St. Clair County
Trails and Routes Master Plan

St. Clair County
Parks and Recreation
Commission

Prepared by:

The Greenway Collaborative, Inc.

With Financial Support From:
community foundation
FOR SOUTHEAST MICHIGAN

June 5, 2009

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Index

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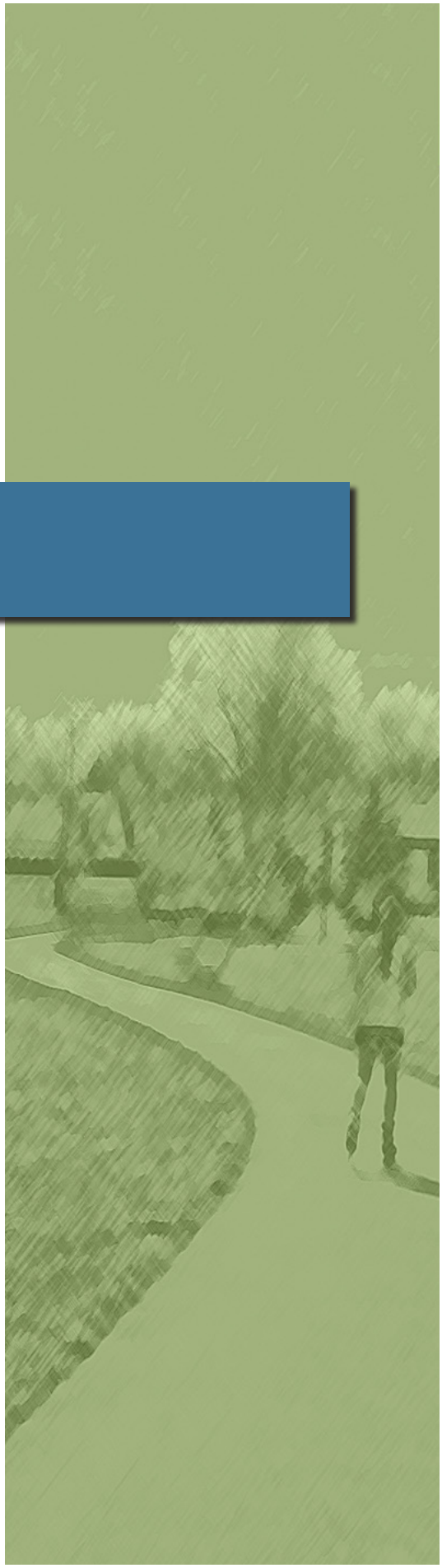
Section 1
Introduction and Overview



Purpose of the Trails and Routes Action Plan

Plan Context

Trail and Route Overview

Purpose of the Trails and Routes Master Plan

The St. Clair County Trails Action Plan is a conflation of what were previously two separate planning studies:

- Wadhams to Avoca / Bridge to Bay Link Master Plan
- South County Connector Feasibility Study

These two studies were initiated to address the two largest questions regarding trails in St. Clair County. First, how may the Wadhams to Avoca Trail be extended east through Port Huron to link up with the Bridge to Bay Trail? Second, what is the most appropriate route to link the Macomb Orchard Trail that ends in Richmond to the Bridge to Bay Trail along the St. Clair River?

As these two studies where nearing completion it became clear that they shared many elements and indeed that some of the proposed trails and routes linked the two initiatives. Thus, these two efforts, along with some related projects, were brought together into a single document to coordinate their implementation.

The purpose of the St. Clair Trails Master Plan then is to outline the next ten to fifteen years of major trail and bike route improvements. These improvements will be led by St. Clair County Parks and Recreation Commission in collaboration with local agencies. The report is not a comprehensive trails plan for the County. Numerous trails and greenways identified in other recent planning efforts will be undertaken by other agencies. This document focuses on the corridors of regional and county-wide significance.

This report also has an interactive web-based map component. All of the existing and proposed trails and routes may be viewed in Google Maps or Google Earth. Using these tools users may view the geographic information system (GIS) databases that were developed for the project that provide more detail on the proposals as well as view the trails and routes against a detailed air photographs.

Plan Context

St. Clair County Master Plan 2002-2006

The Action Program in the St. Clair County Master Recreation Plan 2002 – 2006 guided the two planning efforts that were combined in this report. Specifically, The South County Connector Feasibility Study, was designed to address the Acquisition Goals of "Purchase a property or properties in the south central portion of the County for the eventual development of a large regional park" and "Pursue possible linkages between existing properties and trails, including: St. Clair County to Macomb Orchard Trail in Richmond and Bridge to Bay Trail to future South Central County Park" (See page 81 of the St. Clair County Master Recreation Plan 2002 – 2006).

The South County Connector project evaluated three potential park sites and how those sites could be incorporated into a trail or route connecting the Macomb Orchard Trail to the Bridge to Bay Trail. It was decided to pursue the property that has now become Columbus County Park. While the purchase of the park property was being negotiated the South County Connector Feasibility Study was put on hold. Once the property was secured the final trails and route planning was completed.

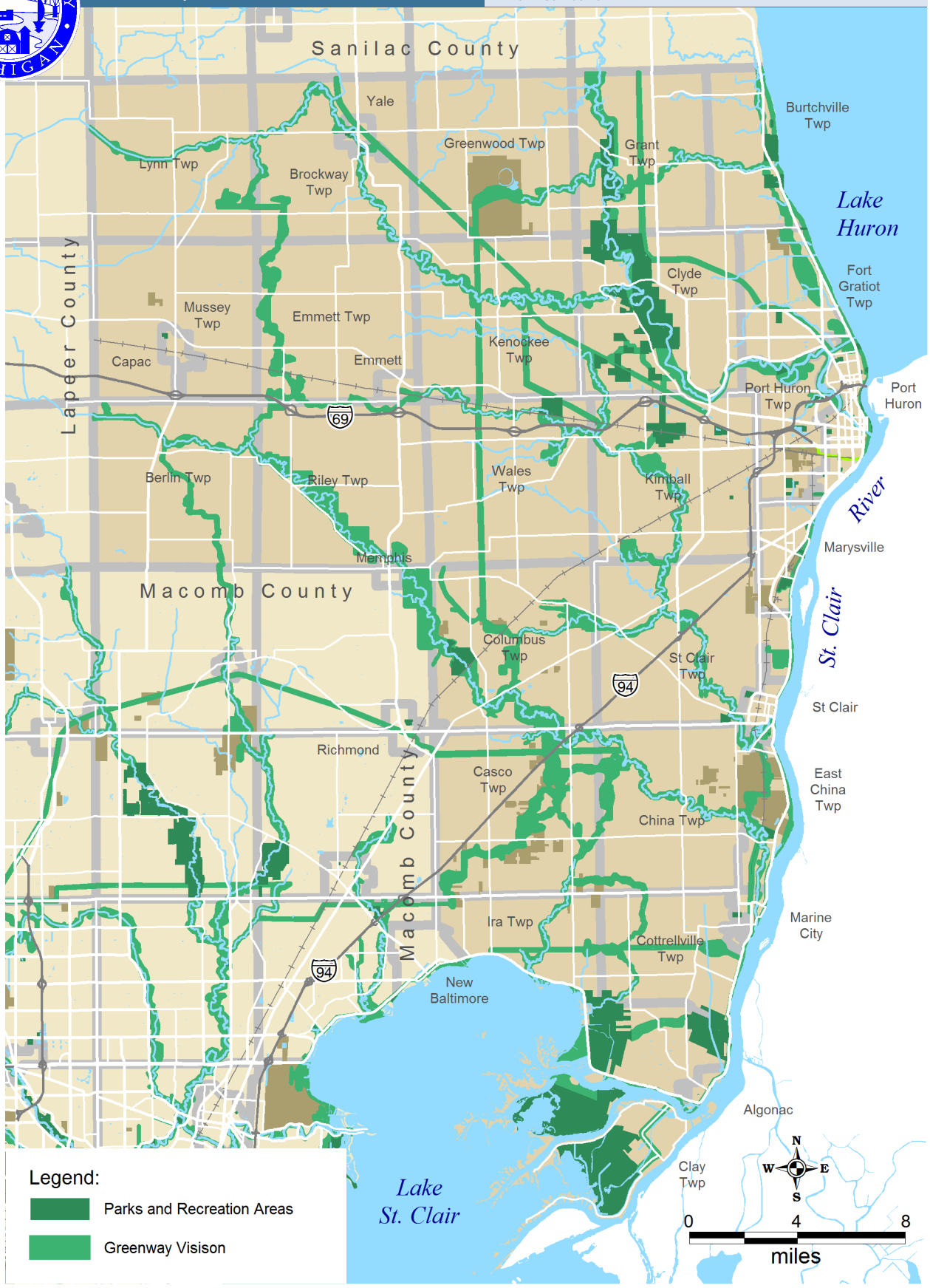
The Wadhams to Avoca / Bridge to Bay Link Master Plan was initiated in response to the Acquisition Goal of "Pursue possible linkages between existing properties and trails, including: Bridge to Bay Trail to Wadhams to Avoca Trail." This project was funded in part by The Community Foundation for Southeast Michigan's GreenWays Initiative. This project was expanded to include addressing one of the Wadhams to Avoca Trail Goals "Work with Michigan Department of Transportation (MDOT) and the St. Clair County Road Commission to provide a safe Wadhams Road crossing" and a goal to develop a trailhead in the Wadhams Road area.

Southeast Michigan Greenways

Southeast Michigan Greenway's Regional Vision identified a network of greenways in St. Clair County based on an extensive public input effort. The greenway corridors that are shown are based on natural features as well as community plans. Not all of the corridors shown were expected to include trails; some were intended primarily for wildlife habitat or the protection of water quality.

The Southeast Michigan Greenways project did not identify any link between the Wadhams to Avoca Trail and the Bridge to Bay Trail. The lack of an obvious link between these two trails was one of the key reasons the Wadhams to Avoca / Bridge to Bay link Master Plan was initiated.

In the south part of the county, the greenway corridors shown in the Regional Vision between the Macomb Orchard Trail and the Bridge to Bay Trail were a combination of an abandoned railroad corridor and a river corridor. The South County Connector study was to investigate the feasibility of those routes and determine the most appropriate route to link the two existing trails.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Legend:
Parks and Recreation Areas
Greenway Visison

Greenways Initiative Regional Trails and Greenways Vision

The Community Foundation of Southeast Michigan's GreenWays Initiative program held a series of workshops in 2006 to identify a network of greenways comprised of off-road trails and on-road connectors. The greenways were classified as Regional, County or Local trails and routes. The visioning workshops incorporated the preliminary ideas from the Wadhams to Avoca Trail / Bridge to Bay Link Master Plan as well as the South County Connector Feasibility Study. The Trails and Routes Action Plan generally reflects the trails classified as "Regional" and "County" in the GreenWays Vision. Not all of the county trails are included though as the Trails and Routes Action Plan focuses on the links to be undertaken in the next 10 to 15 years.

St. Clair County Nonmotorized Guidelines

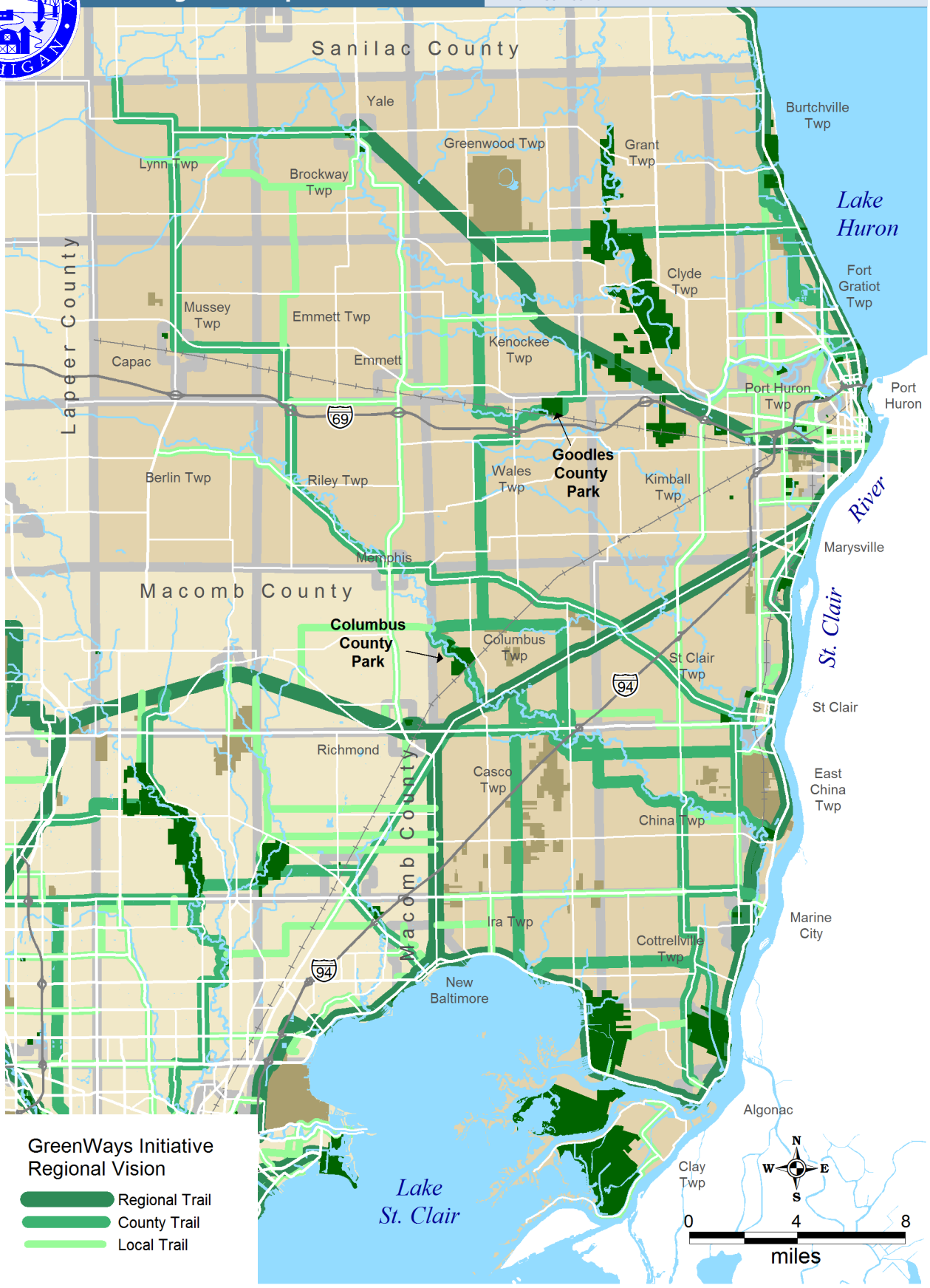
The St. Clair County Nonmotorized Guidelines were prepared for Michigan Department of Transportation's Port Huron Transportation Service Center. The purpose is to help all transportation agencies identify the most appropriate non-motorized facilities based on a project's context. The guidelines also include recommendations on how to handle many typical situations including trail and road intersections as well as trails through freeway interchanges.

