this may not be practical in all acquisition cases.

Promoting Healthy Lifestyles

In the spring of 2003, the Township was recognized by the Governor's Council on Fitness for its on-going efforts to become a "walkable-bikable" community. The greenspace plan supports the important efforts the Township is already pursuing by outlining a non-motorized system of linked trails, pathways, sidewalks and bike lanes for recreation and transportation uses. These trails and pathways connect the parks, greenspaces, civic centers, schools and neighborhoods of the Township.

Community Benefits

Greenspaces enhance the quality of life of Meridian Township residents by not only protecting wildlife and water quality, but by providing recreation opportunities and places for communities to congregate. Across the country, subdivisions that incorporate greenspaces have been successful for the developer, homeowner, and the community. These respond to the consumer's demand for natural surroundings and convenient walking paths. They also lessen the impact of new development on existing residents.

The improved quality of life that greenspaces and trails provide comes with economic benefits that include higher returns on property development, reduced community infrastructure costs, and enhanced personal property values. A Township plan that protects natural resources, encourages active lifestyles, and brings economic benefits serves the health, safety and welfare of the citizens of Meridian Township.

How it Works

The most significant tool outlined in the Greenspace Plan is conservation zoning. Conservation zoning permits the same level of development as is currently zoned but reduces the land area that is developed through clustering of houses. This allows for the preservation of natural and cultural resources. This is done by designating 30% of the "developable" land towards green spaces defined by the plan. For example, if under current zoning, a site has 100 acres of upland area on which 150 homes could be constructed, those 150 homes would be built on no more than 70 acres. The remaining 30 acres would be used to complement the existing natural feature protections and establish priority conservation corridors. Other resources such as scenic roads can also be protected.

The key to success of conservation development is identifying the general location of the conservation corridors so that as sites are developed, natural corridors can seamlessly traverse the landscape. A degree of flexibility and site specific assessment is built into the process to account for development challenges. Other tools such as purchase of development rights may be used to preserve large agricultural lands and keep active farming in the community. For areas that are already developed, tools including voluntary stewardship and conservation easements can be used.

Planning Process

The plan was developed over nine months beginning in February of 2003. Throughout the process there were regularly scheduled meetings with the Greenspace Advisory Committee and the public to provide project review and input. The work program includes five main phases:

1. Inventory & Analysis - February and March 2003

The purpose of this step was to inventory existing resources throughout Township and document the information in a format understandable to the general public. Documentation of this information can be found in the Appendix.

2. Public Input and Visioning - April 2003

The purpose of this step was to establish a forum to share information with the public about the Plan and to supplement and refine the existing conditions by the Township citizens. Another key component was identifying community hopes and concerns in formulating a greenspace vision. Visioning Workshops were held on April 28, 29. Documentation of this information can be found in the Appendix.

3. Analysis and Alternatives - May and June 2003

The purpose of this step was to prepare alternative approaches that addressed the draft vision, goals, and objectives and explore their effectiveness, appropriateness, and implications. Alternatives Workshops were held on June 18 and 19. Documentation of this information can be found in the Appendix.

4. Preliminary Greenspace Plan - July and August 2003

The purpose of this step was to develop a draft version of the Greenspace Plan that was presented to the Meridian Township staff, the Greenspace Advisory Committee and the public for review and feedback. The Preliminary Plan Workshop was held August 14, 2003

5. Final Greenspace Plan - September and October 2003

The purpose of this step was to provide the Township Board with a Greenspace Plan suitable for use in the plan adoption process along with all source files to facilitate any minor changes that may become necessary. The Draft Greenspace Plan was presented to the Township Board on October 21, 2003. The Plan was officially adopted by the Township Board on December 16, 2003.

Anatomy of A Greenspace System

A greenspace system can be viewed as having three key elements: links, hubs, and sites (Figure 1b).

Links are the heart of the greenspace system. They are the linear connections for people and wildlife. Links are comprised of the Priority Conservation Corridors, Scenic Road Corridors, and the Non-motorized Corridors.

Hubs are the anchors for the system. Hubs provide a base or destination for people and wildlife. They include the large parks and open space systems like Lake Lansing Park, Red Cedar Natural Area, and Central Park.

Sites are smaller features than hubs and serve as points of interest, origins or destinations. Schools, commercial areas and neighborhood parks serve as human sites. Individual wetlands, pocket habitats and smaller protected properties are sites for wildlife and plants.



2. Vision, Goals and Objectives

A set of Vision, Goals, and Objectives was created based on the input from the visioning document and professional judgment. The Draft Vision, Goals, and Objectives were then presented at the Alternatives Public Workshops in the form of a worksheet where people could indicate whether they Strongly Agree, Agree, but with modifications, or Disagree. There was also an area for the workshop participants to suggest additions, modifications, or express strong objections. The respondents' complete written comments have been included in Section 5 of the Appendix.

In general the Draft Vision, Goals, and Objectives were well received. Minor modifications were made and presented at the subsequent Preliminary Plan Public Workshop. The Goals and Objectives were then used as means to evaluate the Preliminary Plan.

Three goals were used to reflect the major aspects of the project:

- Greenspace Network
- Non-motorized Linkages
- Implementation

Vision Statement

When implemented, the greenspace plan will provide a network of green spaces and non-motorized linkages that will protect and connect valued natural and cultural resources, provide linkages to adjacent communities, and improve the quality of life for Township residents.

Greenspace Network Goal

Identify a network of ecologically and culturally valuable resources to be protected.

Objectives:

1. Diverse and unique lands are preserved.
2. Protected features should reflect public consensus received during the planning process.
3. Majority of all future protected lands should be integrated in a network whenever possible.
4. The impact of transportation facilities on wildlife corridors is mitigated.
5. Corridors will be identified through currently developed areas that, while perhaps not feasible now, may eventually be incorporated through redevelopment.

Non-motorized Linkages Goal

Define an off-road system that links major destinations for both recreation and transportation and provides opportunities for people of all abilities.

Objectives:

1. Non-motorized links should reflect public consensus received during the planning process.
2. Design of the non-motorized facilities should reflect current best practices for safety and accommodation.
3. System should connect the Township's major parks, schools, adjacent communities, MSU and commercial centers.
4. System should complement the existing and planned on-road non-motorized transportation facilities.
5. Links will be identified through currently developed areas that, while perhaps not feasible now, may eventually be incorporated through redevelopment.

Implementation Goal

Outline a feasible implementation strategy that provides an equitable solution for all stakeholders.

Objectives:

1. Negative impact on land values should be minimized.
2. Reflects Township's expectations for development.
3. Expedites site-planning process for proposals that meet the Township's expectations.
4. Provides incentives to land owners for voluntary conservation measures.

3. Plan Overview

The Greenspace Plan was designed to look at the ecological patterns, development patterns and economic considerations of the Township to formulate an equitable and feasible plan for the Township. The plan (Figure 3a) is organized into three interrelated components: the Physical Network, Conservation Tools, and the Implementation Strategy. The following introduces the three components:

Physical Network:

This illustrates what the plan will look like when implemented. The key elements are:

- Priority Conservation Corridors - a network of ecologically significant open space.
- Scenic Road Corridors - roadways that are tree-lined or have outstanding views.
- Non-motorized Corridors - a system comprised of off-road pathways and on-road connections that tie together key destinations around the Township. These are not intended to serve as a comprehensive system but rather, complement existing and proposed Township facilities.
- Areas of Special Concern - unique opportunities and challenges including remaining agricultural areas and fragile or fragmented ecological corridors.

Conservation Tools:

These are the means with which the physical network may be established. The tools include:

- Conservation Zoning - development is clustered so that 30% of a developable site may be set aside for open space.
- Conservation Easement - voluntary dedication of private land to permanent open space.
- Trail Easements - voluntary dedication of private land for public access.
- Voluntary Stewardship - education, encouragement and technical assistance programs.
- Land Acquisition - purchase of land from willing sellers.
- Purchase of Development Rights - property remains in private ownership but ability to develop is voluntarily relinquished through a purchase of those rights by the Township or a conservation organization.
- Linked Site Plan Approvals - allow for non-contiguous sites to be considered as one site if it meets the Township's open space preservation objectives.

Implementation Strategy:

There is no one tool that matches each aspect of the physical network under every circumstance. The following is a list of different property ownership and states of development that dictate the different tools that must be engaged to implement the physical network:

- Vacant/Undeveloped - where the plan may be implemented as a parcel is developed.
- Private Residential - land that is currently in residential use
- Commercial - including business, industrial or utility property.
- Institutional - lands of organizations with a public or community service character such as religious institutions, hospitals, schools and parks.

Fig. 3a. Greenspace Plan



The major feature of the plan is its emphasis on linked systems for connecting natural areas, people and places around the Township. The linked system is designed to provide a diversity of functions from protection of habitat to preservation of scenic views. The plan has been formulated using scientific principles of landscape ecology and conservation biology as well as input from the citizens of the Township, the development community, and appointed public officials.

The Greenspace Plan is comprised of three key elements:

- Priority Protection Corridors
- Scenic Road Corridors
- Non-Motorized Corridors

Implementation Design Guidelines

Figure 3b shows how the components of the plan can be used to establish the greenspace network in a variety of places and conditions. The illustration shows an area typical of Meridian Township, with a combination of new residential development, existing commercial development, and farmland. The Priority Conservation Corridors, Scenic Road Corridors, and Non-motorized Corridors are interconnected across these different land uses and ownership types. A variety of guidelines have been prepared to protect and preserve these networks. A description of the components of the physical network and their accompanying design guidelines are in the section that follows.

Fig. 3b. Overview



Legend

	Priority Conservation Corridor: undeveloped, protected openspace		Stream
	Maintained landscape: lawns, business frontages, ornamental plantings, swales		River
	Farmland		Scenic Road Corridor
	Impervious surface: parking lots		Road
	Public park		Off-road Pathway
			Sidewalk

- 1 Existing hedgerow should be preserved between new development and farmland as a buffer. If no hedgerow exists, houses should be setback from edge of development to minimize conflicts between agricultural and residential uses.
- 2 The Township should work with key property owners to secure trail easements through private property to complete the non-motorized system and acquire conservation easements from willing land owners in key locations.
- 3 The trail system should be located on the edge of the Priority Conservation Corridor in sensitive areas.
- 4 Neighborhoods should include a range of open spaces, from structured play areas to natural places.
- 5 The non-motorized system should provide connections between neighborhoods.
- 6 New residential development should be clustered to provide open space and protect the Priority Conservation Corridors.
- 7 The edges of the Priority Conservation Corridors should be irregular to maximize edge habitat.
- 8 The non-motorized system provides connections between residential neighborhoods, commercial, and civic destinations.
- 9 Existing township parks should act as hubs for the Priority Conservation Corridors and destination points for the non-motorized system.
- 10 Vehicular access control along a commercial strip improves non-motorized facilities along the main corridor by limiting number of entering driveways.

4. Physical Network

The physical network identifies the location and nature of specific resources and amenities within the Township for protection and implementation. These include Priority Conservation Corridors, Scenic Corridors, Non-motorized Corridors, and Areas of Special Concern.

4.1. Priority Conservation Corridors

The Priority Conservation Corridors (PCC) are the backbone of the Greenspace Plan (Figure 4a). They are a network of ecologically significant open spaces. Their primary purpose is to provide and link wildlife habitat, protect water quality and preserve the natural character of the Township. They may correspond in some places with the non-motorized corridors but in some places public access will not be permitted.

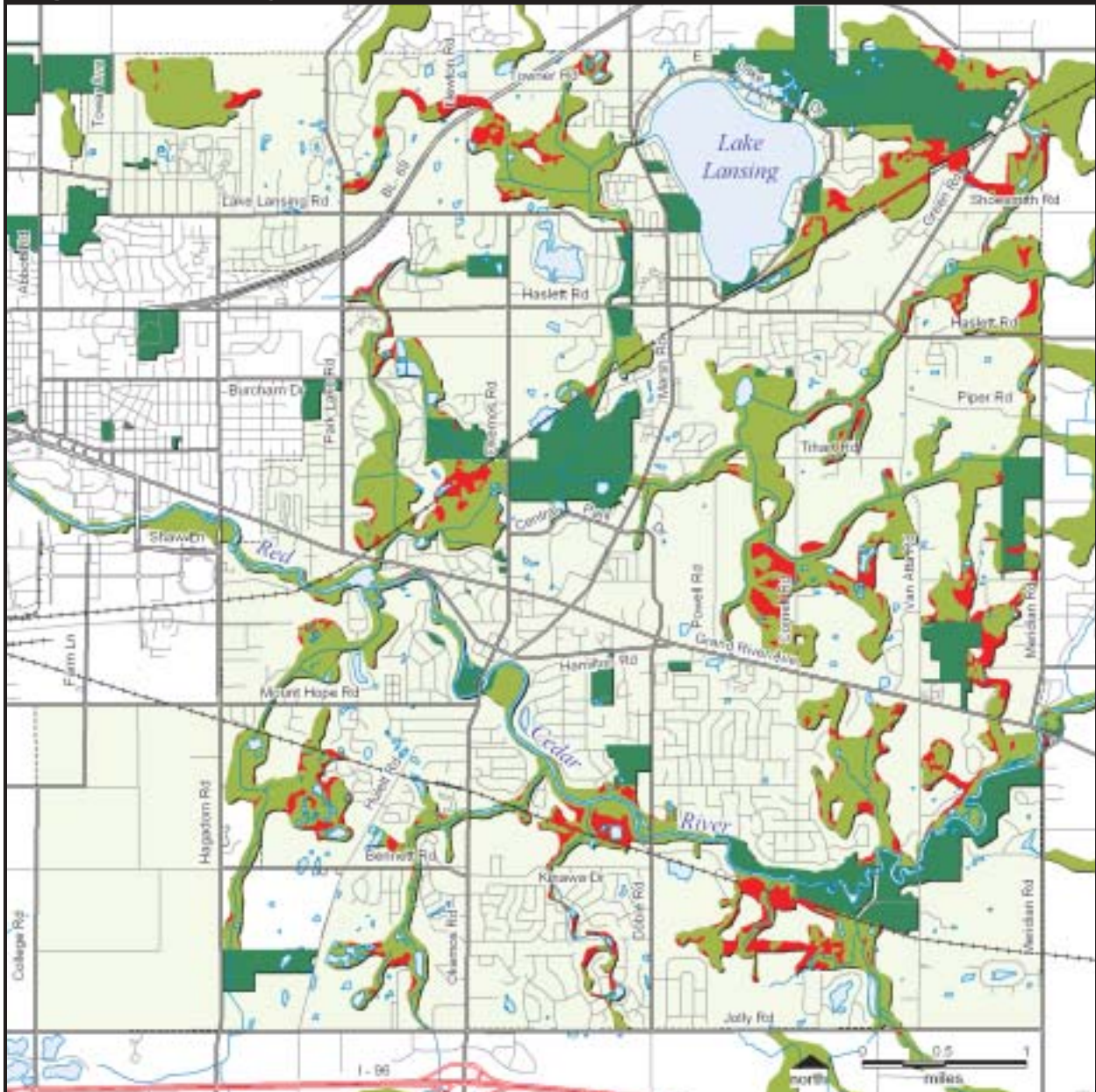
The PCCs have been primarily derived from the ecological analysis documented in Section 4 of the Appendix. High-ranking areas of the ecological analysis were hand-digitized into PCCs. These are areas that are likely to include significant habitat resources such as riparian corridors, wetlands and their adjacent upland buffers, and rare forest cover types occurring in undeveloped areas.



To make sure the integrity of the system was maintained, the PCCs also include land that may not be pristine habitat but nevertheless is important to the overall system. These are often critical links that connect areas of high-quality habitat and serve to maintain the functional integrity of the network. In some cases these are “Areas of Special Concern” that could benefit from restoration or other protection measures. The Areas of Special Concern are discussed in more detail later in this chapter.