The Nonmotorized Guidelines identify a probable future context drawn largely from the county's master plan. The future context influenced the type of trail proposed as well as the intensity of the improvements such as staging areas and interpretive stations. The proposed road crossing details are consistent with the St. Clair County Nonmotorized Guidelines.

The Airline Trail

The Airline Trail crosses the southern part of the state stretching from Lake Michigan to Lake Huron. The Bridge to Bay Trail and the Wadhams to Avoca Trail are part of that concept. The importance of the South County Connector Feasibility study can be seen when it is understood that it is one of the critical gaps in the Airline Trail.

Graphic from Connecting Michigan: A Statewide Trails Vision and Action Plan prepared by The Michigan Trails and Greenways Alliance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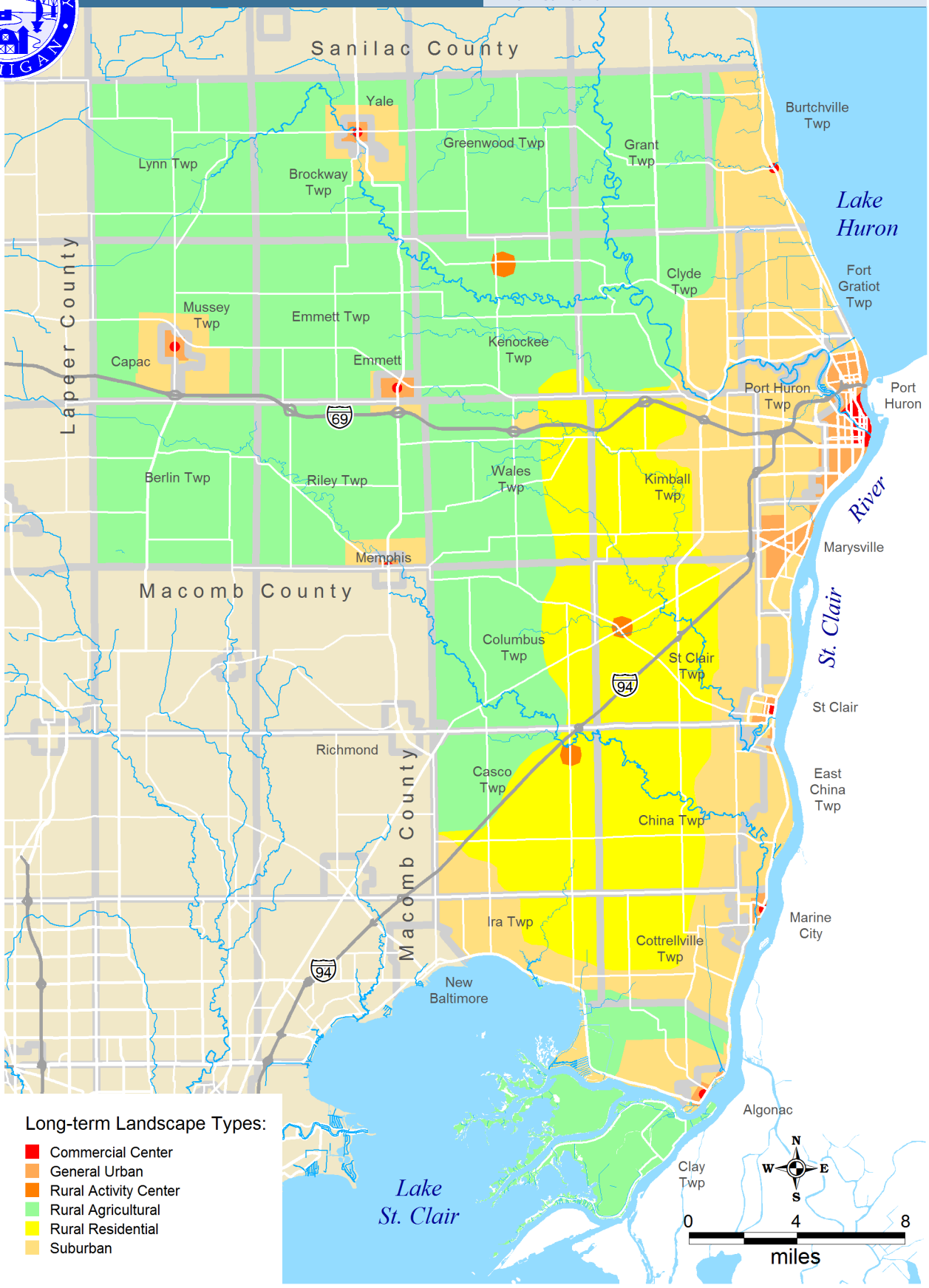
GreenWays Initiative
Regional Vision
Regional Trail
County Trail
Local Trail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miles
Long-term Landscape Types:
Commercial Center
General Urban
Rural Activity Center
Rural Agricultural
Rural Residential
Suburban

Trail and Route Overview

Trail and Route Definitions

The Action Plan classifies all of the existing and proposed corridors as either a trail or a route.

Trails are non-motorized facilities that for the most part, are independent from roadways. There are two distinct types of trails in the action plan:

- **Shared-Use Trail** – comprised of a single surface a minimum of 10' wide that is shared by bicyclists and pedestrians as well as a variety of other non-motorized users. The surface may be composed of concrete, asphalt, recycled asphalt fines, crushed aggregate fines or stabilized fines.

- **Separate-Use Trail** – the trail is comprised of two separate but adjacent trails, one for bicyclists and one for pedestrians. These trails are used in more urban areas where the number of users increases the potential for conflicts between user groups.

Routes are signed bike routes that utilize existing roadways. They are more of a wayfinding aid than a facility. Signed Bike Routes are used to guide bicyclists along suitable routes between two destinations. A key aspect of bike route signs is that they list the destination. Ideally, they also list the distance to the destination.

A Separate-Use Trail in Madison, Wisconsin

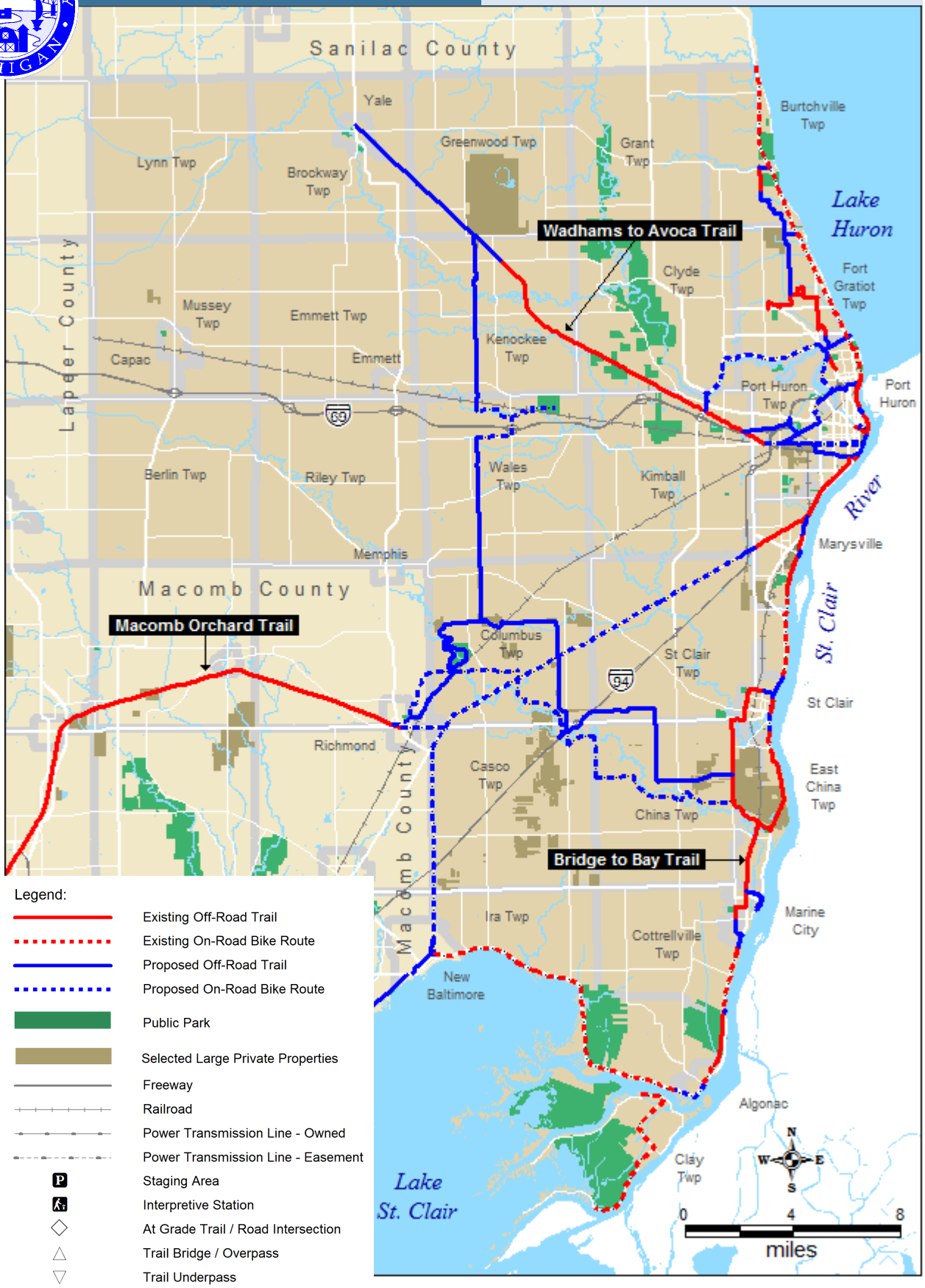
A bike route can take a number of forms. In determining if a facility is suitable for a bike route, issues such as traffic volume, speed, surface, etc. need to be considered. On low volume and/or low speed roads generally no specific improvements for bicycles are necessary. On higher volume and/or speed roads it may be necessary to have a paved shoulder or designated bike lane in order to be a suitable route. There are two distinct types of routes in the action plan:

- **Signed Bike Route** – these are on paved roadways and may be easily negotiated with most types of bicycles.

- **Signed Back Roads Bike Route** – these are on gravel roadways and are best traveled with a mountain or hybrid bicycle.

In some cases the route is chosen because it is the most direct route. In others, especially with Back Roads Bike Routes, the route may be a more circuitous, following scenic roads, linking points of interest and avoiding busier alternatives. Bike routes may be complemented by a map that shows all of the routes and the key destinations. Also, some long-distance bike routes, like the Bridge to Bay Trail, may be designated by a route number, much like highways are. More information on trail and route types can be found in the guidelines section of this report.

Trails and Routes Overview Map



The two primary trails in St. Clair County are the Bridge to Bay Trail and the Wadhams to Avoca Trail. Both Trails have outgrown their original named endpoints and have proven to be wildly popular with residents and visitors alike. The implementation of the two trails followed very different paths. The Wadhams to Avoca Trail is located on property owned by the County and the County constructed and manages the trail as a County Park. The Bridge to Bay Trail on the other hand, is located on a combination of public road ROW's, public property and easements on privately held land. It was built and is maintained by the different communities that the trail travels through.

The Bridge to Bay Trail in Port Huron. The Lightship Huron Museum can be seen in the background.

The County's role in the Bridge to Bay Trail has been one primarily focused on coordination, technical assistance, branding and marketing through its website and maps. Currently the County is investigating installing a unified family of signs for the Bridge to Bay Trail but for the most part, local agencies are wholly responsible for the planning and construction of the trail.

The third significant trail, the Macomb Orchard Trail, ends just west of the County line in Richmond. It is part of the Airline Cross State Trail. The Macomb Orchard Trail also links to many of the region's most significant off-road trails including the Clinton River Trail, The Paint Creek Trail and indirectly to The West Bloomfield Trail and the Polly Ann Trail.

These three regionally significant trails: the Macomb Orchard Trail, the Wadhams to Avoca Trail and the Bridge to Trail form the foundation for the trails action plan. The proposed trails and routes link these three trails into a system to and make them more accessible to a wider spectrum of the county's population.

Linking the Existing Trails with Flexibility in Mind

The focus of the Trails and Routes Action Plan are the Wadhams to Avoca Trail / Bridge to Bay Trail Link and the Macomb Orchard Trail / Bridge to Bay Link. For each of these two links, multiple connections are shown. There are three reasons for this redundancy. First, the gap may be bridged immediately with a bike route while the long-term goal of an off-road trail is implemented. Second, some routes require easements or the purchase of property, if land cannot be secured, alternative routes are provided. Third, some routes are dependent on the completion of a major project which may or may not be completed as currently envisioned.

The intent then was to provide an Action Plan that has the necessary flexibility to respond to potential challenges and opportunities.

Completing the Wadhams to Avoca Trail

The action plan also includes some recommendations for completing the Wadhams to Avoca Trail. The scope of the original Wadhams to Avoca / Bridge to Bay Link study was expanded to include how to address the Wadhams Road crossing and a new staging area.

Bridge to Bay Trail Gaps

The Bridge to Bay Trail was outside of the scope of this document, therefore only general recommendations are provided regarding completing this trail. This is not in any way a reflection of the importance of closing the remaining gaps in the Bridge to Bay Trail, rather it reflects the fact that this trail is being planned and implemented by local agencies.

Secondary Trails and Routes

In addition to the gaps mentioned above, a number of secondary opportunities are identified. While these links are perhaps not the same priority as the gaps between the major trails, opportunities may arise along these corridors that should be sized if the opportunity presents itself.

Trail Names and Logos

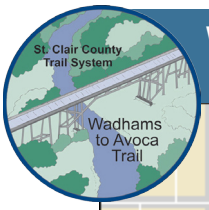
The proposed trails and routes have all been given names to simplify identification. The names should be considered “working names” and not necessarily the final name to be used when the trail or route is completed. Also, a draft logo was developed for the “Rails to River Trail” to illustrate how a logo could be integrated into the various proposed signs for the project. The logo should likewise be considered a conceptual idea for consideration rather than a finished product.

Section 2
Wadhams to Avoca Trail

Wadhams Road Crossing

General Crossing Improvements

Interpretive Signage



Wadhams to Avoca Trail

Legend:

- Existing Off-Road Trail
- Existing On-Road Bike Route
- Proposed Off-Road Trail
- Proposed On-Road Bike Route
- Public Park
- Selected Large Private Properties
- Freeway
- Railroad

Wadhams to Avoca Trail

The 12 mile long Wadhams to Avoca Trail is St. Clair County Parks and Recreation Commission's premier trail. The original trail endpoints have been expanded as the trail now extends from Avoca east through Wadhams to Lapeer Road just west of the I-94 overpass at the outskirts of Port Huron.

Wadhams Road Gap

There remains though a gap immediately west of Wadhams Road. The reason for the gap is that the crossing of Wadhams road is unusually challenging due to a combination high traffic speeds, heavy truck traffic and sight line issues. There is also a lack of any near-by safe crossing alternatives. The Appendix includes a document that discusses the issues in more detail and a range of alternatives that were evaluated.

At this time, the most likely solution appears to be a Hybrid Pedestrian as shown on page 92, located at or very near the original railroad crossing. There are though three alternatives:

- **Alternative 1**- Wadhams Road Underpass. This alternative has a number of construction issues including a high water table that must be addressed and is a significant construction project in terms of cost and traffic interruption. Concerns with this alternative include trail user's perceived and actual personal safety in the underpass.

- **Alternative 2-** An unsignalized At-Grade Crossing, is a much smaller construction project than alternative 1 although it does require reconfiguring the lanes on Wadhams Road. It also requires some property acquisition and/or easements for trail re-routing although a land-swap may be possible.

- **Alternative 3**- Signalized Crossing at the Freeway Interchange, requires a substantial amount of property acquisition and/or easements for the trail alignment but the crossing itself is quite simple and inexpensive.

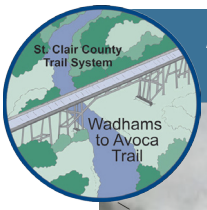
The Alternatives are illustrated and discussed on the following pages.

General Crossing Improvements

In addition to the Wadhams Road Crossing, a number of the other road crossing should be upgraded to improve the alignment of the trail at the road crossing and add appropriate signage and pavement markings as indicated in the Design Guidelines section. The Lapeer Road Crossing and Staging Area Concept Plan illustrates how a typical approach.

Interpretive Signage

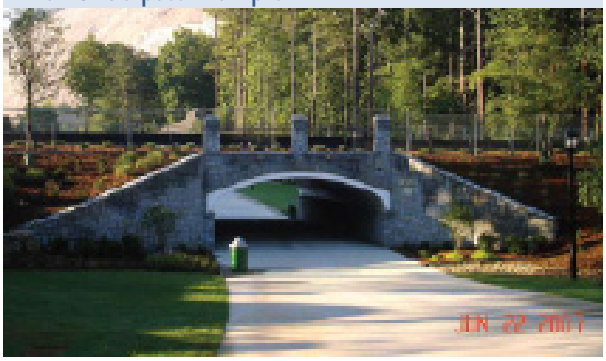
To enrich the users experience on the trail a coordinated interpretive signage system could be used to explore a particular theme on the trail. The theme could be integrated with the transportation theme proposed for the Rails to River Trail or, something different.



Alt. 1- Wadhams Road Underpass

Wadhams to Avoca Trail

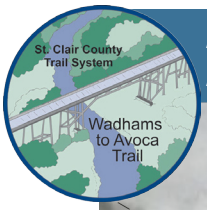
Trail Underpass Example



The photo above illustrates an 80’ long, 24’ wide, and 10’ tall tunnel with decorative treatment on the wing walls.

Key Recommendations:

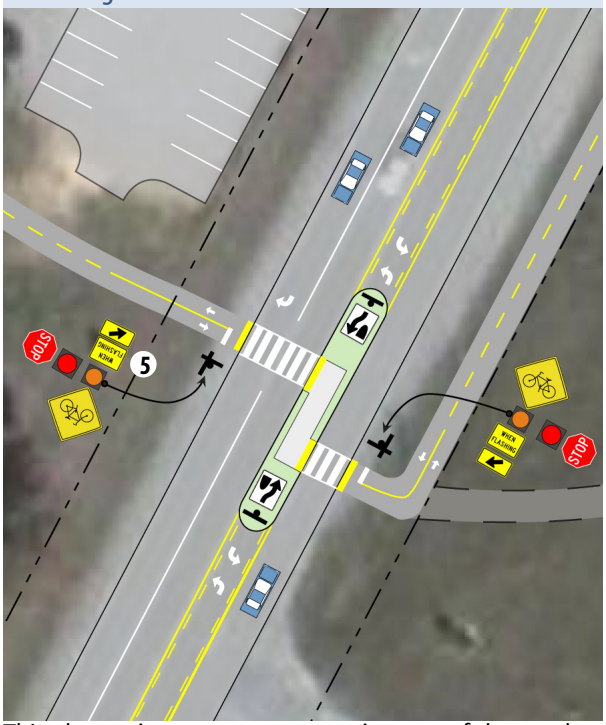
1. 5% ramp down to underpass.
2. To accommodate the side slopes of the ramp leading to the underpass, an approximately 100’ wide strip of land would need to be secured through easements and/or purchase.
3. An 80’ long retaining wall to prevent seepage of groundwater into tunnel.
4. A 100’ long, 16’ wide and 12’ tall tunnel.
5. Connect the existing sidewalk to the trail.
6. Construct a planted berm to encourage trail users to follow the path alignment.
7. Provide a trailhead with a single loaded parking lot, a bio-swale to capture storm water, a prefabricated concrete single-vault toilet facility, a trail head information kiosk and picnic tables.



Alt. 2 - An Unsignalized At-Grade Crossing

Wadhams to Avoca Trail

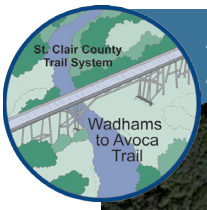
Crossing Island Detail



This alternative proposes converting one of the north-bound lanes to a designated shared left-turn lane in order to accommodate the large number of vehicles turning into the truck stop as well as provide a place for the crossing island.

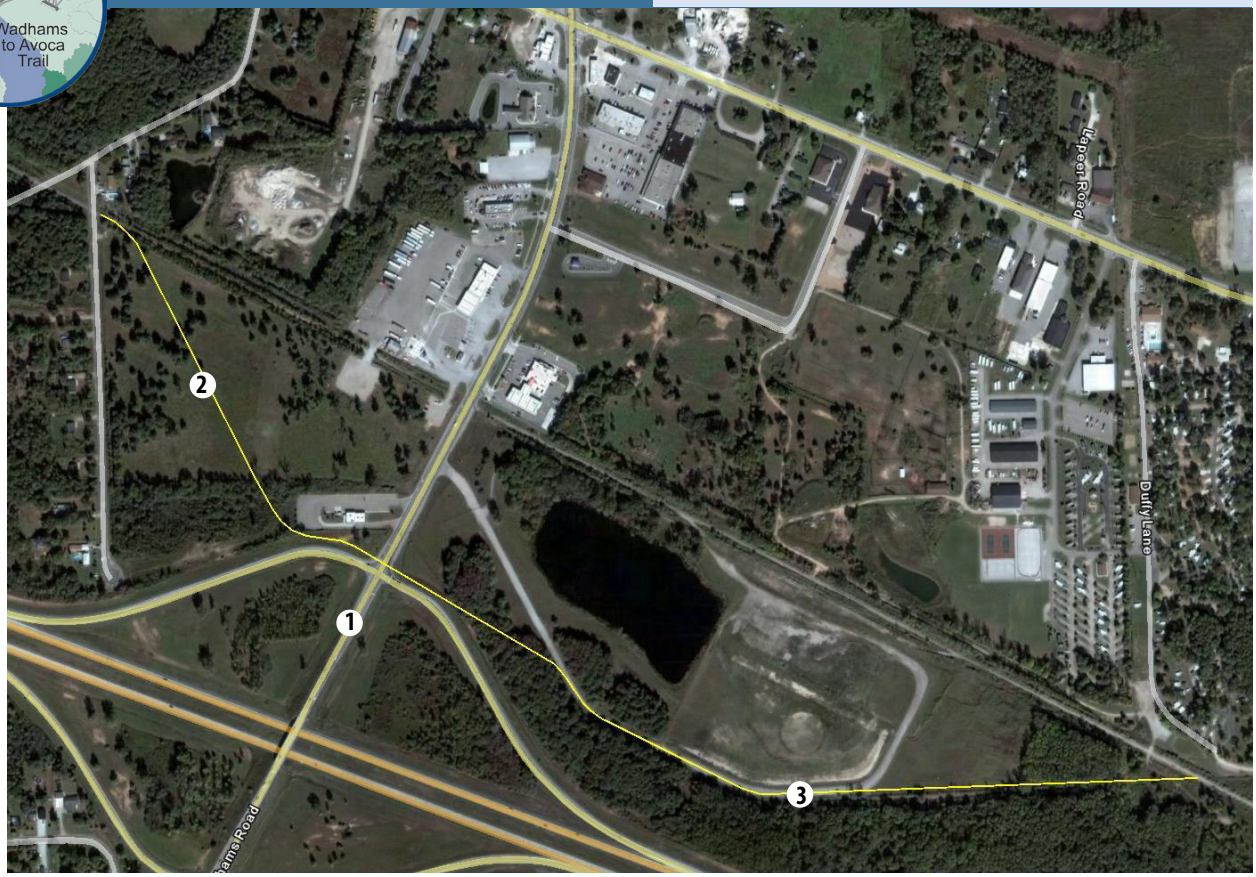
Key Recommendations:

1. Create an unsignalized mid-block crossing with a zig-zag crossing island sufficiently south of the truck stop to allow room for trucks to stack in a center turn only lane.
2. From the northwest, redirect the trail users via a berm around the trailhead parking lot to the crosswalk.
3. From the southwest, trail parallels road within public right of way to crosswalk.
4. The preferred alignment from the southwest would gradually redirect trail users to the crossing island.
5. Provide a passively activated flashing beacon at the crosswalk and the advance warning signs. See page 86 of the Design Guidelines section for more information on the flashing beacon.