The map of the Priority Conservation Corridors is best viewed in the same light as a wetland map. Although the map represents a detailed inventory of important networks to maintain at a Township level, it is not intended to serve as a detailed map on a parcel level. It is designed to serve as a guideline for areas where further ecological analysis is needed in the cases of new development, and where conservation efforts can be targeted. The underlying principal is that the network should be seamless between parcels and developments. Therefore any significant deviation from the Priority Conservation Corridor plan should be well researched not only on any single site but also from the system perspective.

Fig. 4a. Priority Conservation Corridors



Legend

- Currently unregulated land within the Priority Conservation Corridor
- Currently regulated land within the Priority Conservation Corridor
- Parks and Open Space

This map shows Priority Conservation Corridors derived from high-ranking areas of the ecological analysis and aerial photographs of the Township. The total greenspace corridor, not including parkland, equals about 3760 acres or about 18% of the total township. The parkland in the township currently equals 1,318 acres.

About 84% of the Priority Conservation Corridors shown are currently regulated lands such as floodplains, wetlands, and wetland and lake buffers. Important upland linkages and hubs have been added to maintain the integrity and inter-connectedness of the ecological system. These areas are shown in red and make up approximately 600 acres of the Priority Conservation Corridors.

Priority Conservation Corridors

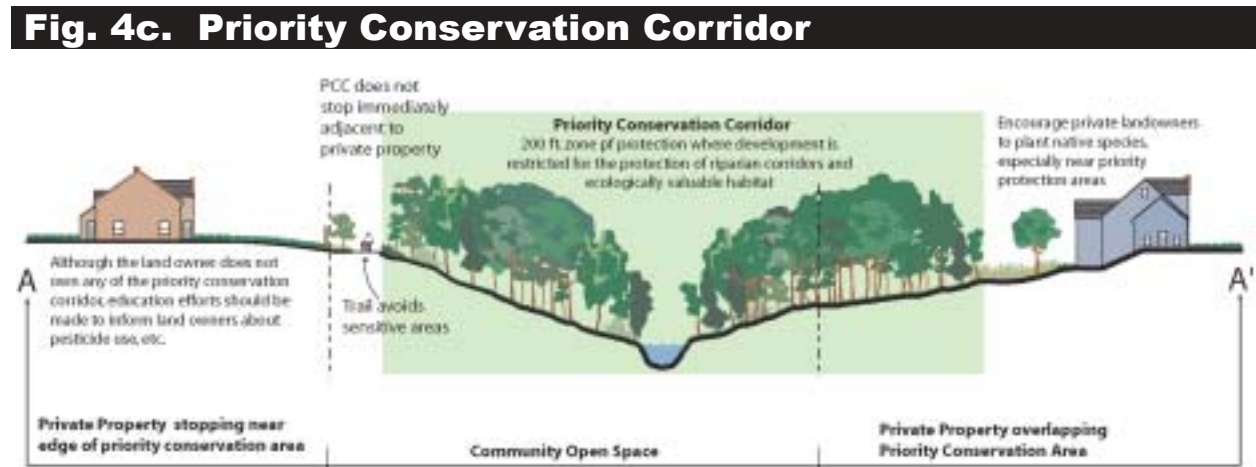
Design and Implementation Guidelines

Priority Conservation Corridors, shown in Figure 4b in dark green, span across existing development, private commercial developments, residential properties, and vacant land subject to new development. Land ownership of the corridor plays a large role in determining conservation methods used to preserve the corridor.

New development projects must be designed to preserve the integrity of the PCCs by clustering development within the parcel and preserving the corridors as community open space or deed-restricted private property.

Figure 4c shows the different ways of protecting the corridors through ownership and management. The property owners on the right own a portion of the PCC which is protected through conservation easements and or deed restrictions that limit uses of the property. The Township should work closely with these types of land owners to ensure compliance and educate the owners on voluntary stewardship measures.

On the left, the corridor is community open space, either owned by a neighborhood association or the Township. The Township should work with the community to educate home owners who live adjacent to the corridor and help the community set up voluntary stewardship activities for interested residents.



4.2 Scenic Road Corridors

Scenic road corridors are special routes in Meridian Township that are canopied, tree-lined, or afford beautiful views of the farmland and open space in the Township. These corridors were identified through the public input process, individual interviews, and the Township staff. Results from the public input strongly indicated that the agricultural views and canopied tree-lined roads, particularly in the eastern portion of the Township, were very important to the Township's identity. Inclusion of scenic road corridors in the Greenspace plan is intended to protect the character of the roadway and the views the roadway affords.

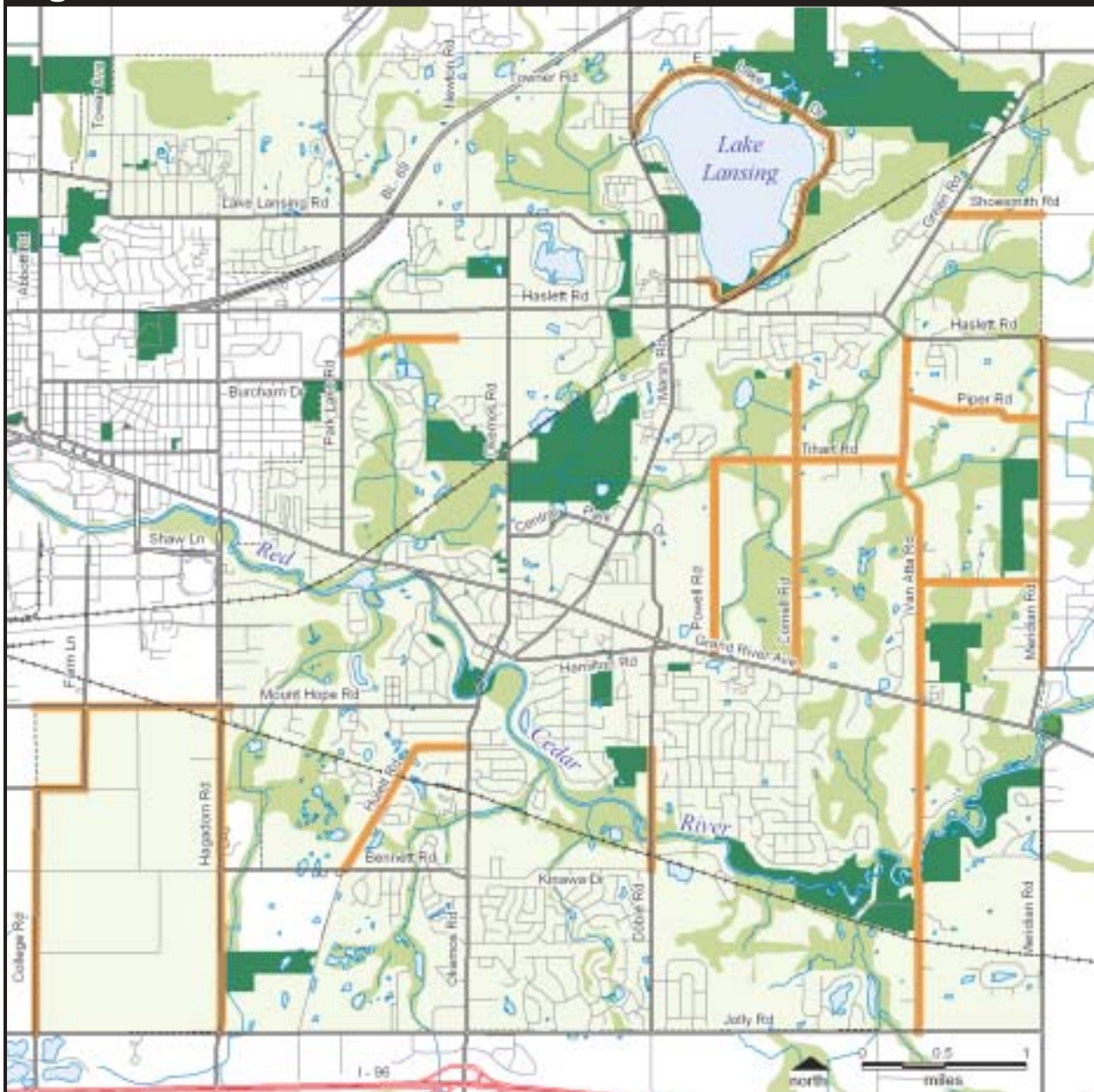
Just as with the priority protection corridors, land ownership of the corridor plays a large role in determining the implementation methods most effective for preservation of the scenic corridors. Because many of the road corridors are entirely owned by the Ingham County Road Commission, working with the county to manage the corridors is a critical component of protecting scenic views and canopied roads in Meridian Township.

Scenic road corridors are also designed to give protection to heritage trees that line the roadways. Heritage trees are mature native trees that help create a sense of identity for the township. More specifically, heritage trees are defined as trees or groves of trees having one or more of the following characteristics:

- Historical significance
- Outstanding specimen of a desirable species
- Possesses distinctive form, size, age, or location
- Trunk diameter 20" or more measured at 4.5' above natural grade of ground
- Designated by the Environmental Commission as part of the Meridian Township Heritage Tree Program



Fig. 4d. Scenic Road Corridors



Legend

- Scenic Road Corridors
- Priority Conservation Corridors
- Parks and Open Space

There are approximately 23 miles of road identified through public input, individual interviews and Township staff as scenic corridors in the township. A 150 foot buffer is recommended on either side of these roadways where new development activities are restricted.

Fig. 4e. Scenic Road Corridors



Scenic Road Corridors: Design and Implementation Guidelines

- ① Development is set back 150 ft. from the road where appropriate and changes in natural topography are utilized to preserve views across open space.
- ② Native species are planted to further shield views of houses across open fields.
- ③ New development along scenic roads should incorporate access control to limit disruption of canopied roads.
- ④ Supplemental plantings of native species can buffer the sidewalk from private residences and define transition between public and private space.
- ⑤ Sidewalk is set behind trees along canopied road to preserve vegetation.
- ⑥ Heritage trees are preserved.

4.3 Non-motorized Corridors

A non-motorized transportation system based on current best practices is important for the health, safety and general welfare of the people of Meridian Township. A well-implemented non-motorized transportation system that complements the natural areas in the Township will reap rewards by:

- Improving safety, especially for the young and old who are at most risk due to their dependence on non-motorized facilities and their physical abilities.
- Improving the economic viability of the Township by making it an attractive place to live or locate a business
- Reducing the water, air, and noise pollution associated with automobile use by shifting local trips from automobiles to walking, bicycling, or other forms of non-motorized travel
- Providing enjoyable routes that promote physical fitness

The Greenspace Plan includes a system of non-motorized corridors that provide linkages to hubs and sites. The non-motorized corridors outlined in the plan include on-road and off-road facilities such as shared-use paths, bike lanes, and sidewalks.

The non-motorized links are not intended to serve as a complete and comprehensive system for the Township but rather are meant to complement existing or proposed Township facilities and specifically work with the Priority Conservation Corridors and Scenic Road Corridors.

The following is a list of definitions of the various types of non-motorized facilities that are included in the plan:

Bike Lane - a portion of the roadway designated for bicycle use. Pavement striping and markings along with signage are used to delineate the lane.

Bike Route - a signed route intended as an aid to help bicyclists find their way to a destination where the route is not clear or where there is an alternative route ideal for bicycles that is not obvious. Bike routes may consist of any single type or combination of facilities such as shared roadways, shared-use paths, bike lanes or paved shoulders.

Sidewalk - A paved walkway separated from the road for use by pedestrians. Bicycle use may also be permitted.

Shared-use path - a pathway that is a minimum of 10' wide, separated from the roadway by an open unpaved space or barrier. Shared-use paths can also be completely separate from the roadway, for example, along an old railroad corridor or through a park.

Foot Trail- an unpaved pathway for the exclusive use of pedestrians. These are often indicated through environmentally sensitive areas.



Fig. 4f. Non-Motorized Corridors



The map shows the suggested non-motorized transportation corridors for the Greenspace Plan that are designed to compliment existing and proposed non-motorized facilities within the township. For a map of the existing and proposed non-motorized facilities in the Township, see Figure 2h in Section 2 of the Appendix.

Off-road routes are shown paralleling most of the CN and CSX railroad right-of-ways. These pathways may be constructed on a combination of leases from utility corridors and trail easements from private landowners. Should either railroad abandon the line, the Township and adjacent communities should aggressively pursue a rails-to-trails conversion as both corridors provide excellent transportation and recreational linkages.

Non-Motorized Corridors:

Design and Implementation Guidelines

The majority of the non-motorized facilities in the plan fall into two categories. The first category is facilities recommended in the road right-of-way. While a comprehensive non-motorized analysis of the on-road facilities needed for the township was not within the scope of the project, some general strategies for implementation of the on-road facilities are included.

Including proposed on-road facilities on the Township Comprehensive Development Plan can increase the probability that they are incorporated into County road improvement plans. The Ingham County Road Commission designs and schedules road improvement projects many years in advance. The Township staff should work closely with the Ingham County Road Commission to ensure these non-motorized facilities receive the proper attention they deserve early on in the project planning stages.

The second major category of recommended facilities are links suggested across property that is currently owned by development corporations and slated for future development. Again, early identification of these desired facilities and inclusion of them on the Township Comprehensive Development Plan will improve the likelihood of their realization. Because trails and pathways can increase the desirability of new residential neighborhoods, many developers are amenable to including non-motorized public access if it can be incorporated into the development plans early on. However, retrofitting already developed or designed neighborhoods is much more problematic due to potential opposition from a few established residents. The Township should work with developers in the early site planning and design phases to ensure the desired links are maintained.

Where a non-motorized corridor is associated with a new development project, the ideal is to have an off-road pathway that is adjacent to the Priority Conservation Corridor. This is something that may not be necessarily mandated by the Township. The Township should encourage the developer to consider this option. Because these pathways are sought after amenities by homeowners, many developers may provide the non-motorized corridor. Should that not be the case, the Township can and should mandate that a series of sidewalks on both sides of the road be accompanied by a signed Bike Route consisting of a shared roadway or bike lanes to provide the same non-motorized connections. These would include connections via stub roads or short connection pathways to future developments.

Fig. 4g. Road/ Path Intersections

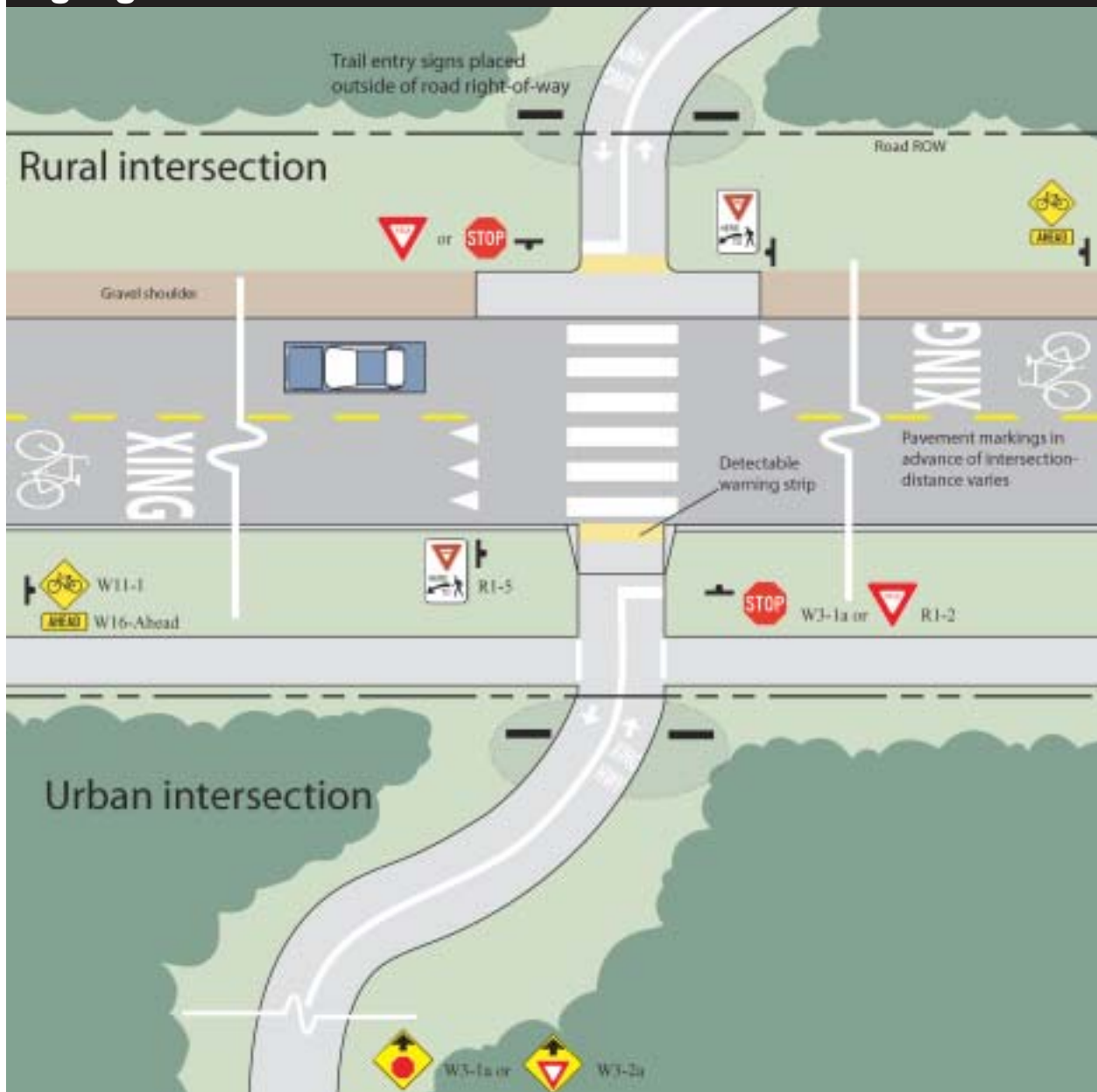
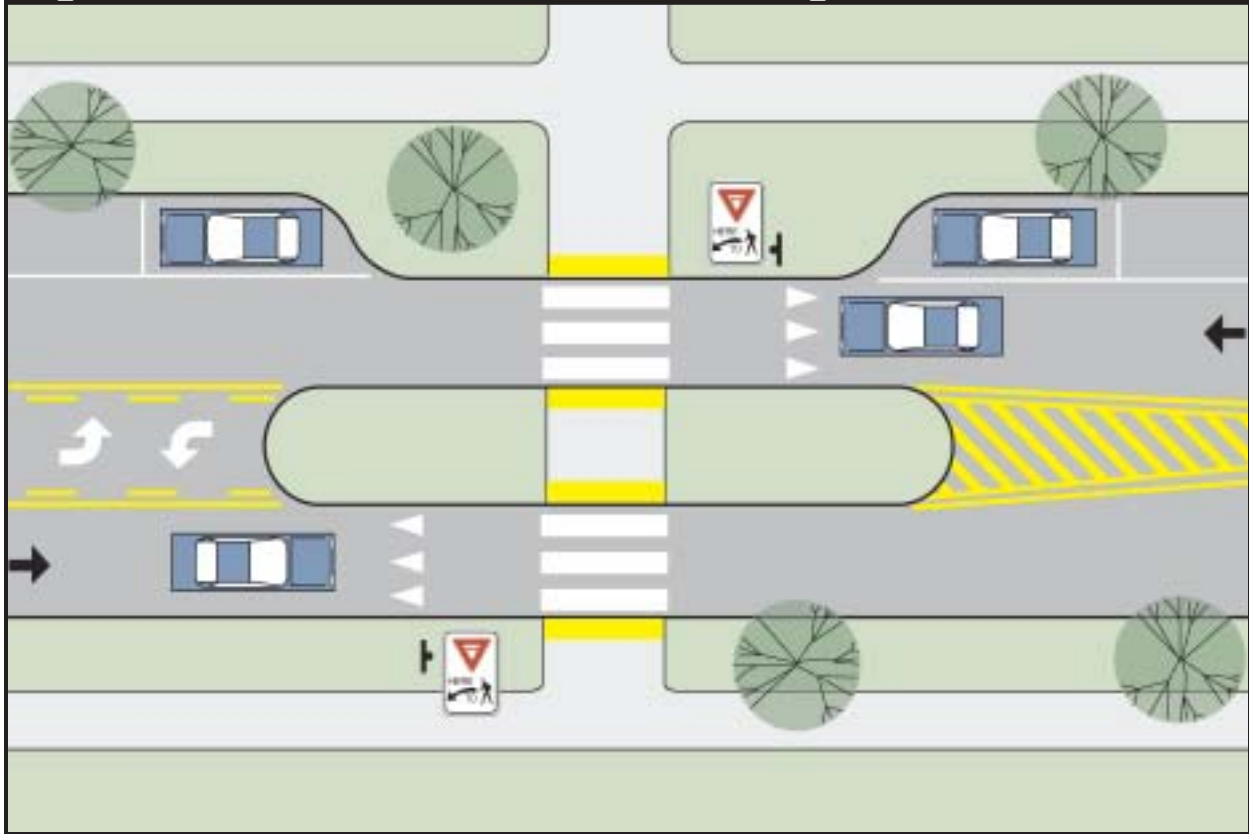


Figure 4g illustrates key points for the safe design of the intersection of an independent pathway with a roadway:

- Clear signage that identifies user rights-of-way and notifies both the users of the pathway and the motorists that an intersection is approaching.
- Pavement markings at the beginning of the trail intersection notify users of direction of travel and rights-of-way.
- The pathway should meet the roadway at as close to a 90-degree angle as possible for maximum visibility.
- Trail entry and identification signage is set back outside the road right-of-way.
- Regardless of the surfacing material of the trail, asphalt or concrete should be used for the portion of the trail that intersects the road to increase traction for bicycle users and cut down on debris from the road shoulder.

Fig. 4h. Mid-block Crosswalk with Refuge Island: 2-Lane Rd



Description:

Pedestrian refuge islands should be added to roadways that exceed four lanes. Refuge islands are raised areas that separate lanes of opposing traffic, eliminating the need for pedestrians to cross more than one direction of traffic at a time.

Refuge islands allow the pedestrian to undertake the road crossing in two separate stages. This increases their comfort level and opens up many more opportunities to safely cross the road.

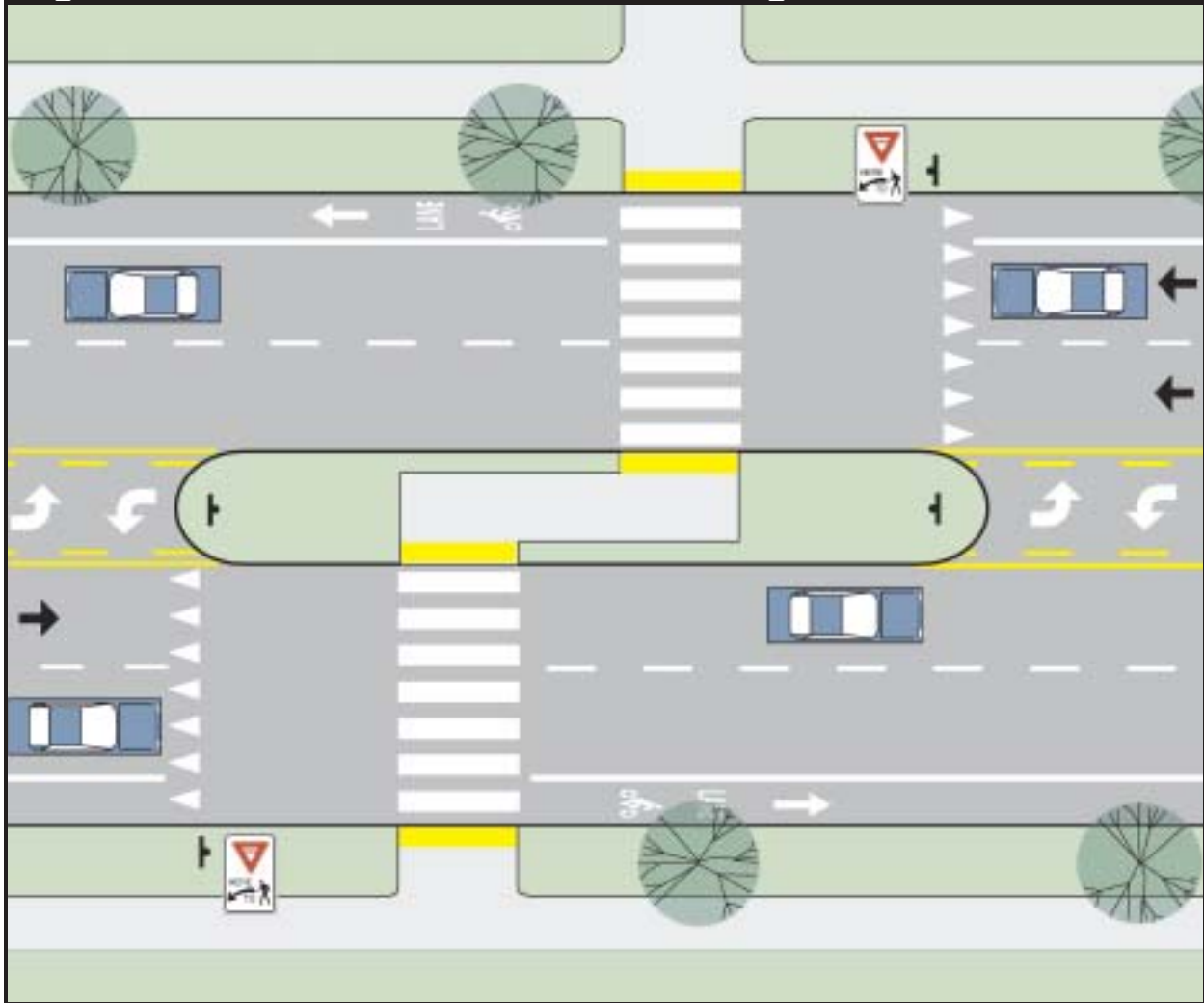
Refuge islands increase the visibility of the crosswalk to motorists and reduce pedestrian crossing distances. Refuge islands also have the benefit of reducing vehicle delay because more users can cross at gaps.

Figure 4h illustrates the design of a safe mid-block crosswalk for a two-lane or three-lane road at an unsignalized location with or without parking. The treatments shown should be used in conjunction with advance warning signs (not shown).

Key Elements:

- The yield markings are set back from the ladder crosswalk to minimize the potential for a multiple threat crash.
- Where crossings signs other than the R1-5/ R1-5a “Yield Here to Pedestrians” are used, yield bars should be omitted.
- A 2’ wide detectable warning strip is used at the base of the ramps.
- A bulb out extends the pedestrian ramp into the sightlines of oncoming vehicles, reducing the potential for a “dart-out” type crash.
- A refuge island is provided to break the crossing into two separate legs. The island has a minimum width of 6’ with 11’ or wider preferred
- Planting on refuge islands should be kept low so as not to obstruct visibility.

Fig. 4i. Mid-block Crosswalk with Refuge Island: 4-Lane Rd



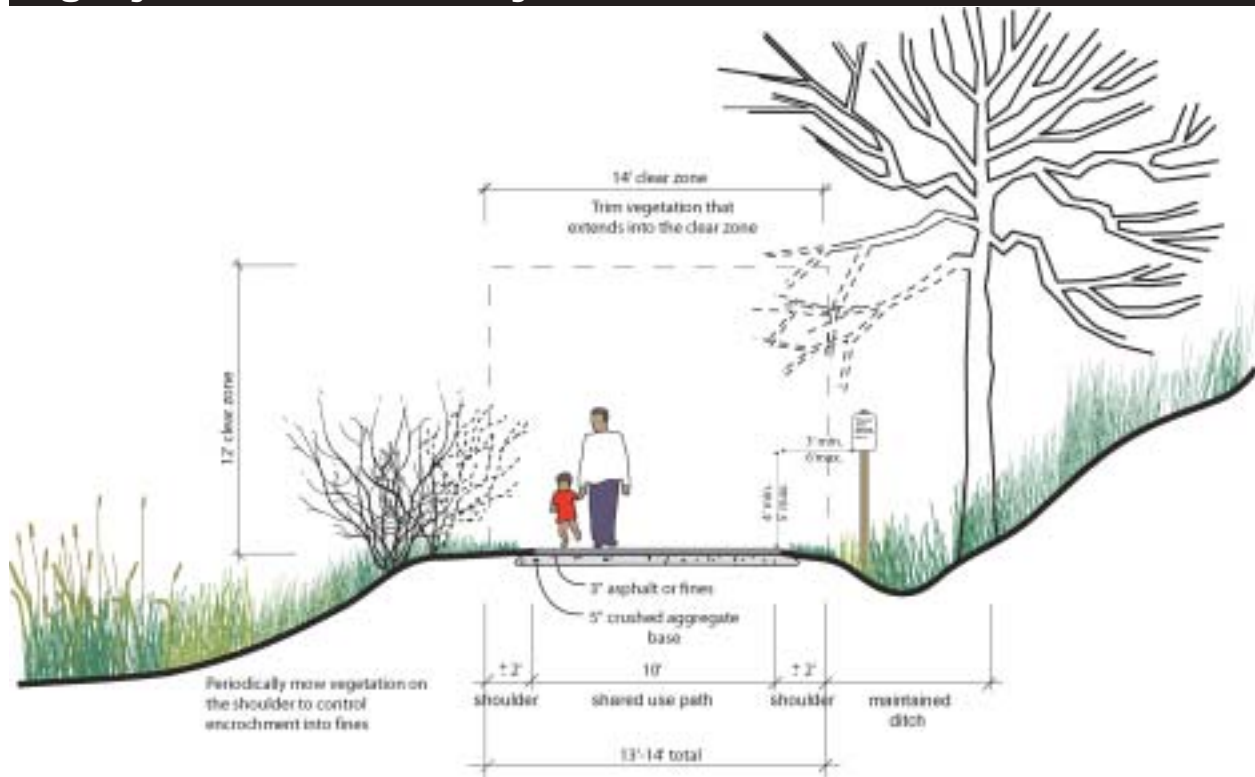
Description:

Figure 4i illustrates the design of a mid-block crosswalk at an unsignalized location for a four or more lane road with bike lanes. The treatments shown should be used in conjunction with advance warning signs (not shown).

Key Elements:

- The crosswalks are staggered to direct pedestrians' line of sight towards oncoming traffic.
- Yield markings are set further back to improve pedestrian visibility from both lanes and minimize multiple-threat crashes
- See additional key elements listed under Figure 4h.

Fig. 4j. Off-Road Pathway



Off-Road Corridors

An important part of the Meridian Township non-motorized system is the expansion of an independent pathway system that is separate from the road system. Independent pathways include rail-to-trail corridors, paths through parks and other trail systems. If designed and maintained properly, these pathways can be the “jewels” of the Township’s non-motorized transportation system.

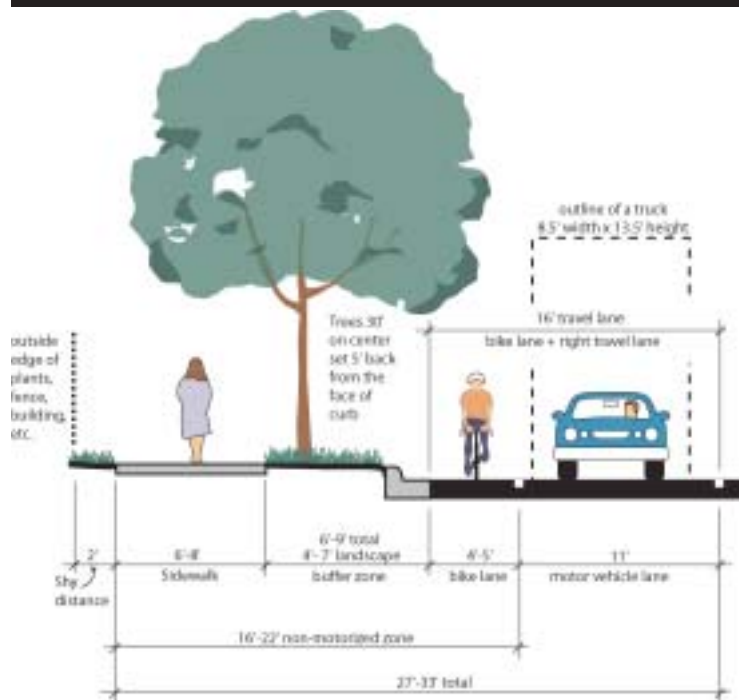
- Independent pathways should be designed to accommodate shared uses including bikers, walkers, strollers, rollerbladers, and people in wheelchairs. The pathway must be built wide enough to accommodate these shared uses. A 10’ wide path is the minimum width for a shared-use path. 12’-14’ wide is preferred in many cases in urban and suburban areas.
- Whether the surface of the path is asphalt, crushed limestone fines or other material, it should have a solid base and positive drainage as the path may have maintenance vehicles on it at all times of the year.
- The vegetation along the trail should be regularly trimmed and mowed to maintain a clear zone around the trail.