Alt. 3- Signalized Crossing at the Freeway Interchange

Wadhams to Avoca Trail



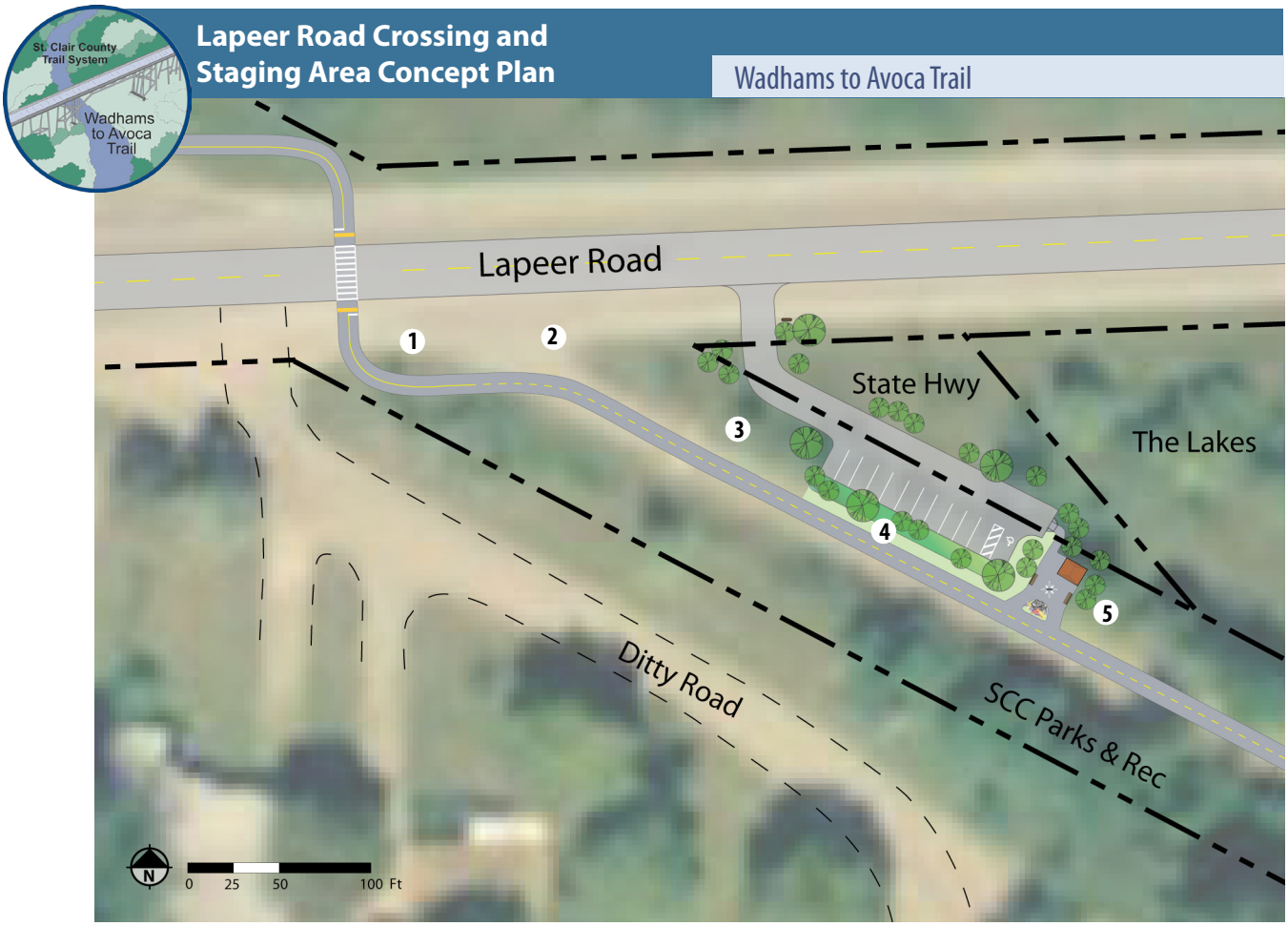
Crossing Location

The photograph above looks south on Wadhams Road to the freeway overpass. The crosswalk in the alternative would be located at the exiting signal.

Key Recommendations:

1. Incorporate a pedestrian signal and crosswalk into the existing signal at the freeway entrance and exit ramps.
2. Reroute the trail some distance to the east and the west of the existing crossing to discourage crossing where the trail currently meets the road. This will require obtaining easements or purchasing land from the existing lane owners.

This alternative requires obtaining permission from Federal Highway Administration (FHWA) to locate the trail in the part of the freeway right-of-way. At this time they are unwilling to permit this.



Key Recommendations:

1. Realign path to cross Lapeer Road at right angles.
2. Place a landscaped berm to reinforce trail realignment.
3. Provide a 12 car parking lot. The parking lot extends into a small parcel of land that was once owned by the MDOT but has since been deeded over to the St. Clair County Road Commission.
4. Surface runoff from parking lot is collected into vegetated bio-swales where storm water is absorbed into the ground.
5. A prefabricated concrete single-vault toilet building.

Section 3
Wadhams to Avoca Trail/ Bridge to Bay Trail Connectors

Rails to River Trail

Gateway Bike Route

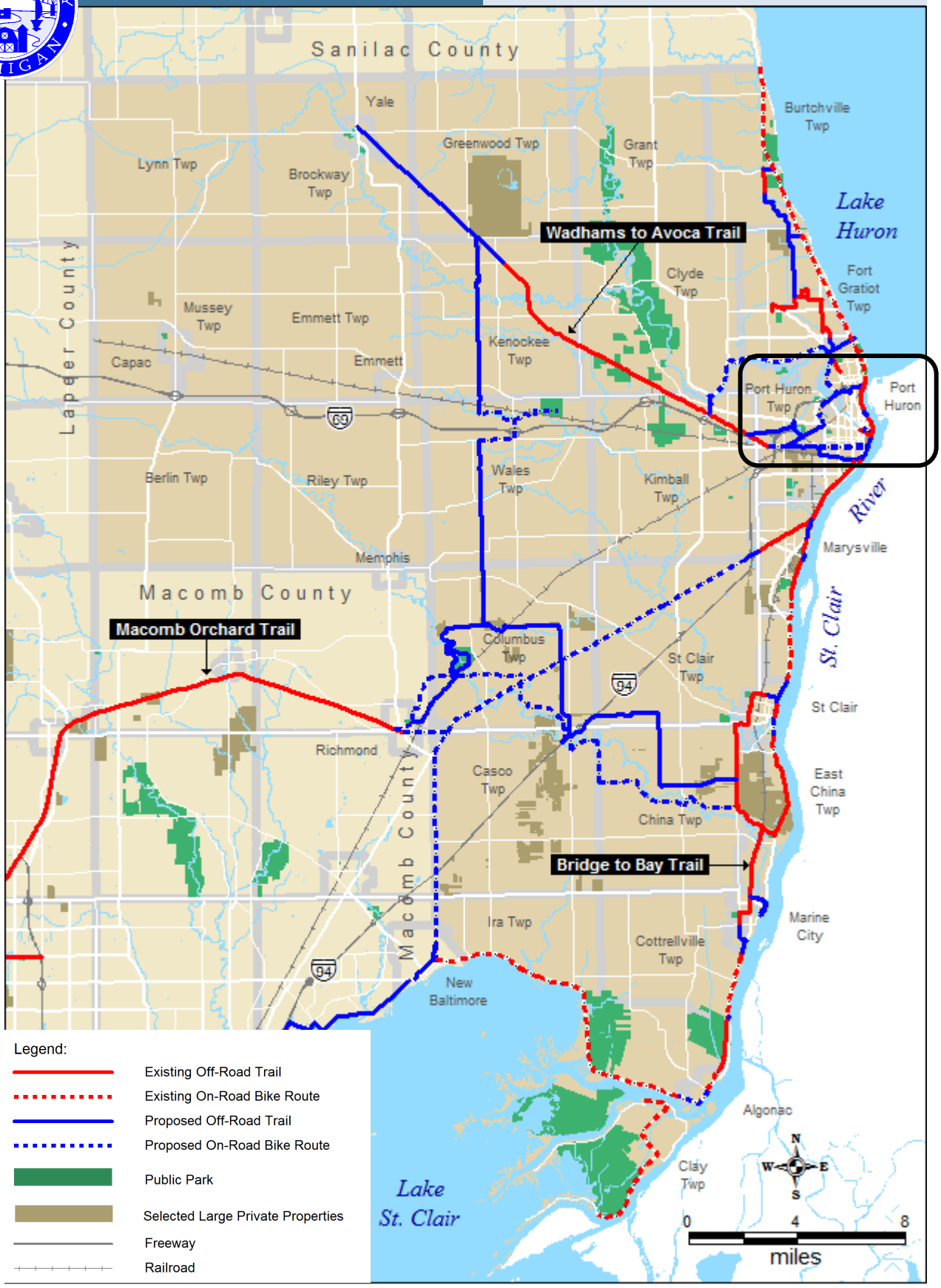
Two Bridges Trail

CN Spur Trail/ Trail Connector Bike Route

Township Connector Trail

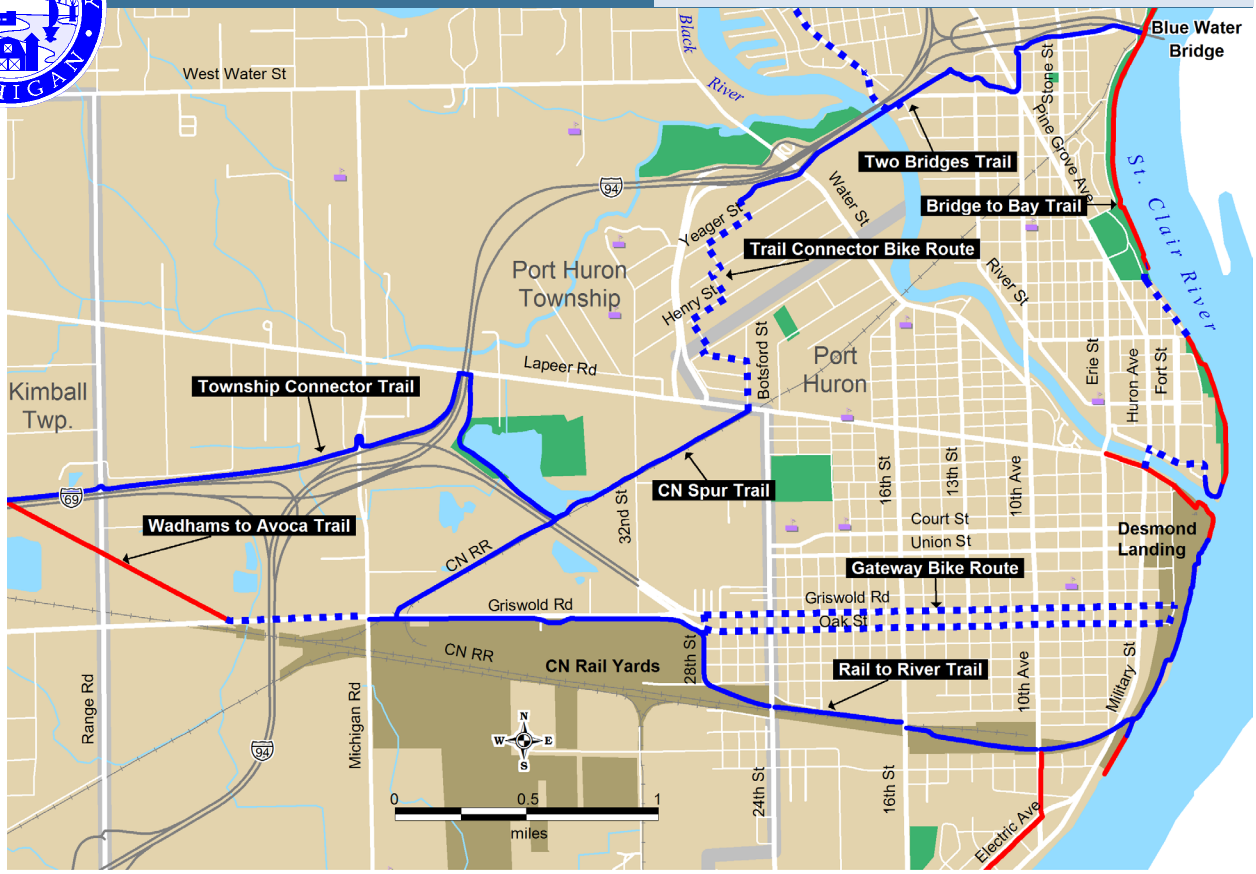
Connector Trails and Routes Context

WTA to BTB Trail Connectors



Connector Trails and Routes Overview

WTA to BTB Trail Connectors



Legend:

- Existing Off-Road Trail
- Existing On-Road Bike Route
- Proposed Off-Road Trail
- Proposed On-Road Bike Route
- Public Park
- Selected Large Private Properties
- Freeway
- Railroad

Proposed Off-Road Trails:

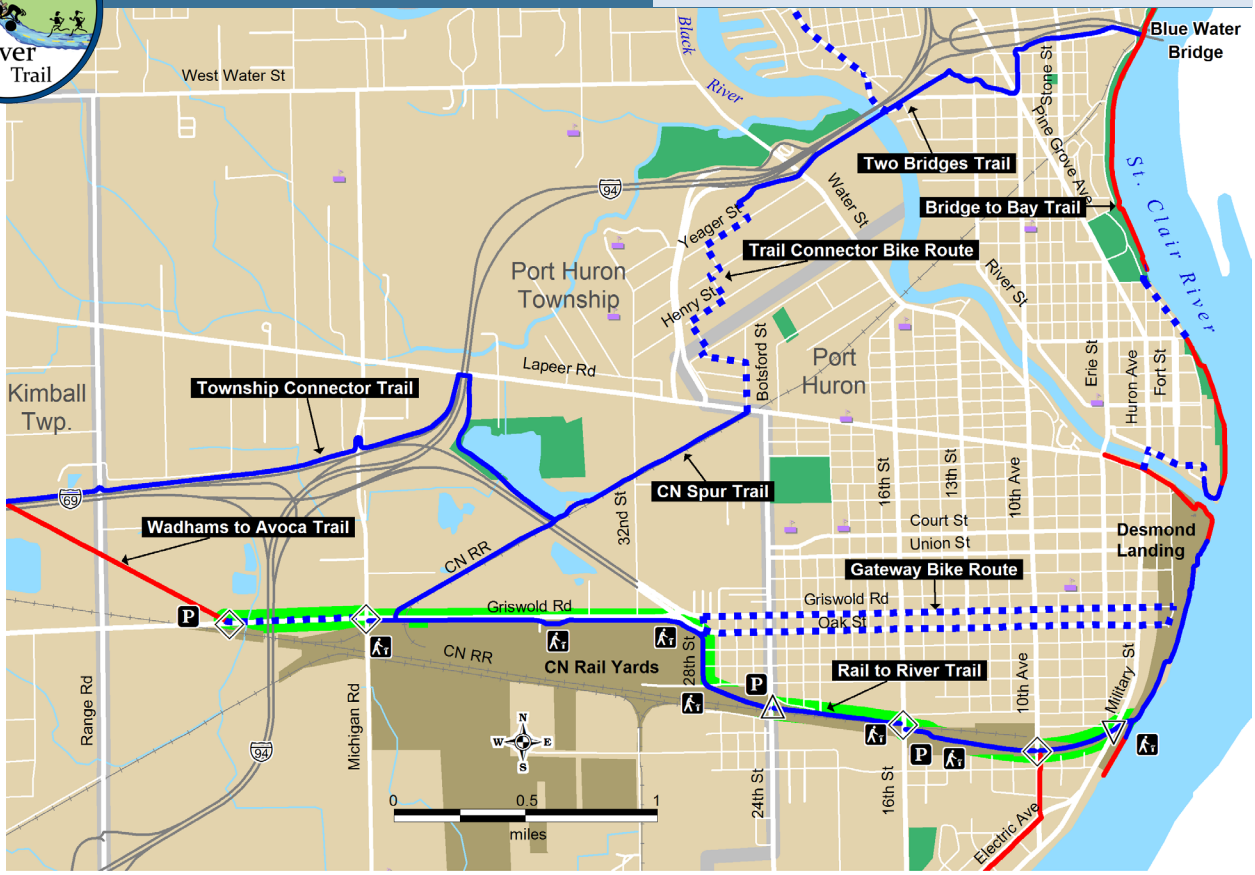
- **Rail to River Trail** - this is proposed to be the primary link between the Wadhams to Avoca Trail and Bridge to Bay Trail.
- **Two Bridges Trail** – this trail is dependent on the proposed Black River Bridge project and the proposed Toll Plaza project.
- **CN Spur Trail** – this secondary route would lead from the Rail to River trail toward the Two Bridges Trail.

Proposed On-Road Bike Routes:

- **Gateway Bike Route** – is a Complete Street make over for the business route leading into downtown Port Huron. This could also be a primary link should the eastern half of the Rails to River trail prove unfeasible.
- **Trail Connector Bike Route** – would link the CN Spur Trail to the Two Bridges Trail.

Rail to River Trail Overview

River to Rail Trail



Legend:

- Existing Off-Road Trail
- Existing On-Road Bike Route
- Proposed Off-Road Trail
- Proposed On-Road Bike Route
- Public Park
- Selected Large Private Properties
- Freeway
- Railroad
- Power Transmission Line - Owned
- Power Transmission Line - Easement
- Staging Area
- Interpretive Station
- At Grade Trail / Road Intersection
- Trail Bridge / Overpass
- Trail Underpass

The Rail to River Trail is highlighted in green

Key Recommendations:

- Bike lanes and a wide sidewalk/path along the north side of Griswold Road from the end of the Wadhams to Avoca Trail to Michigan Road.
- A Trail on the south side of Griswold Road from Michigan Road to 28th Street. The Trail may be constructed in either the Griswold Road ROW or it could be integrated into the redevelopment of the abandoned GTW Car Yard (a railroad car maintenance facility).
- Construct a Trail along the north side of the active CN Rail from 28th Street to Military Street.
- Provide an overpass over 24th Street and Crossing Island for at-grade crosswalks at 16th Street and 10th Avenue.
- Provide a series of interpretive stations that explore railroad transportation history and current activities.
- Provide staging areas at the eastern terminus of the Wadhams to Avoca Trail, 24th Street and 16th Street.

Rail to River Trail

The Rail to River trail is planned to be the primary link between the Wadhams to Avoca Trail and the Bridge to Bay trail. The Trail is about 3.6 miles long and generally parallels Griswold Road for the first half and the CN rail line for the second half.

Interpretive Theme

The proposed Rail to River Trail route connects a number of transportation related features:

- A number of abandoned railroads;
- The extremely busy Canadian National railroad that is significant to north American trade;
- A large switching yard for the international train tunnel;
- An abandoned turn table artifact that has the potential to be restored;
- An extensive abandoned car works site;
- An Amtrak passenger train terminal;
- The first and second Port Huron / Sarnia international train tunnels;
- The abandoned train ferry docks; and
- Desmond Landings Vantage Point, home of boatnerd.com.

All of these past and current transportation facilities present an almost unparalleled opportunity to explore Port Huron's role in rail and water transportation.

A series of interpretive signs are proposed to help the trail user better understand the relationships between the current and past transportation features. Beyond signs, two overlooks are proposed, one at the tunnel yards and the other at the international tunnels. These locations present the opportunity to create a more engaging interpretive experience by providing audio of the calls between the train controllers and the train engineers.

A similar train observation platform with a scanner to listen in to the radio traffic between trails has proven to be extremely popular a "The Folkston Funnel" which serves as the main artery for railroad traffic into and out of Florida. There is also an opportunity to coordinate the interpretive signs and overlooks along the trail with an exhibit at the Port Huron Museum.

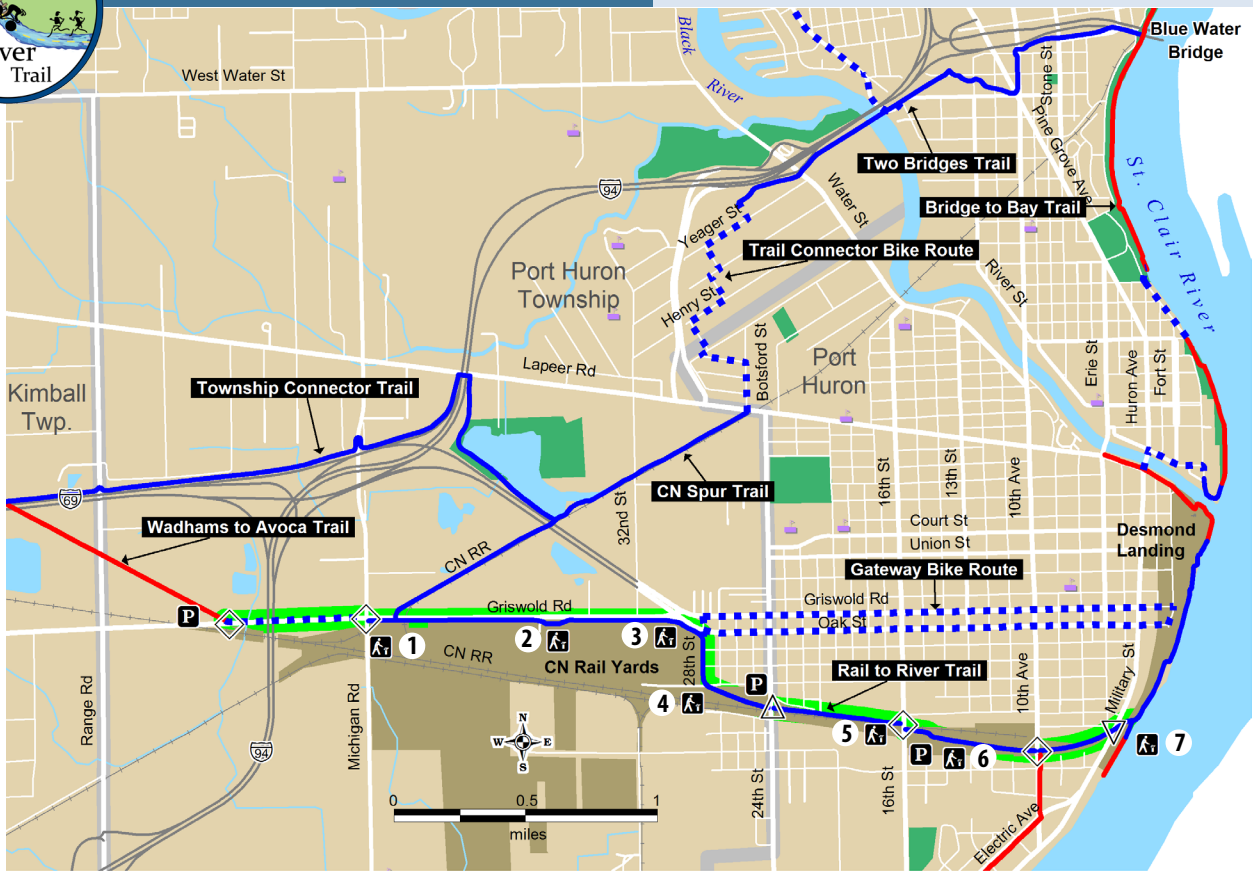
Property promoted the combination of viewing trains along the Rail to River Trail and freighters along the St. Clair River from Desmond Landing could provide to be a significant regional tourist draw.

Abandoned turn-table just south of Griswold between Michigan Road and 28th Street

Vantage Point at Desmond Landing

Rail to River Trail
Proposed Interpretive Stations

River to Rail Trail



Legend:

- Existing Off-Road Trail
- Existing On-Road Bike Route
- Proposed Off-Road Trail
- Proposed On-Road Bike Route
- Public Park
- Selected Large Private Properties
- Freeway
- Railroad
- Power Transmission Line - Owned
- Power Transmission Line - Easement
- Staging Area
- Interpretive Station
- At Grade Trail / Road Intersection
- Trail Bridge / Overpass
- Trail Underpass

See page 100 in Design Guidelines section for more detailed recommendations the design of the interpretive signs.

Key Recommendations:

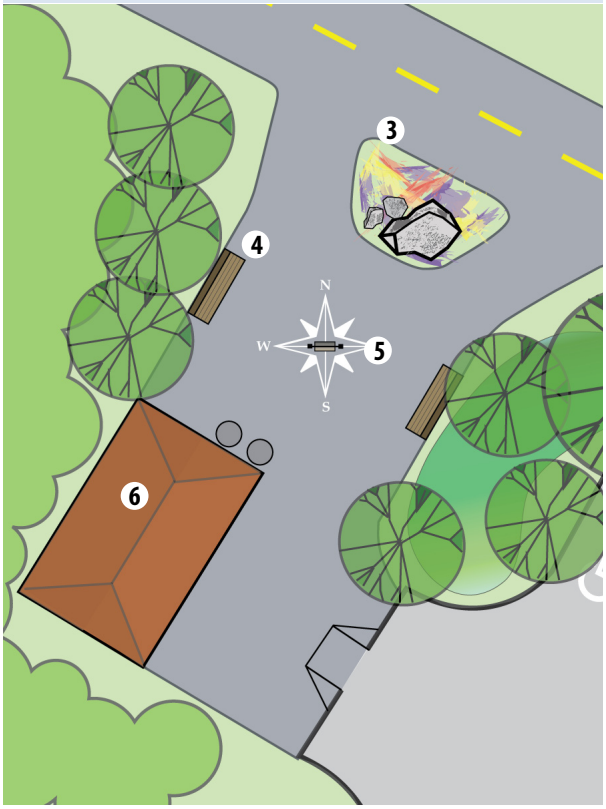
A total of seven interpretive signs are proposed, spaced out about every half mile.

1. Tunnel Yard Overlook - will explore how the current switching yard operates.
2. Turntable Relic - will look at the early days of the switching yard.
3. Grant Trunk Wester Car Shops - will explain the various repair functions performed at the now abandoned car shops.
4. Prairie Remnants - will look at the impact of railroad operations on vegetation.
5. Amtrak Depot - will explore passenger train service in the area.
6. International Rail Tunnels Overlook - will discuss the old and new tunnels and the international link.
7. Train Ferry Docks - will look at how train car ferry service worked.