On-Road Corridors

A “non-motorized zone” comprised of a bike lane, a buffer zone with street trees, and a sidewalk should be established along both sides of most collector and arterial streets. This combination of non-motorized facilities is considered “best practice” and the safest way to accommodate bicycles and pedestrians along the road corridor in most situations. The Draft AASHTO guide for the buffer width that is shown in Figure 4k should be considered the minimum that is allowed.

Bicycle use of sidewalks by adult cyclists should be discouraged except in parkway conditions where there are minimal intersecting driveways and roadways, and where the sidewalk bikeway has been specifically designed to accommodate bicycle travel.

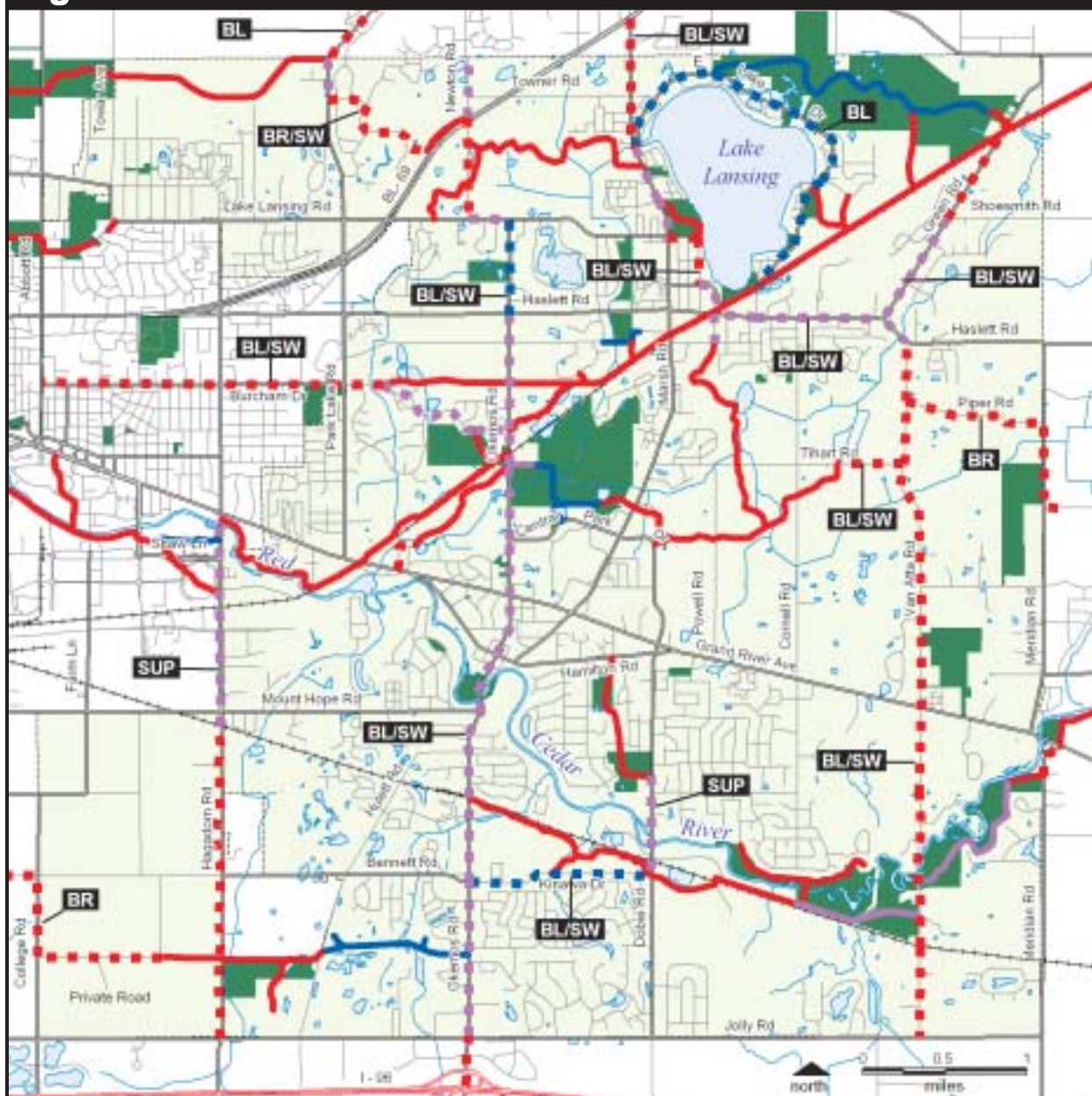
Fig. 4k. Non-motorized Zone for Collector and Arterial Roads



The following table summarizes criteria used to define road categories and the corresponding AASHTO guidelines for bike lanes and sidewalks:

Generalized Road Conditions and Existing Guidelines			
Criteria	Principal Arterial	Minor Arterial	Urban Collector
Generalized ADT	30,000	20,000	10,000
Average number of lanes	4	4	2
Average posted speed	40 mph	35 mph	30 mph
Draft AASHTO sidewalk width guidelines	6' Minimum 8+' preferred	6' Minimum 8' preferred	5' Minimum 6' preferred
Draft AASHTO buffer width guidelines	5' Minimum 6+' preferred	5' Minimum 6' preferred	2' Minimum 4'+ preferred
AASHTO bike lane width guidelines (see guidelines for specifics under different conditions)	5' minimum including width of gutter	5' minimum including width of gutter	5' minimum including width of gutter

Fig. 41. Status of Non-motorized Corridors



- Non-motorized Corridors**
 Outside Road Right-of-Way:
- Existing
 - - - Partially Existing
 - - - Proposed
- On or Adjacent to Roadway:
- ■ ■ ■ Existing
 - ■ ■ ■ Partially Existing
 - ■ ■ ■ Proposed
- BL** Bike Lane
BR On-road Bike Route
SW Sidewalk
SUP Shared-use Path
 See Definitions on Page 18
- Parks and Open Space

Figure 41 shows the status of the non-motorized facilities suggested in the plan, many of which are partially existing. For example, on Okemos Road, bike lanes and sidewalks are suggested as a means for accomodating pedestrians and cyclists. Sidewalks exist for much of the way along Okemos Road, but bike lanes should be added as well.

Some facilities can be implemented by restriping the roadway and/or addition of signage. Some will require implementation at the time of reconstruction or widening of the roadway.

Bike Route Implementation

A bike route is a designation that can be applied to any of the different types of facilities including shared roadways, shared-use paths, bike lanes or paved shoulders. It is intended as an aid to help bicyclists find their way to a destination where the route is not clear or where there is an alternative route ideal for bicycles that is not obvious. As they are navigation aides, bicycle routes signs should be accompanied by destination information. Also, as the sign indicates that a route is preferable for a bicycle to use,

**Fig. 4m.
Bike Route Sign**



hazards to bicycling should be removed and a route should receive maintenance levels conducive to safe bicycling. An example of a bike route sign with destination is shown in Figure 4m. Signed bike routes indicate to cyclists that the street is a favorable route for bikes and efforts have been made to adjust traffic control devices such as signal timing to give greater priority to cyclists on the road.

Bike Lane Implementation

Incorporating bicycle lanes is often a compromise between the ideal motorized transportation facility and the ideal bicycle facility in order to establish a true multi-modal facility within existing infrastructure limitations. Waiting for a complete road reconstruction at which time the “ideal” scenario may be applied would result in unnecessary delay in implementing a bicycle lane system. Also, in many cases, existing development and natural features dictate that the roadway width will

change little if at all even in the long run. Hence, approaches to modifying facilities that work within existing curb lines and with existing storm sewer systems may need to be employed.

Below are several options for modifying existing roads to accommodate bike lanes:

Lane Narrowing

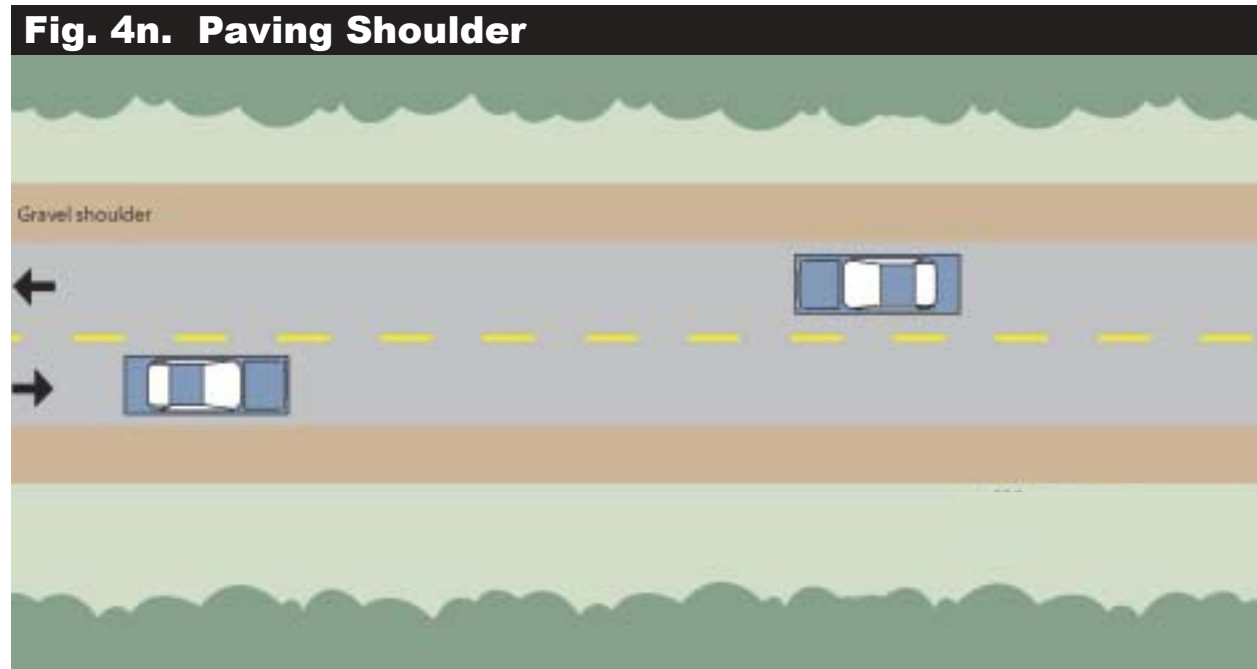
In some cases, existing travel lanes may be narrowed to accommodate bicycle lanes. In other cases there may be excess road capacity that permits eliminating a lane in order to accommodate bicycle lanes. Many cities have narrowed their travel lanes to 10’ wide lanes to accommodate bicycle lanes, as is permitted by AASHTO guidelines. While an 11’ wide lane is preferable, 10’ lanes can and do work. Narrowing travel lanes to accommodate bicycles has the added advantage of calming traffic. In general, lane narrowing to provide for bicycle lanes may be considered in the following situations:

- 27’ or wider 2 lane road
- 37’ or wider, 3 lane road (2 lane road with a center turn lane)
- 42’ or wider, 2 lane road with parking on both sides
- 48’ or wider, 4 lane road
- 52’ or wider, 3 lane road with parking on both sides
- 60’ or wider, 5 lane road

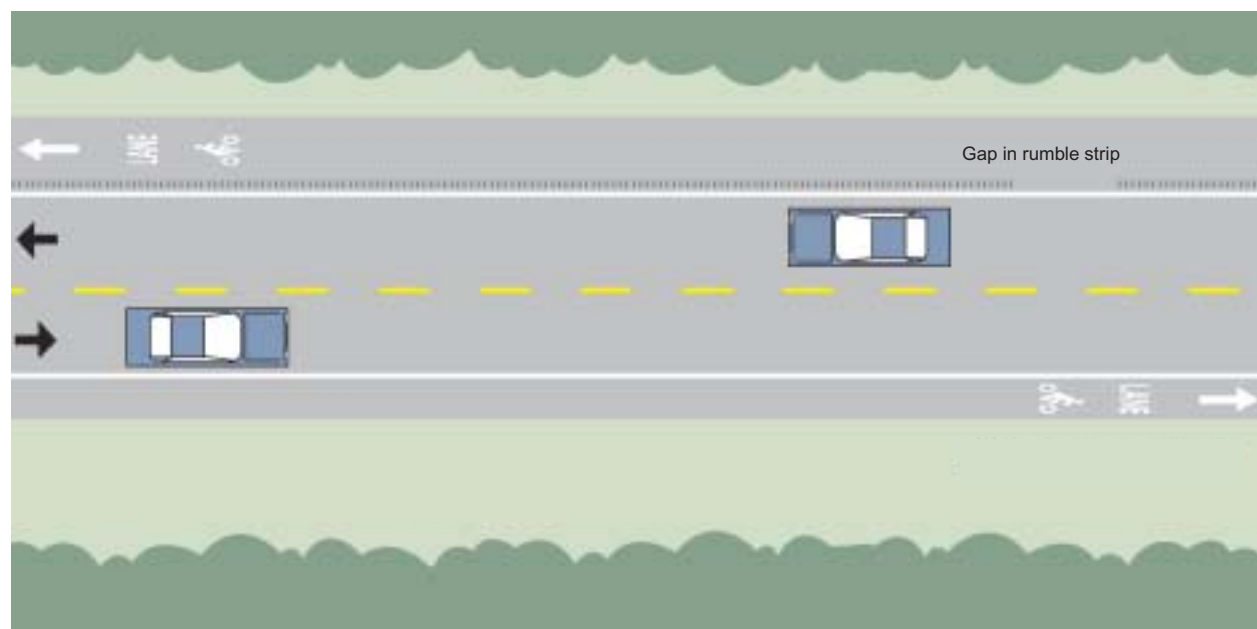
Higher speed roads may require an additional width. The narrowing of 4 and 5 lane roads to accommodate bike lanes has some specific conversion issues. Given the higher volumes of traffic, higher speeds and higher number of heavy vehicles on many of these roadways, it is desirable to keep the lane widths as close to an 11’ minimum as possible.

Paving Shoulders

Paving the shoulder provides a separate bicycle facility and improves roadway conditions from a motor vehicle and maintenance standpoint. The use of rumble strips is discouraged as they may cause a bicyclist to lose control when they leave the bicycle lane to make a turn or to avoid an obstacle. If extenuating circumstances call for the use of rumble strips, breaks should be provided where appropriate to allow for bicycle to safely leave the bike lane.



A rural cross-section (no curbs) with gravel or grass shoulder. The existing roadway travel lanes are not of a sufficient width to accommodate bicycle lanes by lane narrowing.



Shoulder is paved to accommodate bike travel. Slightly wider shoulders are included if rumble strips are used..

4.4. Areas of Special Concern

The Areas of Special Concern are portions of the Priority Conservation Corridors that merit special attention. These include:

- **Remaining Agricultural Areas** - where private property owners desire to keep their land actively farmed.
- **Road Crossings** - where the Priority Conservation Corridors intersect with major roadways
- **Fragile Linkages** - where the Priority Conservation Corridor is exceptionally narrow or fragmented.
- **Restoration Link** - areas where no conservation corridor currently exists but there is potential to establish a corridor with the redevelopment of a few key parcels.