Griswold Staging Area Design Concept

River to Rail Trail

Staging Area Detail



Key Recommendations:

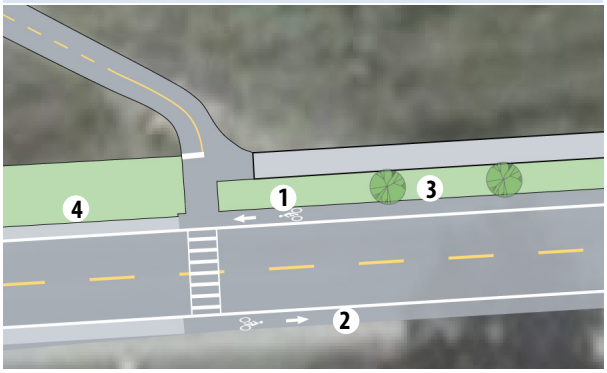
1. Entrance drive works with the existing and proposed realignment of Griswold Road.
2. Surface runoff from parking lot is collected into vegetated bio-swales where storm water is absorbed into the ground.
3. Landscaped feature with wildflowers and boulders.
4. Trail head kiosk sign displays a trail map and rules. The kiosk is sited upon the cardinal directions painted onto the ground plane to aid in user wayfinding.
5. Benches.
6. A prefabricated concrete double-vault toilet building.

See the Design Guidelines section for more detailed recommendations on the proposed structures, signs and site furnishings.

Griswold Road Design Concept

River to Rail Trail

Wadhams to Avoca Trail at Griswold Detail



Griswold Road I-94 Underpass

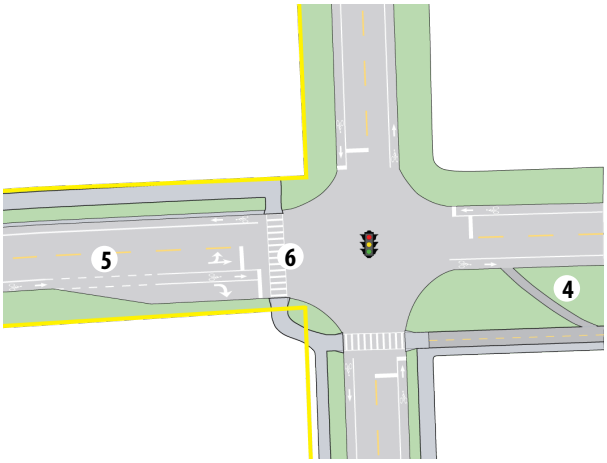
Key Recommendations:

1. At Griswold Road, the trail transitions to a wide sidewalk and bike lanes.
2. Bicyclists, based upon their comfort level, have a choice to ride in the bike lanes and avoid potential conflicts with motorists at driveway crossings or to ride on the wide sidewalk yielding to pedestrians.
3. Planted landscape buffer between the road and the side path.
4. West of the off-road trail, the bike lanes transition into paved shoulders along the proposed Griswold Road realignment.

Griswold Road Design Concept

River to Rail Trail

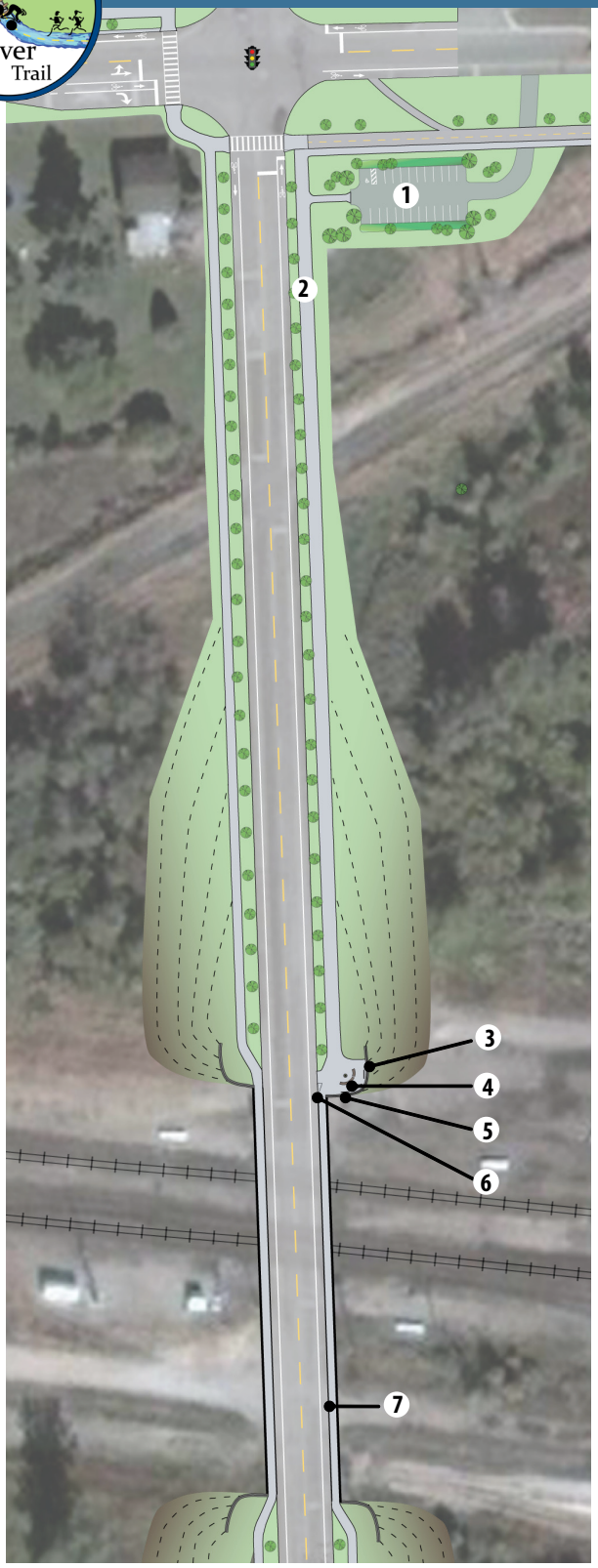
Griswold Rd/Michigan Rd Intersection Detail



Key Recommendations:

1. An 8’ wide sidewalk suitable for pedestrians and youth cyclists.
2. Consolidate driveways to minimize conflicts with pedestrians and cyclists.
3. A signalized intersection is proposed as part of the Michigan Road overpass project; include pedestrian countdown signals and crosswalks as part of that project.
4. A ramp allows cyclists in the bike lane to access the shared use path.
5. A pocket bike lane to minimize conflicts with right turning vehicles.
6. An advance stop bar for the bike lane and right turn only lane improves bicyclist’s visibility and improves sightlines for right-on-red turners lessening the likelihood they will pull forward and block the crosswalk.

Tunnel Yard Overlook Design Concept



Tunnel Yard Overlook

The proposed reconstruction of the bridge on Michigan Road holds great opportunity to incorporate an overlook to the active rail lines. The overlook would have interpretive signs, benches and lighting and serve as a destination along the trail.

View of Tunnel Yard

Key Recommendations:

1. Provide an approximately 24 car parking lot for tunnel yard overlook.
2. An 8’ wide sidewalk linking the Rail to River Trail to the overlook.
3. Keep the top of the abutment level to create the overlook and add a railing.
4. Provide benches and area lighting.
5. Interpretive signs that explore the history and current workings of the tunnel yard. A scanner to listen in to the ratio traffic between trails.
6. Provide a ramp from the bike lane to the overlook area.
7. Sidewalk separated from the roadway with a railing.

24th Street Staging Area Design Concept

River to Rail Trail

View of Staging Area Location

View from 24th Street looking west into the proposed staging area.

Key Recommendations:

The 24th Street staging area is proposed where an informal dirt parking lot exists.

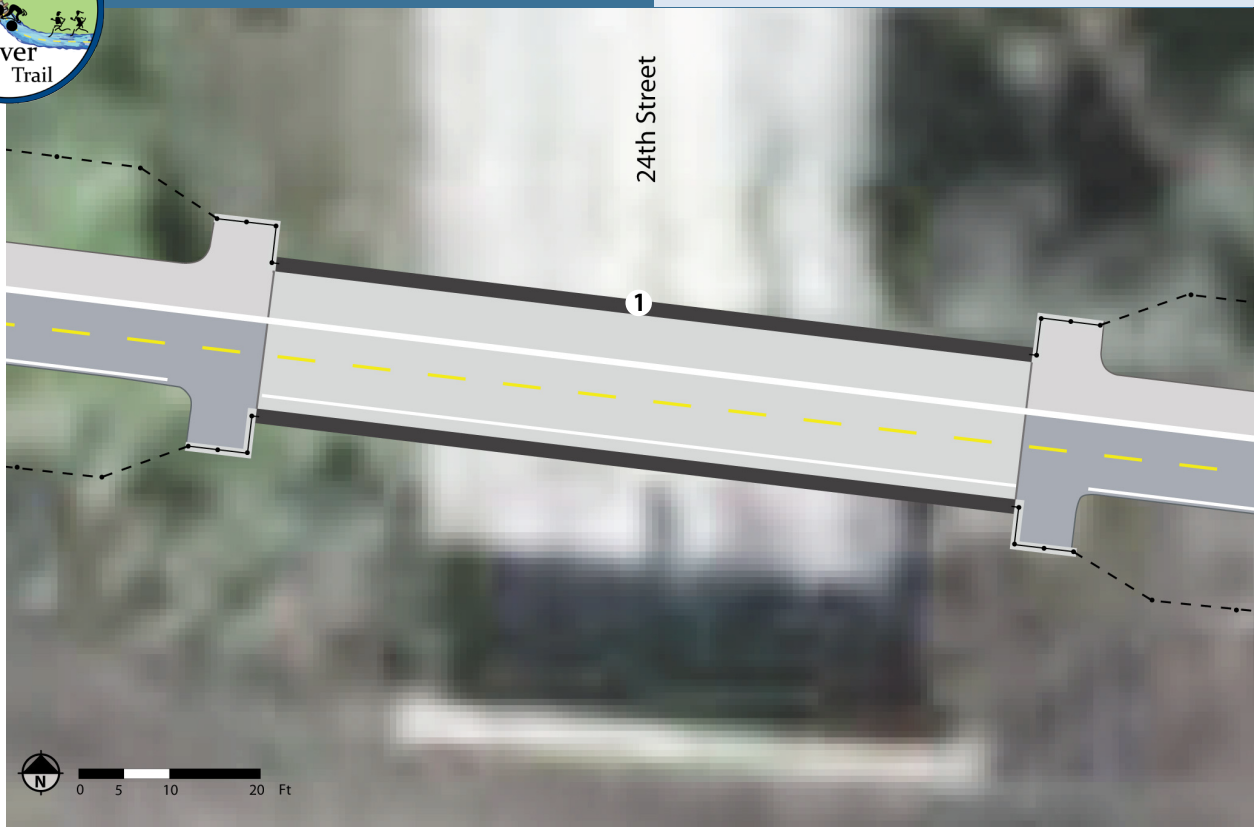
1. Provide an approximately 24 car space parking lot.
2. Surface runoff from parking lot is collected into vegetated bio-swales where storm water is absorbed into the ground.
3. Area for temporary parking or future expansion of parking lot.
4. Trail head kiosk.

The land for the staging area needs to be secured through a long-term lease or purchased from CN's GTW subsidiary.

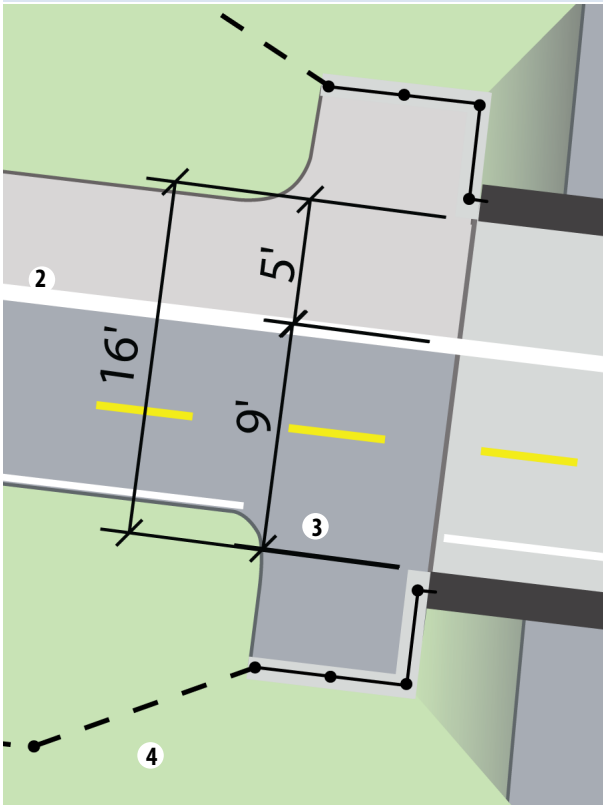
See the Design Guidelines section for more detailed recommendations on the proposed structures, signs and site furnishings.

24th Street Bridge Plan View

River to Rail Trail



Abutment Plan View Detail



Key Recommendations:

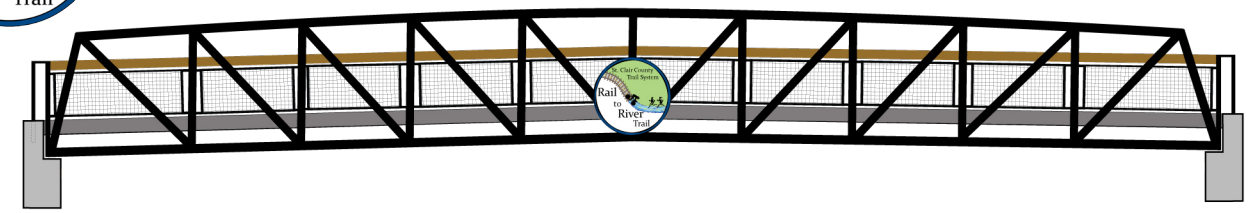
1. 16’ wide pedestrian bridge with concrete decking.
2. Separated use path with pavement markings between the sidewalk and the bike path.
3. Trail pull-off with railing on top of abutment.
4. Fencing separating trail from active rail line.

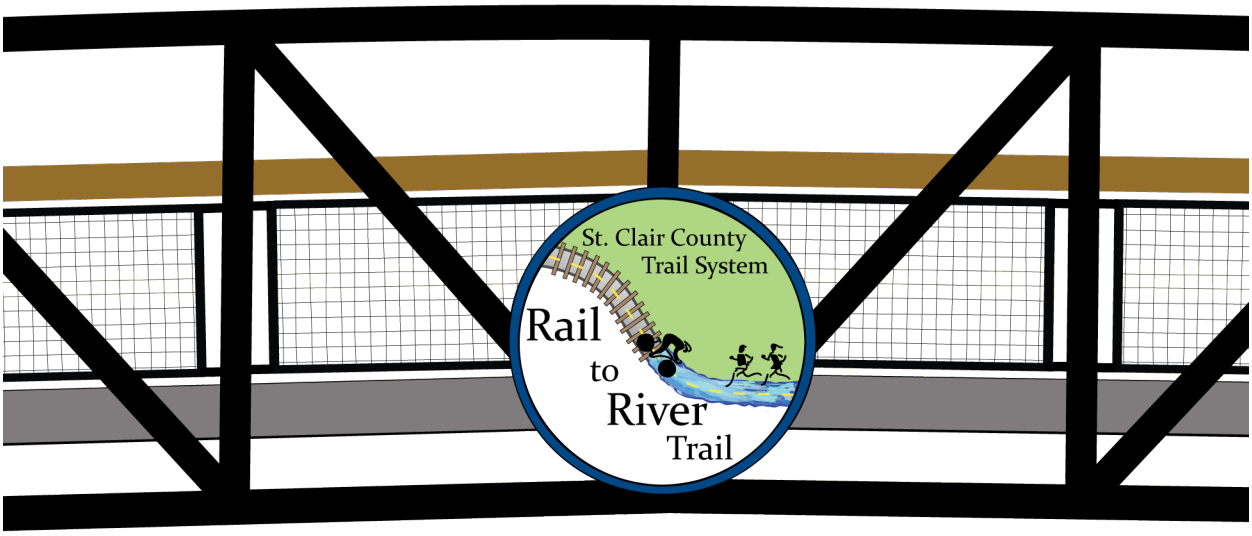
Overpass Location

View of the railroad overpass from 24th Street looking to the south.

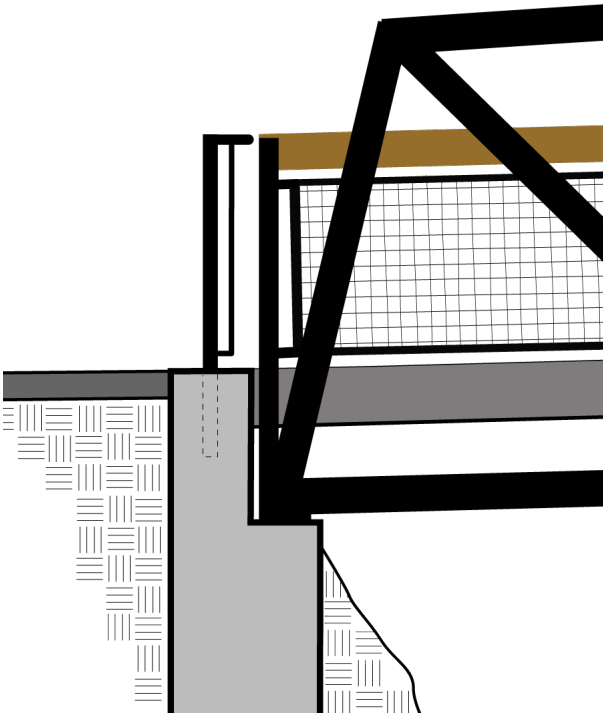
24th Street Bridge Elevation

River to Rail Trail

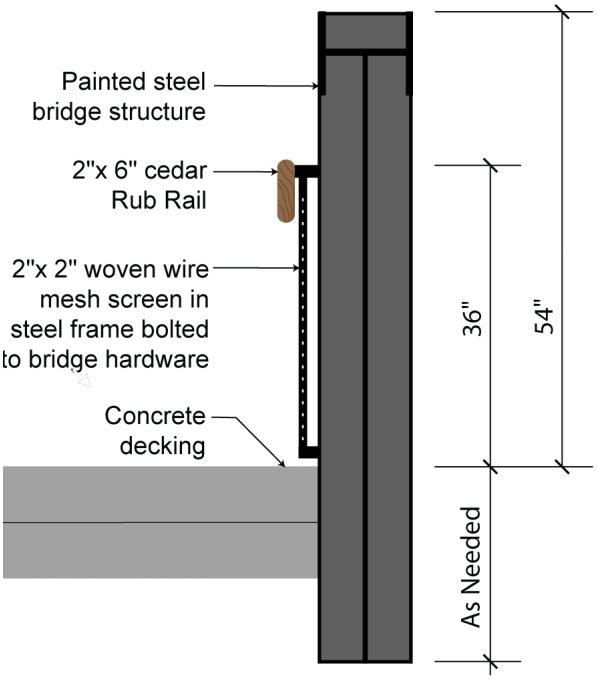




Abutment Section Detail



Railing Section Detail



16th Street Crossing Design Concept

River to Rail Trail

Crossing Location View

View of 16th Street looking to the East

The proposed 16th Street crossing improves motorist safety at the railroad crossing by eliminating the ability of motorists to by-pass the gates. As such it qualifies for special funds allocated towards improving railroad crossing safety.

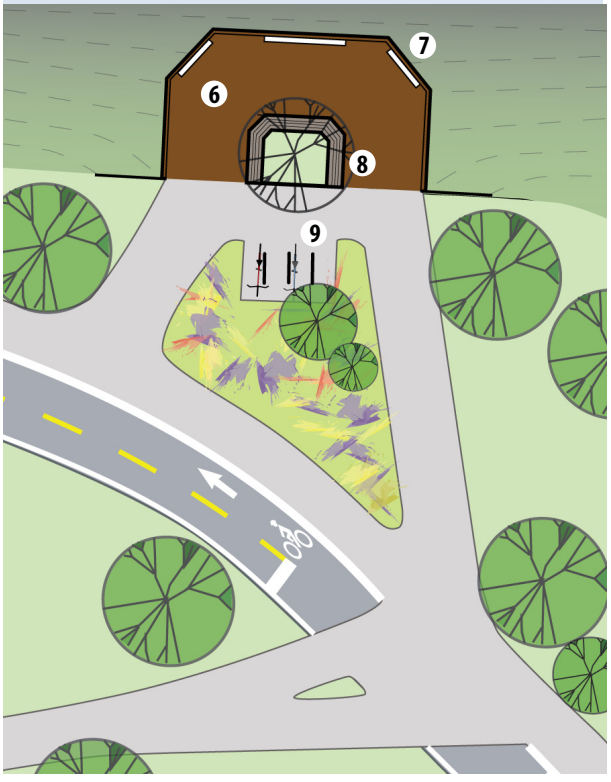
Key Recommendations:

1. Flare the east side of 16th Street to include a mid-block zig-zag crossing island. The crosswalk is staggered to direct the pedestrian view towards oncoming traffic.
2. Route trail north of rail operations building, easement from adjacent property owner, Pepsi Cola, Inc. required.
3. Extend the crossing island south of railroad to prevent cars from weaving through the crossing gates, increasing the safety of the crossing. Include reflective breakaway bollards on nose of island.
4. Relocate crossing gate and add additional arm for pedestrian crossing.
5. Construct a berm to encourage trail users to follow the path alignment.

16th Street Staging Area Design Concept

River to Rail Trail

Overlook Plan View Detail

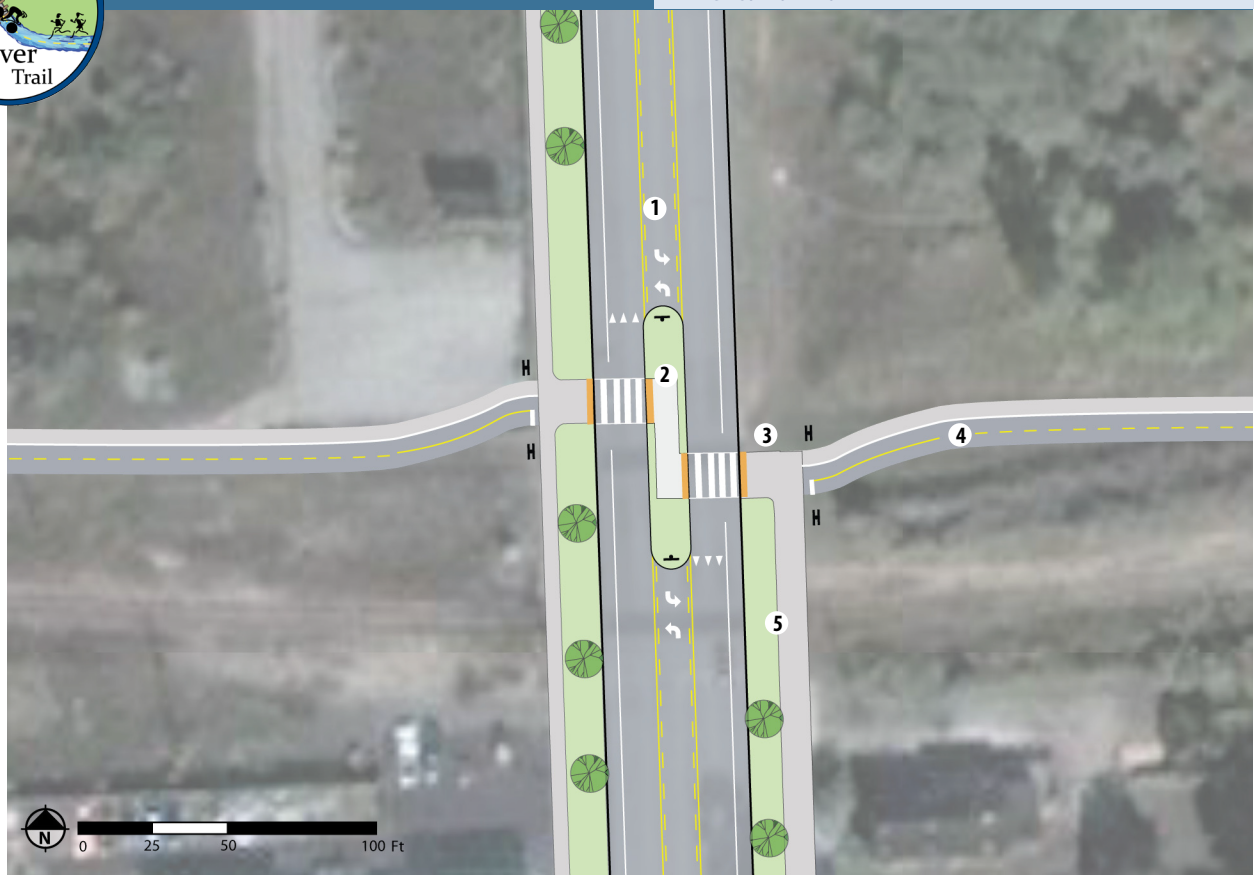


Key Recommendations:

1. Align entrance with Amtrak depot drive across 16th Street.
2. A pedestrian's right of way is reinforced by the concrete walkway breaking the asphalt bike path where they intersect.
3. Shaded picnic area with accessible table.
4. A prefabricated concrete double-vault toilet building.
5. Surface runoff from parking lot is collected into vegetated bio-swales where storm water is absorbed into the ground.
6. Railroad overlook platform extending over edge of the railroad tunnel cut.
7. Interpretive signs - see Design Guidelines.
8. Built-in bench around opening for shade tree.
9. Inverted "U" style bike parking.

10th Street Crossing Design Concept

River to Rail Trail



Crossing Location View

View of 10th Street at the proposed crossing location looking North.