For each of the areas indicated, special design and implementation guidelines are provided. Because of the unique nature of these areas, the implementation tools used are different than what would be used for established and intact corridors.

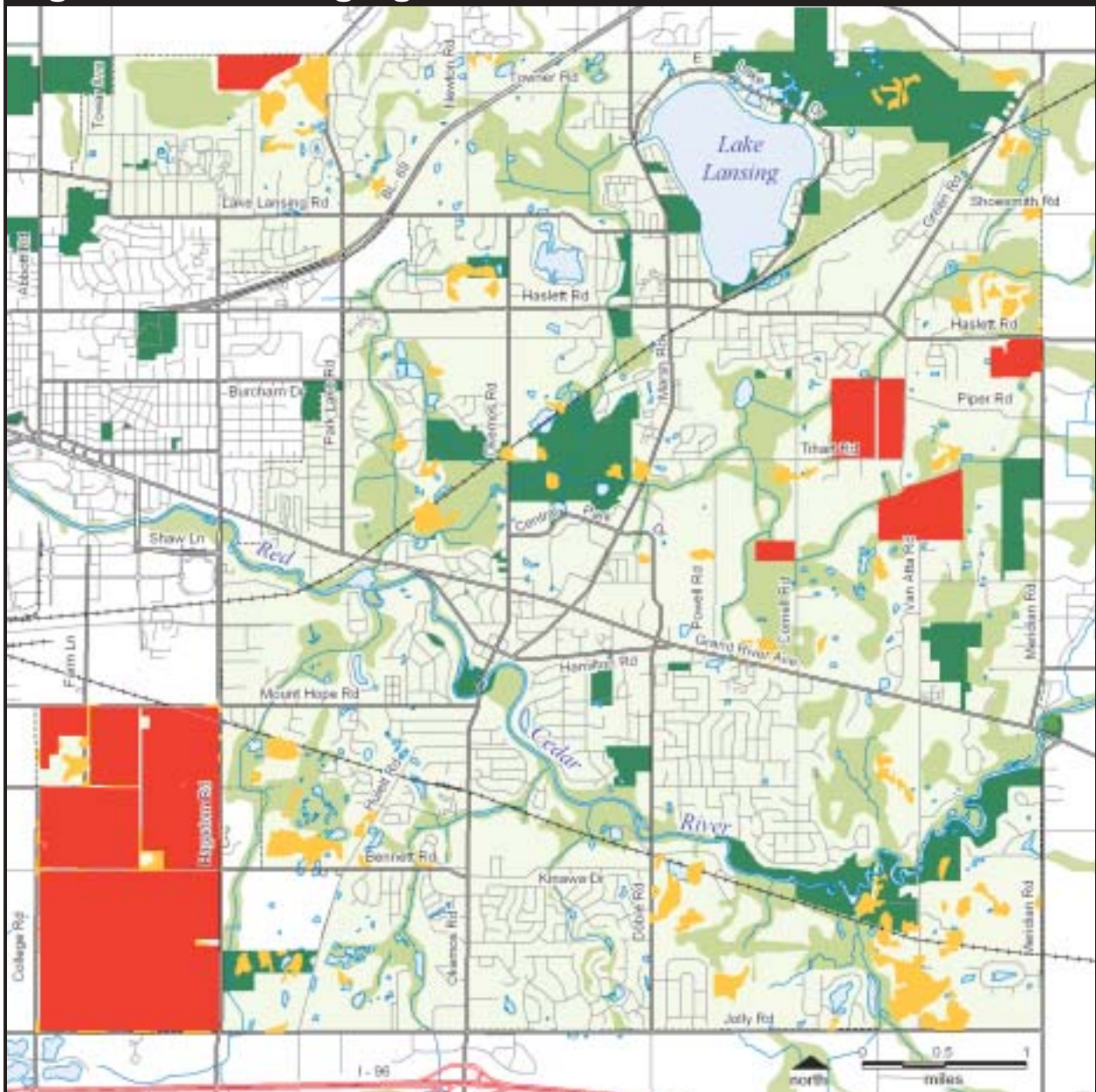
4.4.1. Remaining Agricultural Areas

While agriculture is not a prevalent land use in Meridian Township, there are 363 acres outside of MSU ownership that are classified as having agricultural land uses including a family farm, a sod farm, and a commercial greenhouse. There are 982 acres of prime farmland soil classifications within the Township. The primary tool for preserving agriculture is Purchase of Development Rights. This requires a willing seller and is therefore difficult to plan specific areas. Given the limited agriculture in the Township and the strong community desire to preserve the agricultural heritage, the Township should entertain preservation proposals for all existing farmland and for areas that are not currently being farmed but that have significant amounts of prime farmland. The preservation of farmland is desirable not only from an aesthetic standpoint but also from a long-term view of the sustainability of the landscape by minimizing the energy cost of food transportation.

Funding for the Purchase of Development Rights may be pursued through national or state programs. The Township should provide technical assistance if requested to assist those seeking funding from outside sources. In addition, if a parcel is not eligible or unlikely to be funded by an outside funding source, the Township should consider funding the Purchase of Development Rights.



Fig. 4o. Remaining Agricultural Areas



Legend

- Agricultural land use: family farm, sod farm, commercial greenhouse, or MSU agricultural research
- Nationally Significant Prime Farmland Soil Classification
- Priority Conservation Corridors
- Parks and Open Space

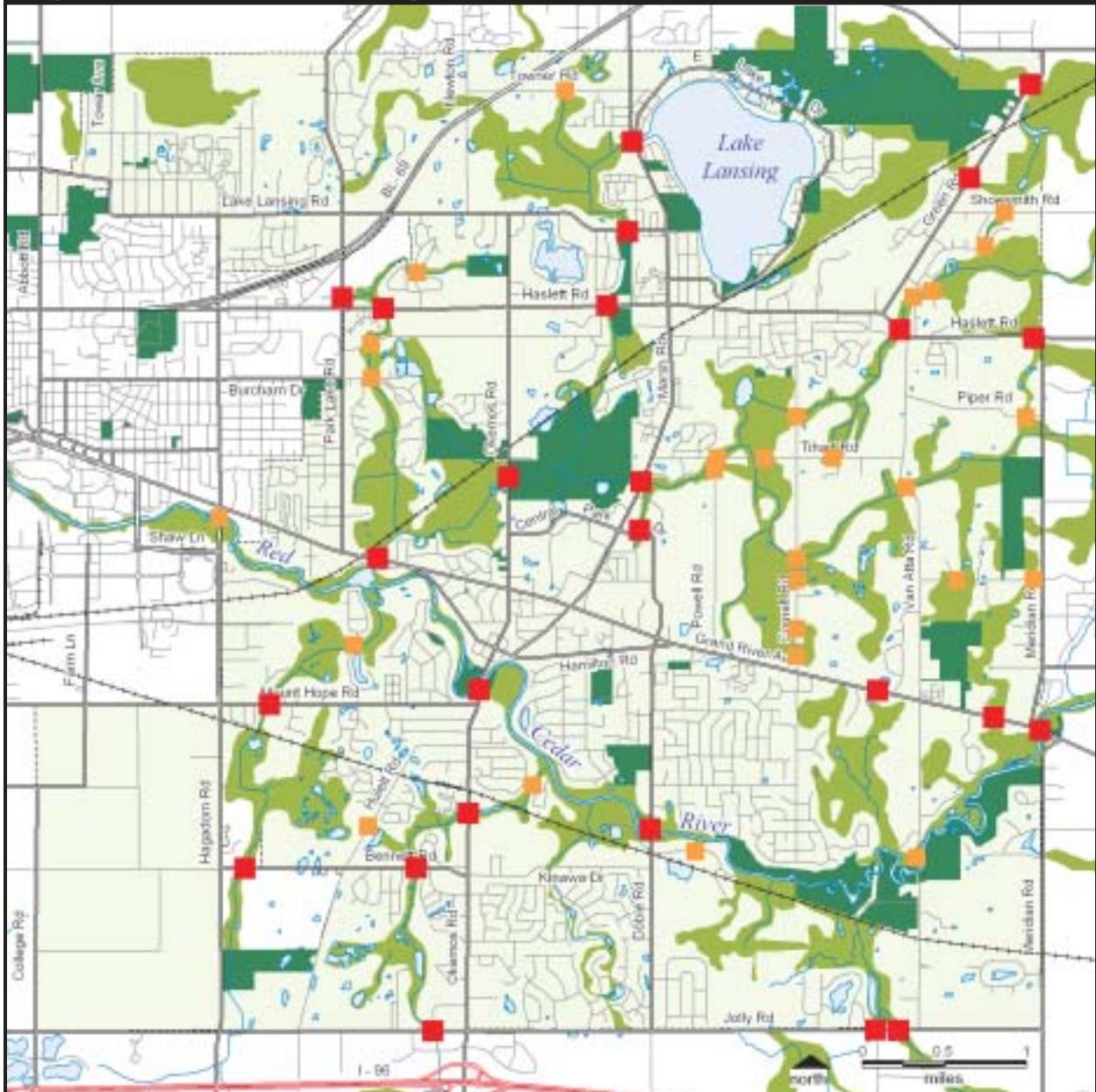
4.4.2. Road Crossings

As new development continues to occur in the Township, wildlife habitat and migration movements will be further concentrated within the Priority Conservation Corridors. Where these corridors intersect with roadways, especially high volume roadways, there is a significant chance of animal and motor vehicle collisions. The crashes can have a large impact on wildlife populations and the damage to motor vehicles and injury to motorists can be significant. Mitigation of these impacts can be accomplished through design measures both along the road, and below it. Figure 4p shows the location of Priority Conservation Corridors intersections with both major and minor road crossings.







Road sections such as this one may require mitigation to minimize impact of automobile/ wildlife conflicts

Fig. 4p. Road Crossings



Legend

-  Minor Road Crossing
-  Major Road Crossing
-  Priority Conservation Corridors
-  Parks and Open Space

Crossing over the Road

Large mammals such as deer, coyote, fox, possum, and raccoon will generally cross the surface of the roadway unless there is a substantial underpass. Strategic placement of wildlife fences at least 8 feet high prevent animals from crossing in dangerous areas with limited sight lines for motorists or along heavily used portions of the road corridors. The fences can be designed to effectively channel animal crossings to a narrow zone. “Wildlife Crossing Zone” signs should be used to alert drivers approaching the openings in the fences.



In addition to fences and adequate signage, wildlife warning reflector systems should be used at the crossing zones to reduce nighttime crashes with large mammals such as deer, coyote, or raccoons. These systems have been shown to reduce crashes with deer by 78%-90% percent. The reflectors work by refracting approaching headlight beams onto the sides of the road. Deer and other animals see unnatural moving lights and are dissuaded from crossing while cars are in the vicinity. After the cars pass, the lights disappear, providing a more environmentally sound alternative to continuous overhead lights that contribute to light pollution along the roadway. Figure 4q illustrates how a reflector system can be used in combination with fencing at critical crossing areas.

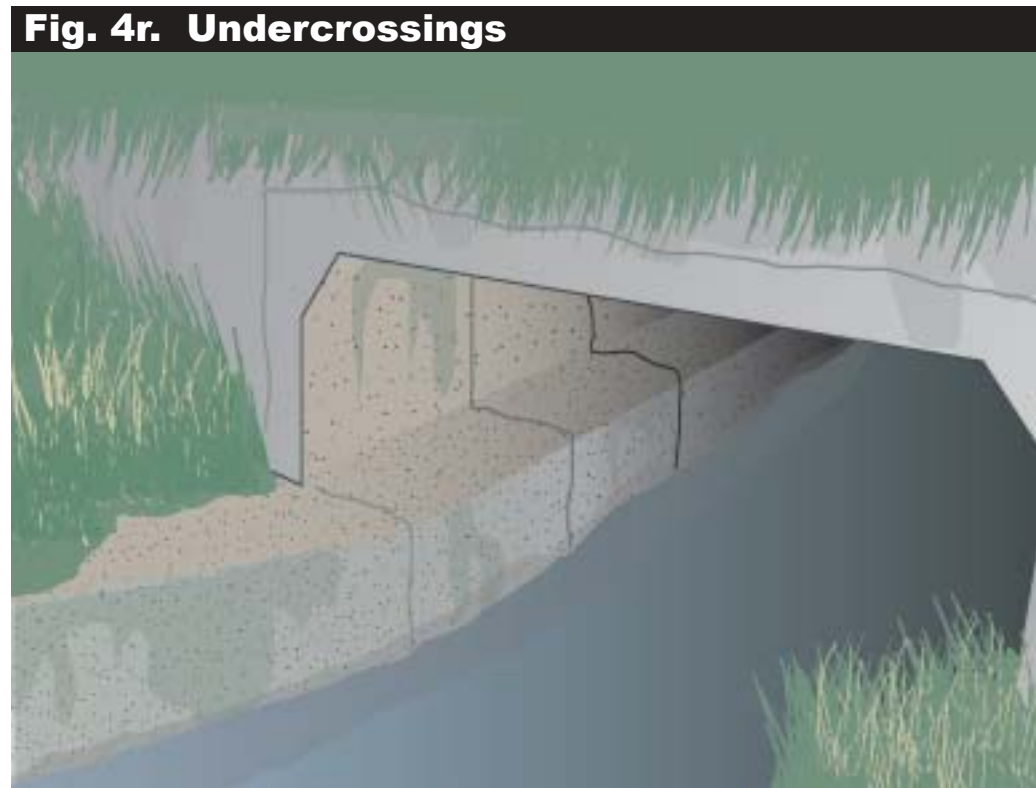
The reflector systems have been used successfully in both Calhoun County and Livingston County to reduce the incidence of deer-vehicle crashes. The Federal Highway Administration’s “Hazard Elimination Program” will fund up to 80% of the cost of the reflector systems. TEA-21 also provides matching funds for wildlife-road mitigation projects.

Undercrossings

In addition to large mammals crossing over the road, crossing for fish, reptiles, and small mammals need to be considered. Road crossings can have a severe impact on slow moving animals like turtles and salamanders. When given the opportunity, these animals can cross in below-grade culverts with special design features.

Many traditional structures such as culverts and bridges designed for roads can act as barriers to fish and other aquatic life. Existing roads should be retrofitted with specially designed culverts, fish ladders, or baffles that allow the proper water depth and velocity to accommodate aquatic life moving through the streams. Culverts should include ledges for terrestrial animals (Figure 4r). Undercrossings should be oriented perpendicular to the road to minimize crossing distances and should be large enough to have sufficient light shining through from opposite ends.

Several communities in Florida have effectively used low walls as deterrents in places with heavy amphibian and reptile crossings. The 3.5' walls are designed with a 6" lip at the top to prevent the animals from climbing over. The walls can be particularly effective in areas where there are special populations of amphibians and reptiles that need protecting. Silt fencing can also be used as an effective temporary alternative. The barriers should lead the turtles, snakes or frogs to safe undercrossing locations, as most likely they are attempting to cross to fulfill seasonal reproductive patterns. Amphibian and reptile barriers should be considered as an option for protecting migrating communities animals such as Blanding's Turtles across key road crossings within the Township.



4.4.3 Fragile Linkages

In places the Priority Conservation Corridor becomes very narrow as it winds through existing development. In these cases, the ecological health of the corridor is often threatened by the current management practices (or lack thereof) of the corridor. While these linkages have limited ecological value when viewed independently in their current state, they are critical to establishing a functioning network of conservation corridors. Therefore these fragile linkages need to be treated with extra care. Restoration and protection measures should be aggressively pursued in these highlighted areas.

In several places in the Township, a complete conservation corridor is not present but enough pieces exist that with some restoration, a Priority Conservation Corridor could be established. These potential corridors would be able to provide key linkages between hubs. In these cases, it is worth pursuing restoration of the corridor with existing landowners and especially if parts of the corridor are developed or redeveloped.



Through restoration efforts in collaboration with landowners, these riparian zones may be restored to create a stronger ecological system



Fig. 4s. Fragile Links



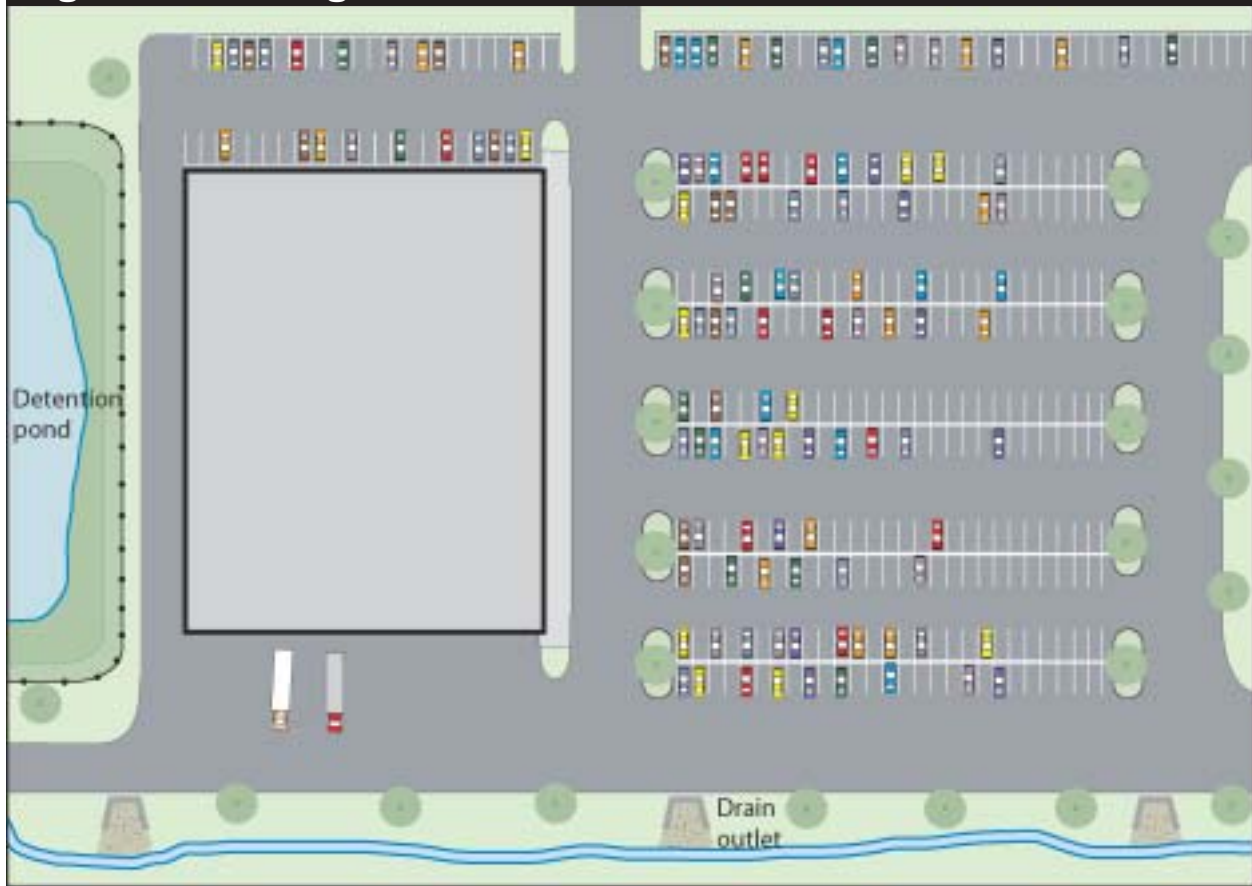
Legend

- - - Restoration Opportunities
- - - Highlights Fragile Links
- Priority Conservation Corridors
- Parks and Open Space

Fragile Links include areas where the Priority Conservation Corridors are exceptionally narrow or fragmented. The Fragile Links in Figure 4s have been identified using a landscape ecology approach to looking at the spatial patterns of the network as a whole. Links within the PCCs were highlighted where the greenspace network could quickly breakdown if these connected areas of greenspace were to disappear. The protection of these areas is critical to maintaining the overall functionality of the greenspace system.

Restoration Opportunities are areas where a Priority Conservation Corridor could be established in the future through restoration activities.

Fig. 4t. Existing Issues



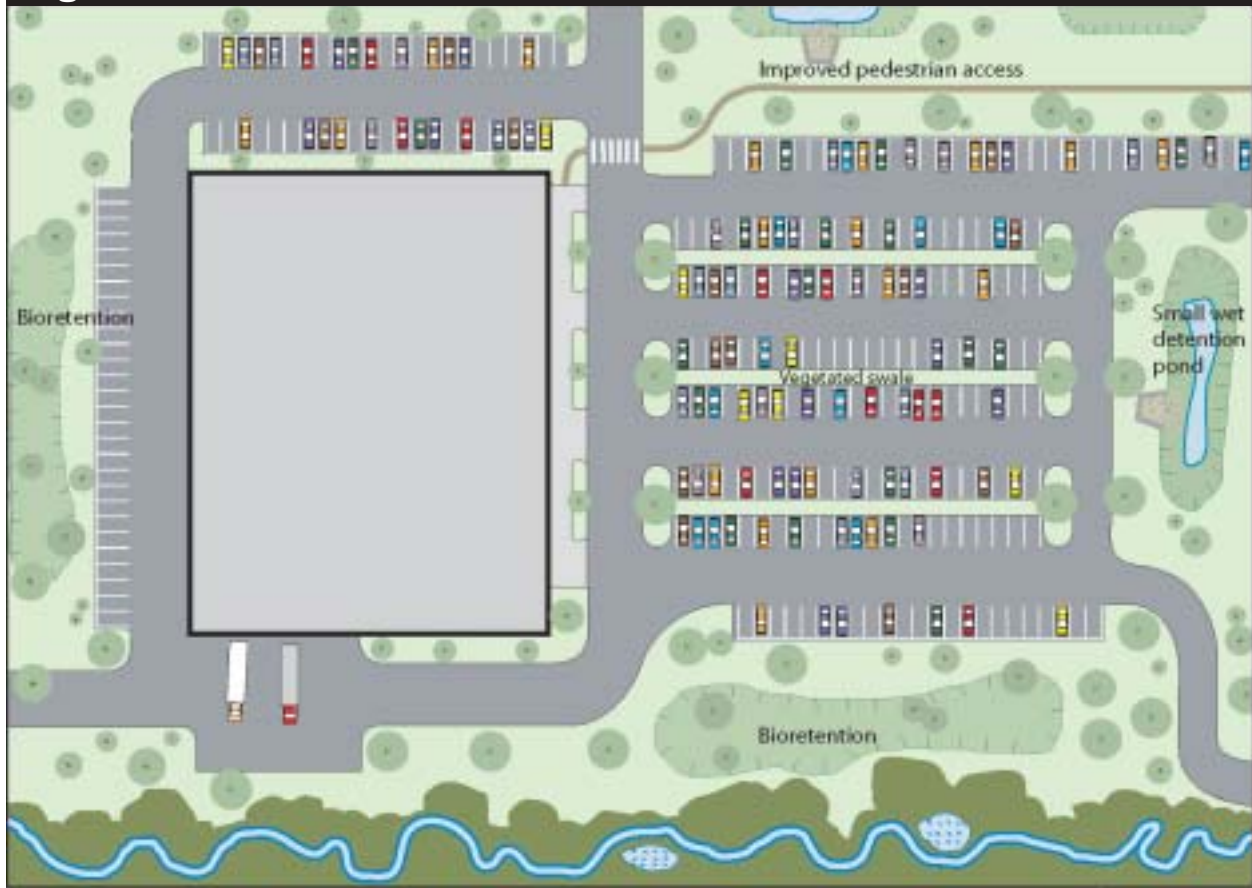
The following guidelines illustrate how fragile links within the Priority Conservation Corridors can be protected, mitigated, and in some instances restored to create a stronger greenspace network.

Figure 4t shows an example of a stream corridor that runs through a heavily developed area along side the parking lot of a large store. The fragile nature of the corridor can be alleviated through redesign of the parking lot and restoration of the corridor, shown in 4u.

Conditions weakening the ecological integrity of the stream corridor include:

- Vast expanses of impervious surface can negatively affect water quality of the entire watershed.
- Parking lots are often over-designed with many more spaces than are needed.
- The stream corridor runs through a strip of mowed lawn with little or no natural vegetation buffering the stream from parking lot run-off or slowing the flow of the water.
- Unfiltered stormwater empties directly into the stream.
- Large, deep fenced-in detention ponds, while important for protecting water quality are not aesthetically pleasing.

Fig. 4u. Potential Solutions



The fragile link can be restored through the following design solutions:

- Adjust parking lot standards to allow fewer parking spaces to reduce impervious surface.
- A combination of aesthetically pleasing bioretention ponds and detention basins filter run-off from parking lot or allow pollutants to settle out before the excess is released into stream corridors.
- Require native plantings around detention basin to filter run-off and improve parking lot aesthetics.
- Stream corridor is restored with a buffer of native vegetation and adjacent wetlands.

5. Implementation Tools

This chapter of the plan outlines a range of conservation tools and techniques. The implementation plan relies on seven general categories of protection tools. These tools are specifically chosen to address different conservation components and ownership conditions so each unique situation will have a tailored response that maximizes the effectiveness of conservation efforts.



5.1 Conservation Zoning

Conservation zoning is typically used as an overlay in addition to existing zoning that makes cluster development a mandatory condition, thereby protecting open space throughout the developing portion of the Township. Mandating the clustering of houses on a portion of the property can minimize the impact to natural resources and preserve an interconnected network of greenspace throughout the Township. An overlay zoning approach also minimizes the need to rezone large areas of the Township.

Conservation zoning mandates the protection and preservation of a portion of the buildable land of the parcel or parcels being developed for residential housing. 30% of each parcel or parcels is the recommended portion for Meridian Township. This 30% is in addition to the areas already protected by natural feature overlay zoning. The 30% open space dedication should in general coincide with Priority Conservation Corridors and Scenic Road Corridors. If the preservation intent of the Priority Conservation Corridors and Scenic Road Corridors can be met with less than the 30% dedication, the remainder of the dedication may be allocated towards active recreation uses, such as ball fields and play areas. The permanent protection of the dedicated open space may be undertaken through a number of means including a conservation easement, deed restriction, or transfer to public ownership.

Because the Priority Conservation Corridors and Scenic Road Corridors are defined at a Township level, an in-depth ecological analysis is required. The ecological assessment is required to determine how best to apply these concepts at the site level and also to identify key natural features. The ecological assessment would be prepared by the developer at their expense. The assessment could easily be integrated with the Land Clearing Application as that application already requires a detailed inventory of vegetation and information on what vegetation will be removed, transplanted or protected. The primary variation would be to indicate the priority conservation corridors and scenic road corridors on the required site plan as well as indications of the areas to be permanently protected.

A key principal of conservation zoning is that if a site would allow a certain number of units under the base zoning, that same number of units may still be permitted. The conservation zoning takes a fundamentally different approach to zoning than traditional zoning. In traditional zoning, the language calls out minimums for front, side, and back yard setbacks and lot size among other items. Conservation zoning in contrast, calls out minimum open space requirements and provides guidelines on the location and design of the open space, but leaves the yard setbacks and lot sizes up to the developer.

It is similar to a Planned Unit Development with the exception that the Township is not granted the same degree of site plan oversight. If for example, a developer were to submit a site plan that had the number of units allowed under the base zoning, complied with the open space requirements, followed the Priority Conservation Corridor guidelines, met the public road and utility requirements, and was based on a valid ecological assessment, the Township should accept the plan.

To avoid potential difficulties in the site plan approval process, the developer is encouraged to bring forward a sketch site plan for review by Township staff early in the process. Then any questions regarding interpretation of the conservation zoning may be addressed prior to the developer investing significant design and engineering time in the project.

The Conservation Zone ordinance is designed to provide a fair and equitable process for the developer. This conservation tool protects private property rights and allows development to continue in the Township while protecting an interconnected network of open space.



5.2 Conservation Easements

A conservation easement is a legal agreement that limits the type and amount of development that may occur on a property. A property owner voluntarily enters into an agreement with a public agency or non-profit organization that will hold the easement. The landowner retains the title of the property and the right to sell it, but future buyers are restricted to the conditions of the easement. A conservation easement holds no requirement for public access.

One of the advantages of the conservation easement as a conservation tool is its flexibility. The conservation easement may be tailored to the resources of the property and the owner's particular needs. The property owner works with the agency or conservation organization to outline the rights and restrictions of the easement. The easement can include the entire property or a portion of it. Donors of the easements are eligible for income tax, estate tax and/ or property tax benefits if the easement is negotiated for perpetuity.

Because conservation easements are voluntary, flexible, and usually entail tax benefits for the property owner, they are powerful conservation tools. Conservation easements can be particularly effective for business properties, where portions of the property are unused and the value of the business would not be affected by the restriction of further development on the land. They are an ideal tool for targeting Areas of Special Concern within the Priority Conservation Corridors to ensure permanent protection.

The Michigan Natural Resources and Environmental Protection Act of 1994, or Act 451, enables government entities within Michigan to hold and enforce conservation easements. The easement can be held exclusively by the Township, by a land trust, or both parties as "co-holders".

Before establishing a conservation easement-holding program, the Township should determine how the costs of the program will be covered. While donated conservation easements are a relatively cheap conservation tool, they are not cost free. Costs associated with the easements include:

- Creating and acquiring easements including legal fees, staff time, property appraisal, title insurance and an environmental assessment. While the initial cost of appraisal and survey are the landowner's responsibility, the Township may want to establish a reimbursement fund to landowners who donate property to encourage greater participation in the conservation program.
- Managing and enforcing easement - the property must be monitored on a regular basis to ensure compliance with the terms of the easement. This requires staff time and potential legal fees if there is non-compliance.

Most often, easements are donated, however, in certain cases they can be purchased. Conservation easements are the principle legal mechanism for protecting land in a Purchase of Development Rights program.

The Land Preservation Millage is a viable option for funding the establishment of a comprehensive conservation easement program in the Township to protect a large portion of priority areas identified by the Land Preservation Advisory Board, and the PCCs.

The Township should establish clear criteria for accepting conservation easements. Township staff can encourage land stewardship on private properties by targeting key landowners in the areas and informing them of conservation opportunities, particularly voluntary programs such as conservation easements. Public information sessions to discuss the financial incentives available for voluntary land preservation can be held by the Township, in large public talks or one-on-one meetings with interested landowners.



5.3 Trail Easements

A trail easement is a conservation easement established for the purpose of creating a trail for public use. The primary purpose of a trail easement is to provide public access. As already mentioned, being proactive and approaching developers to grant easements as part of the subdivision development process is an effective way to establish a viable trail system.

Although trail easements are a much more financially viable option for the Township than the outright purchase of corridors, care should be taken in crafting the easement to ensure long-term access to the corridor and minimize future conflicts. At a minimum, the trail easement should specify in writing the width and length of the trail corridor, type of use, and any restrictions the corridor is subject to. Each easement must be tailored to the trail and the property through which it is passing.

Specifications for the long-term maintenance of the trail should also be incorporated in the easement agreements. It is recommended that the Township establish a mechanism for overseeing the development of the non-motorized system in the Township, including trail development and maintenance. The pruning and maintenance of residential plants is particularly sensitive and clear guidelines should be established. Homeowners should receive notification when this maintenance is going to occur.

The formation of a new non-motorized advisory committee that can address Township-wide issues of non-motorized transportation planning and policy is recommended. The advisory committee should include Township staff representatives from the Police Department, Engineering and Public Works Department, Parks and Recreation Department, Community Planning and Development, bicycle and pedestrian citizen advocates, citizen advocates from the disabled community, and representation from the Township Board. The advisory committee can serve as a forum for addressing policy and implementation problems, public input, and inter-departmental coordination on non-motorized transportation projects.

A typical concern for landowners is the liability they face by allowing public access on their land. Michigan legislature has enacted a law that greatly limits the liability landowners face to encourage landowners to open trail access on their land. The Michigan “Recreational Use Statue”, part of the Michigan Natural Resources and Environmental Protection Act, gives landowners liability protection for people entering and using their land for recreational purposes. Landowners do not have to warn visitors of hazards on the land or the dangers of engaging in certain activities, or keep their property safe. However, the liability protection is not valid for landowners who charge access fees on the land or deliberately engage in activities to harm people.

In addition to pursuing easements across private property, the Township should pursue easements across

publicly owned state or county lands to ensure long-term protection and access to the trail systems.



5.4 Voluntary Stewardship Programs

For the Township to be successful in conservation, it cannot simply rely on regulatory measures, but should also focus on public education and implementation of a variety of voluntary stewardship programs. Getting people excited and involved in protecting the Township's resources on an individual level is one of the best ways to ensure these resources will be cared for in the long run. The Township can do many things to promote conservation efforts including sponsoring conservation programs and providing numerous opportunities for information and education through websites, lecture series, handouts or fact sheets about the natural resources in the Township. Below is a brief list of conservation programs and initiatives other communities are using successfully:

Awards Programs

Appreciating people in the community who have made outstanding commitments to conservation is a great way to recognize their contributions and inspire others to follow suit. Local awards programs can help bring recognition to landowners to promote stewardship efforts. The awards can be extended to include local businesses for initiating stewardship programs or restoration efforts.

Adoption Programs

A variety of Adopt-A-Stream programs are being used all over the country as an effective way to involve the community in protecting water resources and monitoring changes in water quality. Some counties or watershed councils have programs in which participating organizations adopt a stretch of stream or river within the community, much like the Adopt-A-Highway program. The groups are asked to commit to the program for two years and to clean up their sections at least twice a year. Other programs include strong environmental education curriculums. Classrooms focus on nearby waterways for stream restoration activities, field studies and learning scientific concepts such as water quality monitoring.

Another adoption program, called Adopt-A-Waterway is a national program which raises money to help local governments fund pollution awareness and prevention activities. Participating governments receive public service announcements and educational materials for distribution, as well as revenues from corporate sponsorship to help fund educational activities in exchange for posting corporate sponsor advertising in high traffic areas.

Information Access to Federal and State Programs

Many federal and state programs exist to help private landowners with conservation of ecological systems on their land. Some of these programs include:

Wildlife Habitat Incentives Program- this program provides financial incentives to landowners for creating fish and wildlife habitat on their lands. In exchange for a 5 to 10 year cost share agreement, landowners agree to implement a wildlife habitat plan.

The Federal Wetlands Reserve Program pays landowners to set aside permanent or thirty-year easements of wetlands on their property in exchange for a land payment and financial assistance.

Clean Sweep, a program through the Michigan State University Extension Service is a program that accepts leftover or unwanted pesticides from people. The pesticides are collected, packaged for safe shipping, and disposed of properly at no-charge.

Meridian Township can help residents take advantage of these programs by displaying existing information about the programs at the Township Hall and providing links to relevant websites from the Township's website.

Environmental Education

The Township can use newsletters to provide a continuing series on environmental issues and related opportunities for homeowners regarding the Greenspace Plan. Schools can structure special community service projects around some aspect of the greenspace plan or integrate the plan in a biology or earth science class.

Community Service Days

In conjunction with the Adopt-A-Waterway program, the Township can organize and schedule River Clean-ups and other community service activities to increase awareness of the issues.



5.5 Land Acquisition

Outright fee acquisition of property at market rate is an expensive conservation tool. It is a tool that is best targeted towards ecologically valuable lands and Areas of Special Concern. This tool can be effective and efficient when used with willing sellers who will offer the Township property at a bargain price because of their preservation ethics and financial standing. In these cases, special recognition is often in order.

The Land Preservation Millage of Meridian Township (.75 mills or approximately \$850,000 every year over 10 years) passed in 2000 has been a successful way to raise money for the purpose of land preservation. Some of the funds, which currently total about 2.1 million dollars, have already been used for a recent fee acquisition of ecologically valuable property along Haslett Road and plans to acquire further properties are in the works.



5.6 Purchase of Development Rights

Under a Purchase of Development Rights (PDR) program, a landowner can sell the rights to develop a parcel of land to a public agency or a private conservation organization. A conservation easement is placed on the land to prevent development, but the landowner retains ownership. Landowners may also receive property tax relief because the development rights, which can add significant value to the property, are now held in trust.

The PDR program can be a costly conservation tool. In areas of the Township that have intense development pressure and where real estate values are high, the cost of purchasing the development rights will also be high. Because of this, it is recommended that the purchase of development rights be limited to farmland preservation or ecological critical areas in the Township that are unique or are essential for maintaining the network of open space.

The first step in establishing a PDR program is setting up a funding mechanism for the program. Again, the Land Preservation Millage enacted by the Township is an excellent source of funding for a PDR program. Other sources include matching dollars from federal or state programs, bond initiatives, or taxation relief options.

Currently, PDR programs in Michigan are focused almost exclusively on farmland protection. Funding sources for farmland PDR programs can come from sources such as the Michigan Agricultural Preservation fund, or the USDA Farm and Ranch Lands Protection Program (FRPP).

State PDR grants for farmland protection are only available to Townships that have implemented a PDR ordinance. Development of a local ordinance designates how the funds will be allocated and which department will administer the program. The staff in charge will be responsible for developing program regulations, guidelines and criteria for land preservation. After guidelines are established, the staff solicits applications and ranks them based on the established criteria. An independent appraiser should conduct an appraisal of development rights.

Several Townships in Michigan have successfully implemented PDR programs for farmland preservation. In 1994, the residents of Peninsula Township voted to implement a PDR program that, since then, has raised nearly \$10 million dollars to purchase development rights from property taxes, state grants and private funders such as the Grand Traverse Regional Land Conservancy and the American Farmland Trust. Armada, Bruce, Ray and Richmond Townships in Macomb County have grouped together to form an intergovernmental Township agricultural PDR program, with more Townships in the county expected to come on board soon.

In other areas around the country, PDR programs have been used to protect farmland in addition to open space. In Loudoun County, Virginia, criteria for PDR eligibility are broken into two categories of analysis: farmland (agricultural) and non-farmland (non-agricultural). This was to ensure that areas within the highly fragmented and more developed eastern portion of the county would still be protected. Dutchess County, New York also has an PDR open space protection program in addition to their agricultural protection program requiring municipal funding support and participation in a regional greenway program by the local government. In Washington County, Minnesota, the Purchase of Development Rights program is targeted in “Green Corridor Opportunity Areas”. Much like the Priority Conservation Corridors identified in the Meridian Township Greenspace Plan, the “Green Corridor Opportunity Areas” were chosen through an extensive ecological analysis and public input process.



5.7 Linked Site Plan Approvals

The conservation zoning approach is limited in that it only addresses clustering development for a single development project on a single site. There will be cases where one development project may have substantially more of the site lying within a Priority Conservation Development Zone than another development project. To address this issue, some communities have put in place a Transfer of Development Rights program that allow the development rights to be partially or wholly transferred from one site to another.

While some Townships in Michigan have enacted a Transfer of Development Rights program, the legal standing of these programs is uncertain when employed by a Charter Township. One means to accomplish the same ends is permitting linked site plan approvals. The Township would permit two or more non-contiguous sites to be considered as one development plan. This would permit the optimum use of the conservation zoning open space dedication.

As the Township has numerous parcels held by large development corporations this may be an attractive option for those corporations. Also, special partnerships may be arranged between two developers. The advantage of the Linked Site Plan Approvals is that the Township would not have to facilitate the transfer of rights between two organizations. There is also precedent for Linked Site Plan Approvals in that many large development projects are comprised of multiple parcels that are not contiguous.

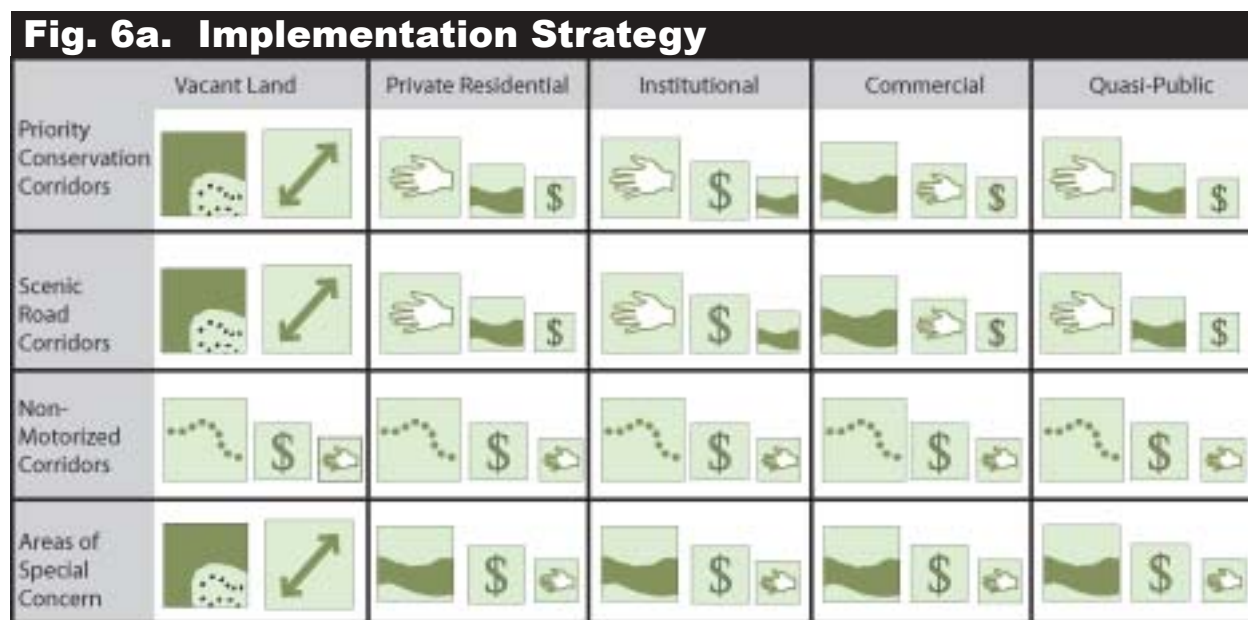
Another option, recently approved by the Michigan House of Representatives, is the allowance of non-contiguous open space to be used in a planned unit development. Public Acts 227, 228, and 229 of 2003 amend the PUD language to state “Unless explicitly prohibited by the planned unit development regulations, if requested by the landowner, a city or village may approve a planned unit development with open space that is not contiguous with the rest of the planned unit development.” This may open the door for local governments to establish a transfer of development program.

Both the linked site plan approval and the PUD using non-contiguous open space provide Meridian Township with further opportunities for protecting valuable open space.

6. Implementation Plan

There is no single approach that can be used for overall conservation in the Township. Rather, a variety of implementation tools for protecting the physical network of the plan are chosen based on the ownership status of individual properties. The following matrix (Figure 6a) indicates the tools that must be engaged to implement the physical network for different situations of property ownership or the varying status of development existing on the land. While some generalizations have been made it should be noted that each situation is unique. Also, even with the right tools, the success of the project comes down to the finesse with which the plan is implemented on a site-by-site basis.

The primary tools that should be used in each situation are shown as the largest icons in the matrix. Supplemental tools are shown as smaller icons according to their importance. For example, to protect Priority Conservation Corridors on private residential land, the primary implementation tool to be used is voluntary stewardship. Conservation easements and land acquisition may also be used in critical cases.



Legend



6.1 Property Ownership

The ownership status of the land in question has large implications for the conservation approaches that are recommended and the overall success of the implementation plan. For each category of ownership, unique challenges and opportunities exist for innovative conservation approaches, long-term stewardship and restoration, and redevelopment. Each type will need a different approach for long-term conservation of the corridor. The ownership types include:

Vacant/Undeveloped

The vacant land category is land that currently has no structures on it. The land is privately owned or owned by development corporations and therefore has a high possibility of future development. Working with developers to identify the unique components worth preserving and protecting before development begins makes it easier and more likely that the developer can accommodate a conservation approach to development rather than attempting to restore or retrofit after a site plan is established.

Private Residential

The private residential category includes land that is currently in residential use. Larger rural residential parcels have a strong potential to be more densely developed in the future, in which case they face many of the same challenges and opportunities as the vacant land category. The larger parcels in the eastern portion of the Township are especially subject to this development pressure.

Some of the parcels, however, will not likely see future intensive development. Unlike the commercial category of ownership, the people who own these parcels have a direct incentive for protection and stewardship of their land. These parcels offer many opportunities for working with private landowners on public-private partnerships, voluntary stewardship programs, or conservation easements for the long-term protection of the property's resources.

Commercial

This category includes commercial, industrial, office, and utility properties. Conservation can be particularly challenging for this category for several reasons. First, these businesses are often not directly responsible for the long-term maintenance of their properties but rather contract out this responsibility. Large-scale maintenance firms contracted by businesses to do the landscaping and maintenance of a property often do not have the training or equipment to specially manage properties for native species or habitats. Educating these maintenance groups on the proper use of pesticides for properties along waterways can be especially important for protecting important riparian habitat.

Institutional

This category includes property of religious organizations, schools, and public lands. While the institutional ownership type can have some of the same challenges as businesses in terms of the lack of contact, often, there is a high potential for community involvement and educational opportunities. In many of these situations there is a built-in group for implementing voluntary stewardship measures such as a church group or students.

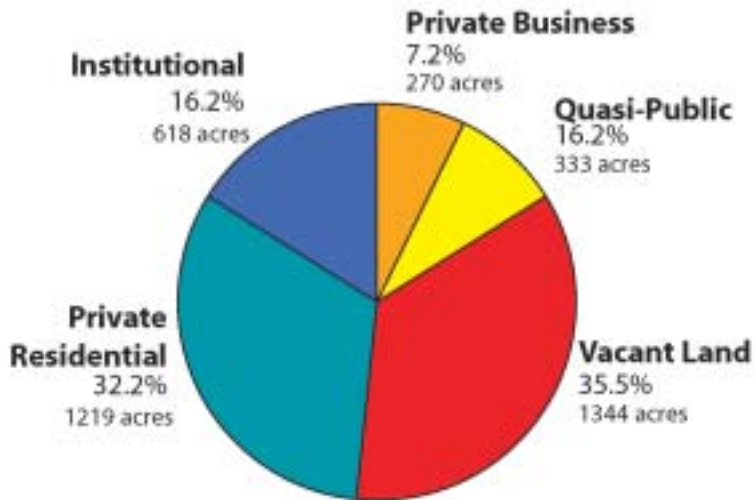
Quasi-Public

This category includes community and neighborhood open space. The management of these lands are overseen by a variety of condominium and neighborhood association boards. Some of these boards are very active and knowledgeable about their roles and responsibilities. Others may meet very infrequently and may have limited community participation.

There are two issues that may be encountered with these organizations. First, there may be legal restrictions on what they can do with the land. Second, there may be concerns regarding legal liability of the board regarding some decisions. When possible, the Township should offer technical assistance

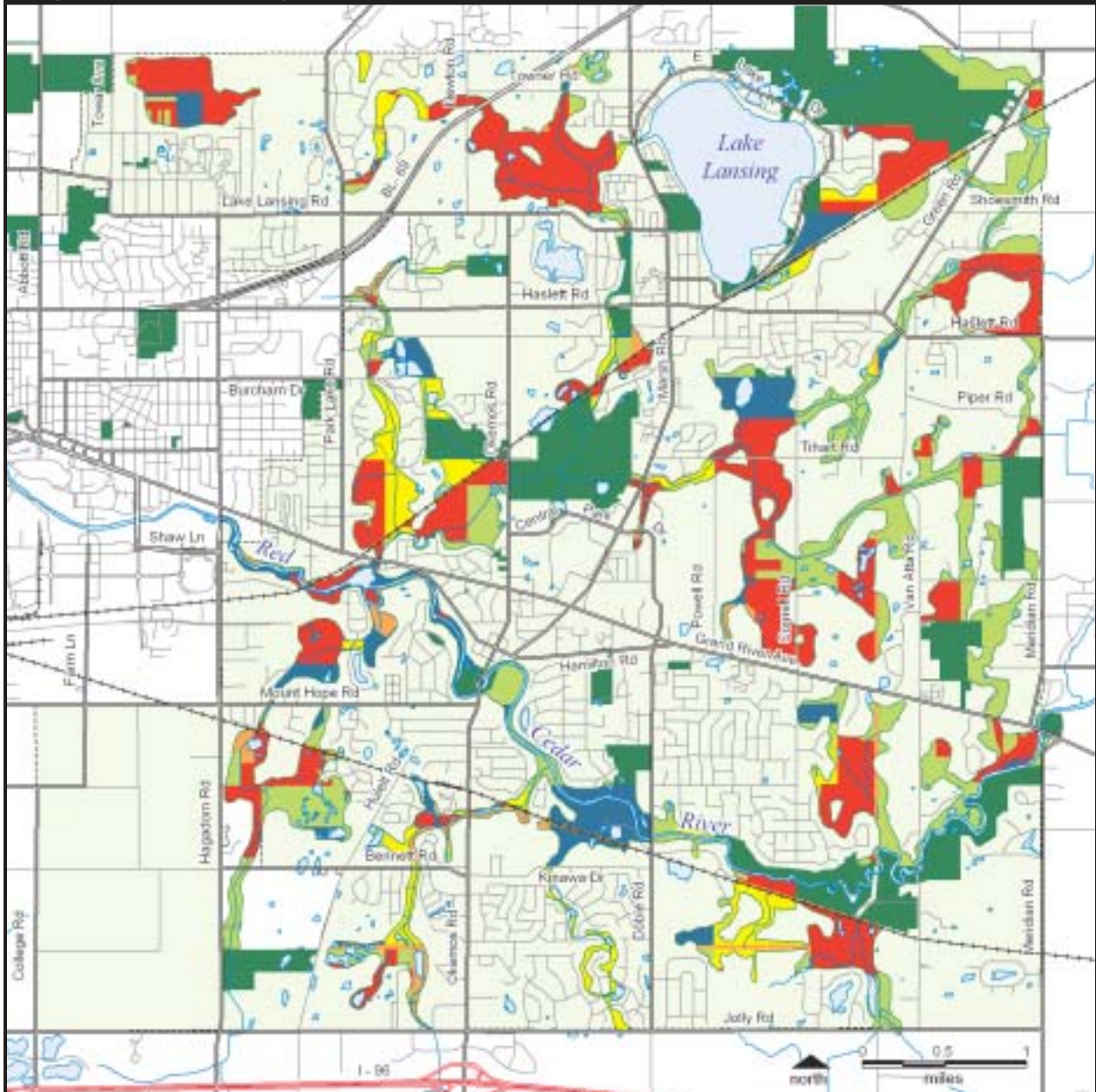
to these groups if they are working on an issue that benefits a Priority Conservation Corridor or Non-motorized Corridor.

Fig. 6b. PCC Distribution



The pie chart shows the percentage by ownership of the Priority Conservation Corridors. Private residential properties and vacant land are the two most prevalent categories. Both of these property ownership types are subject to heavy development pressure.

Fig. 6c. Priority Conservation Corridor Ownership Status



In this map, the Priority Conservation Corridors are separated into ownership types. Each type will need a different approach to long-term conservation of the corridor. The ownership type includes:

- **Vacant Land** - land that currently has no structures. Many of these parcels are owned by private companies and have a high possibility of development.
- **Private Residential** - land is currently in residential use.
- **Commercial**- commercial, industrial and utility property.
- **Institutional** - religious, school and public land.
- **Quasi-Public** - community and neighborhood open space.

6.2 Off-road Facilities Implementation

Figure 6d indicates the ownership status of properties that the off-road pathway system crosses. Just as the ownership status of the land in question has large implications for priority conservation corridors, it also will effect the implementation strategies pursued for the off-road pathway system as well.

Intergovernmental Cooperation

In several areas, off-road facilities are suggested across MSU property or County property. Several pathways beyond the Township border are also suggested as a means for linking destinations in East Lansing, surrounding townships or regional trails such as the proposed Red Cedar Greenway. These situations will require coordination with County planning entities, MSU, other Township governments, and the City of East Lansing. Cooperation with other municipalities and public institutions is key in creating a functional regional non-motorized system both regionally and within the Township.

New Development

Some facilities are proposed across properties owned by development corporations that have a high chance of developing in the future. Working with developers to identify appropriate connections of non-motorized systems before development begins makes it easier and more likely that the developer can accommodate public access to the development rather than attempting to restore or retrofit after a site plan is established.

If the new development has limited road access to surrounding arterial streets, special access points for pedestrians and bikes should be incorporated between property lines. Connectivity between adjacent residential, commercial and institutional developments should be enhanced. The Township can regulate the form and shape of new neighborhoods to support and promote pedestrian and bike mobility both by modifying subdivision ordinances and in the site plan review process. Residential site plans can encourage walking through careful design of the site, and by making travel by non-motorized modes of transportation more direct than travel by car.

Private Property

Facilities are suggested across private property including commercial property, industrial property, and residential property. Although these cases were minimized as much as possible, in a few instances, it is the only option for providing a critical link in the system. Trail easements should be pursued in cases of private property ownership. See Section 5.3 for further discussion of trail easements.

Quasi-public or Private Open Space

Some neighborhood or condominium associations are very willing to allow public access through their neighborhood open space. Other associations are very concerned about issues of privacy, or perceived crime, and heavy traffic through the neighborhood. Each association should be approached on a case-by-case basis and the terms of agreement custom-made to fit the wishes of the community.

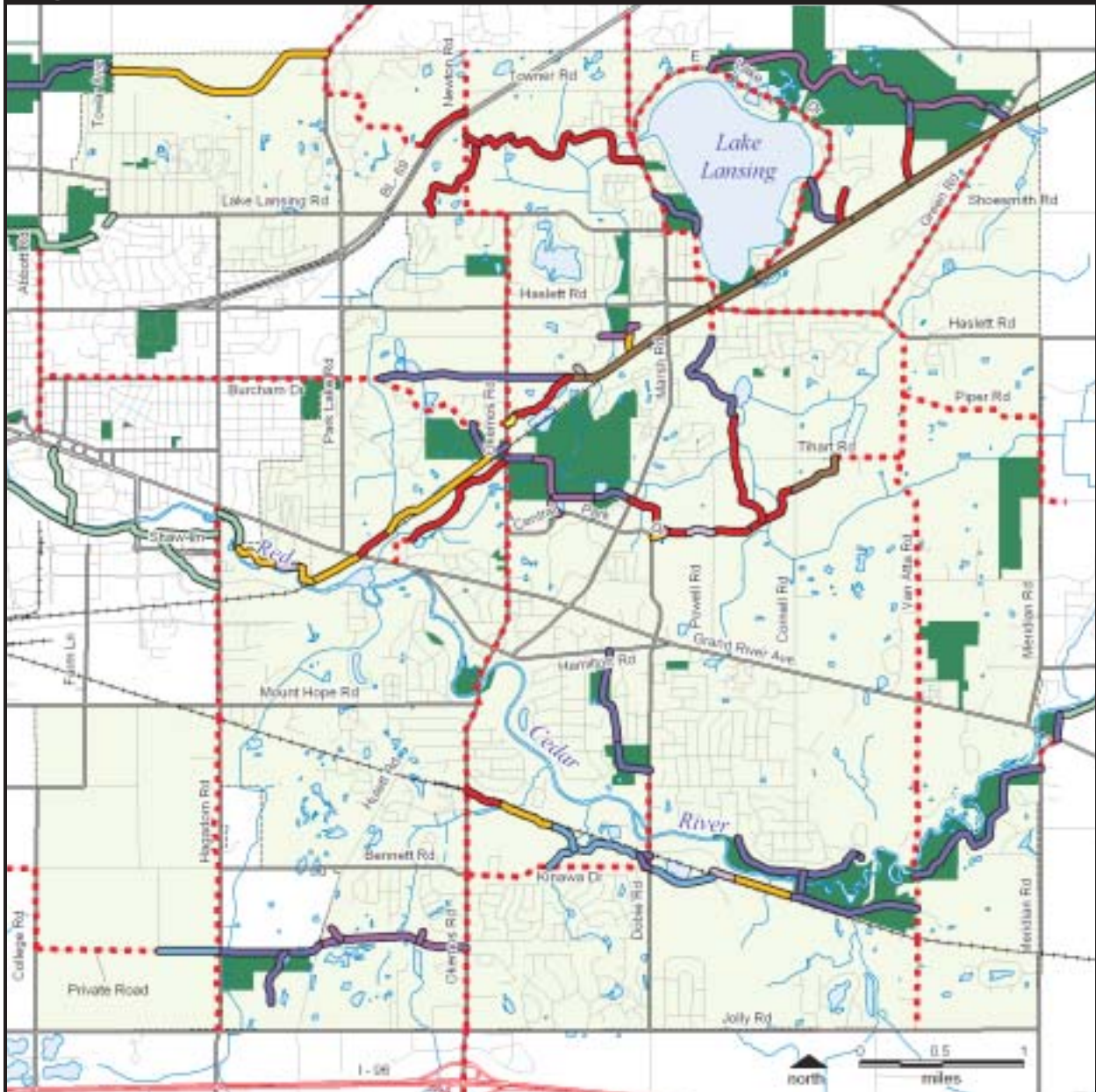
In the past, some utility companies have been willing to lease public access to municipalities. The Consumers Energy corridor in the southwest part of the Township currently has a lease for neighborhood access for part of the corridor.

Future Trail Options

Several options for off-road trails were discussed during the planning process that are not shown on the final plan that bear special consideration. The first is the creation of a trail along the Consumers Energy utility corridor in the eastern part of the township. While the idea of a trail along the corridor was supported by many people attending the public workshops, adjacent land owners strongly oppose the idea and therefore it is not incorporated into the plan at this time. Utilizing the corridor for a public trail would, however, provide scenic and strategic off-road links in the township trail system and the possibility should be considered in the future if the ownership of the properties in this area or landowner opinions change over time.

The second trail possibility that was discussed but not shown on public meeting maps was the idea of a rail-trail along the CSX railroad. Again, this would be a very valuable addition to the township off-road trail system, however, it is not feasible at this time. Should the rail corridor be abandoned in the future, it is recommended that the township vigorously pursue the option of acquiring the portion of the corridor in the township for a rail-trail as this is a very desirable link.

Fig. 6d. Off-road Non-motorized Corridors Ownership Status



Both existing and proposed facilities are shown.

■ ■ ■ ■ ■ On-road non-motorized facilities

— Existing off-road non-motorized facility

— Proposed facility across MSU property or County property

— Proposed facility beyond township border

— Proposed facility across new development (property currently owned by development corporations)

— Proposed facility across business, industrial or vacant property

— Proposed facility across residential property

— Proposed facility across public property including township park and school properties

— Proposed facility on private open space such as neighborhood common areas

— Proposed facility across public utility property

■ Parks and Open Space

7. Conclusion

The goal of the project is create a Greenspace Plan for Meridian Township that reflects the unique ecological, cultural, and recreational resources of the Township. The Greenspace plan outlines a network of greenspaces throughout the Township that will preserve the unique ecological diversity of the Township, protect and preserve water quality, provide the basis for a non-motorized transportation system and recommend policies for sustainable growth. The plan is the result of extensive public input as well as an in-depth inventory and analysis of the cultural, ecological, recreational, and non-motorized resources of Meridian Township and its immediate surroundings.

The plan brings together three key elements: a network of key ecological corridors, preservation of scenic roadways, and providing walking and bicycling links. It also looks at how lands may be redeveloped or enhanced to further the greenspace vision.

While the vision is simple, the plan recognizes that there is no single implementation solution that works for all situations. Thus, a variety of implementation tools are recommended. The variety of situations brought to bear by the combination of ownership types and states of development call for tailored suites of tools. The most important tool for areas yet to be developed is conservation zoning. It is a simple approach that clusters homes to permit the establishment of a network of greenspaces that flow seamlessly between developments.

It is an equitable plan that balances the needs of the community and the needs of private landowners. Developers may still develop the same number of houses as before. The open space developments have the added benefit of reducing developer's infrastructure investments and providing highly demanded amenities. For the community, the environmental and aesthetic benefits of preserving open space and scenic roadways are complemented by a network of bicycling and walking paths that highlight these amenities and help people lead active lifestyles.

8. Key Terms

The following is a list of definitions to key terms useful in understanding the Meridian Township Greenspace Plan.

Areas of Special Concern

Portions of the Priority Conservation Corridors that merit special attention. These include:

- **Remaining Agricultural Areas** - where property owners desire to keep their land actively farmed
- **Road Crossings** - where the Priority Conservation Corridors intersect with major roadways
- **Fragile Linkages** - where the Priority Conservation Corridor is exceptionally narrow or fragmented.
- **Restoration Link** - areas where no conservation corridor currently exists but there is potential to establish a corridor with the redevelopment of a few key parcels.

Bike Lane

A portion of the roadway designated for bicycle use. Pavement striping and markings along with signage are used to delineate the lane.

Bike Route

A designation that can be applied to different types of bicycle facilities including shared roadways, shared-use paths, and bike lanes. It is intended as a navigational aid to help bicyclists find their way to a destination where the route is not clear or there is an alternative route ideal for cyclists that is not obvious.

Conservation easement

A legal agreement a property owner makes to restrict the type and amount of development that may take place on his or her property. A property owner voluntarily enters into an agreement with a public agency or non-profit organization that will hold the easement. The landowner retains the title of the property and the right to sell it, but future buyers are restricted to the conditions of the easement. The easement specifies the rights the landowner retains and the restrictions on use of the property.

Conservation zoning

An overlay zoning feature in addition to existing zoning that mandates the protection and preservation of a portion of the buildable land of the parcel or parcels being developed for residential housing. 30% of each parcel or parcels is the recommended portion for Meridian Township. This 30% is in addition to the areas already protected by natural feature overlay zoning.

Foot Trail

An unpaved pathway for the exclusive use of pedestrians. These are often indicated through environmentally sensitive areas.

Greenspace

Natural features including forested areas, shrubby and grassy areas, wetlands, ravines, parks and common areas, golf courses, cemeteries, streams and river corridors, recreational pathways and agricultural areas. A greenspace system is an interconnected network of greenspaces.

Linked site plan approvals

Linked site plan approvals would allow the Township to permit two or more non-contiguous sites to be considered as one development plan.

Non-motorized facility

A facility designed primarily for the use of pedestrians, bicyclists, or equestrians. It may be designed primarily for one user-type or designed for shared uses. These facilities include trails, pathways, sidewalks, bike lanes, shared-use paths and paved shoulders.

Planned Unit Development (PUD)

A process by which land is developed to include individual building sites and common property, such as a park, and which is designed and developed under one owner or organized group as a separate neighborhood or community unit.

Priority Conservation Corridors

A network of ecologically significant open spaces. They include land that is important for wildlife habitat, drinking water protection, recreation, flood protection, ground water recharge, and other watershed functions

Purchase of Development Rights (PDR)

Voluntary, legal agreements that allow owners of land to sell the right to develop their property to a township, city, county, or state government, or to a nonprofit organization. A conservation easement is placed on the land and the agreement is recorded on the title as to be enforceable in perpetuity.

Scenic road corridors

Special routes in Meridian Township that are canopied, tree-lined, or afford beautiful views of the farmland and rural landscapes in the Township. Development is required to be set back 150 ft. from the road to preserve views and trees lining roadway.

Shared-use path

A wide pathway that is separated from the roadway by an open unpaved space or barrier. A Shared-use path is shared by bicyclists and pedestrians.

Sidewalk

A paved walkway separated from the road for use by pedestrians. Bicycle use may also be permitted.

Trail easement

A trail easement is a conservation easement agreement between a landowner and a trail organization or local or state agency that is legally enforceable and by which the owner of the land agrees to allow public access for trail use. The trail corridor remains the property of the owner and can be sold.