Key Recommendations:

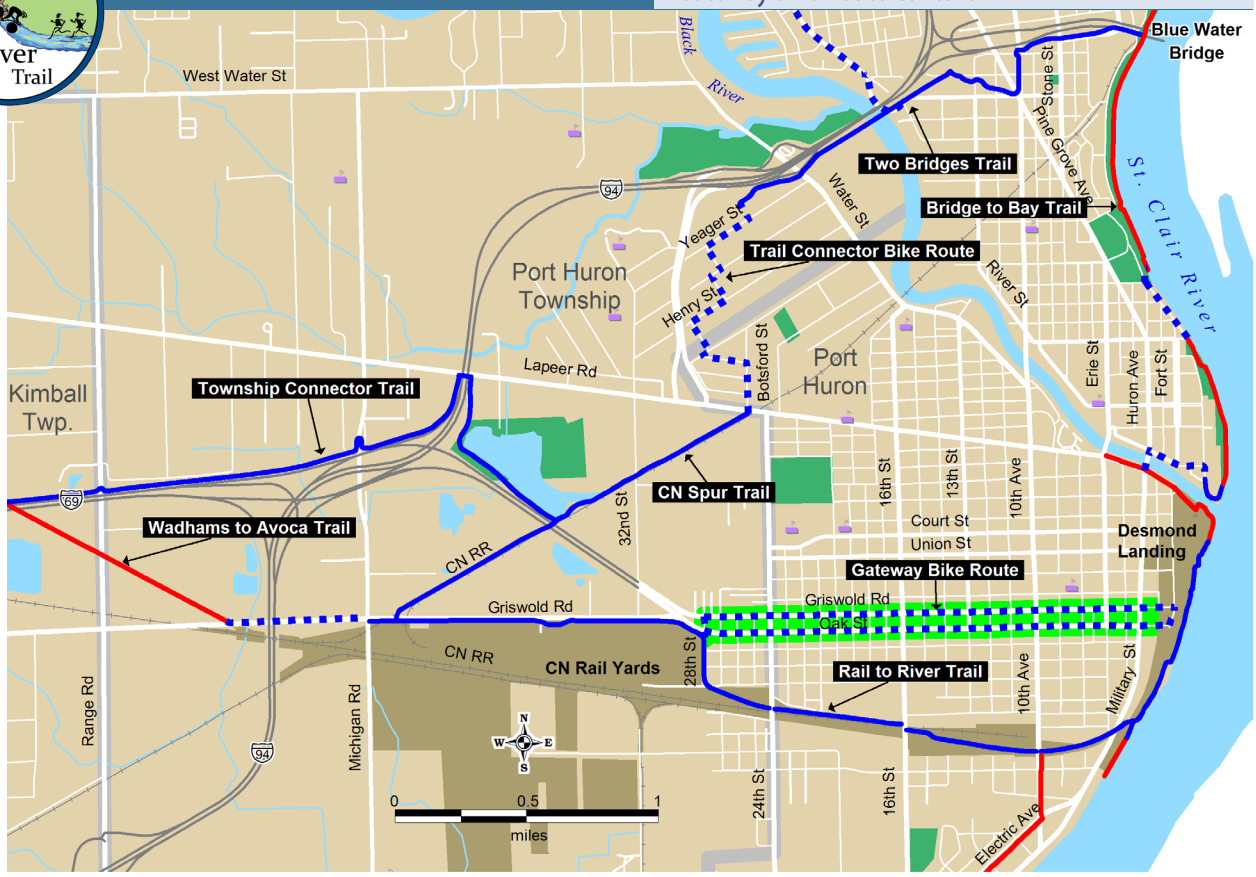
1. Restripe 10th Street from a four lane road to a three lane road with Bike Lanes as the four lanes are no longer needed for vehicle staking at the railroad crossings and the center turn lane may be used for a crossing island.
2. Mid-block zig-zag crossing island to direct the pedestrian view towards oncoming traffic.
3. Trail crossing signs, see Design Guidelines.
4. Separated use path.
5. 10’ shared use path.

The implementation of the western half of the trail (from the Wadhams to Avoca Trail to 28th Street) has been designed to coordinate with the proposed Michigan Street overpass project. An overlook of the tunnel yard is proposed to be integrated into the abutment of the proposed bridge. Also, the Lapeer Road and Michigan Street intersection are proposed to be reconstructed as part of that project and the trail crossing of that intersection could be integrated into that project. However, the trail could be constructed without the overpass project.

The implementation of the east half of the trail (from 28th Street to the Military Street) is dependent on obtaining easement and/or purchasing property from CN Railroad. While initial discussions have been positive many details including the cost of the property need to be worked out. Should the eastern section become delayed or deemed too expensive, two alternatives exist. First, Division Street, or another eastwest neighborhood street, may be signed as a bike route from 28th Street to Military Street. Second, Business Route 69, the one-way pair of Oak Street and Griswold Road, are scheduled to be reconstructed in the not too distant future. The inclusion of features such as bike lanes and curb extensions has already been discussed as a potential part of the reconstruction project.

The abandoned GTW car shop buildings

International train tunnel entrance



Legend:

- Existing Off-Road Trail
- Existing On-Road Bike Route
- Proposed Off-Road Trail
- Proposed On-Road Bike Route
- Public Park
- Selected Large Private Properties
- Freeway
- Railroad
- Power Transmission Line - Owned
- Power Transmission Line - Easement
- Staging Area
- Interpretive Station
- At Grade Trail / Road Intersection
- Trail Bridge / Overpass
- Trail Underpass

Key Recommendations:

- Add bike lanes the length of Griswold Road and Oak Street.
- Improve mid-block crossings via curb extensions.
- Improve the street appearance with street trees, planting beds, pedestrian scale lighting, and a wayfinding system.

The Gateway Bike Route highlighted in green.

Gateway Bike Route

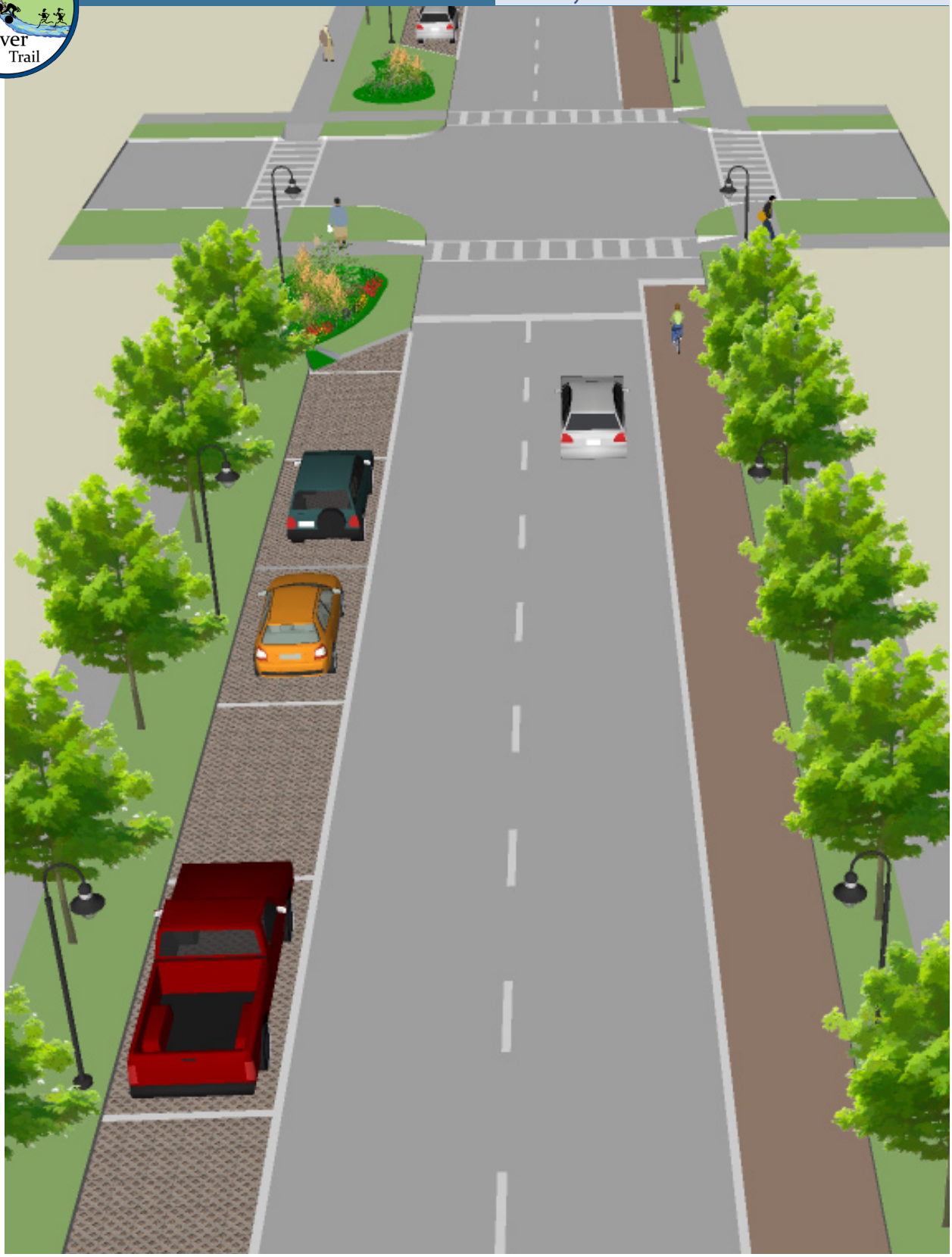
The Gateway Bike Route functions on two levels; as an alternative eastern portion of the Rails to River Trail as well as a worthwhile project all by itself. It would greatly enhance the entrance to Port Huron while improving bicycle and pedestrian accommodations along and across the corridor.

Business Route 69, comprised of the one-way pair of Oak Street and Griswold Road, are in line to be reconstructed in the near future. Current discussions have discussed including bike lanes and curb extensions as part of that reconstruction. With the addition of street trees, pedestrian scale lighting, and other features there is the potential to transform what is currently a bland and unappealing entrance to downtown Port Huron into a first class entrance fitting the increasing role of tourism in Port Huron's economy.

Bicyclists along Oak Street

Oak and Griswold Complete Street Design Concept

Gateway Bike Route



Oak and Griswold Complete Street Design Concept

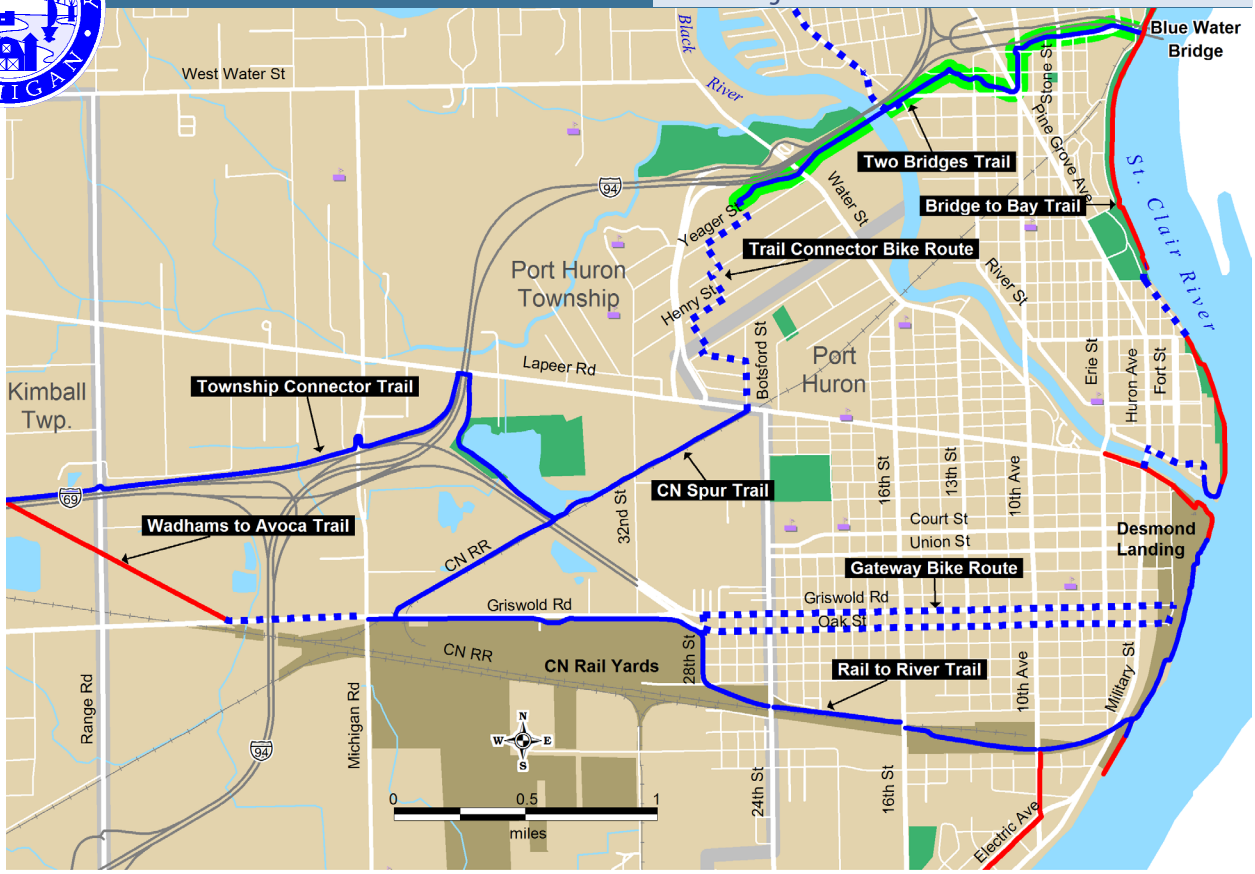
Gateway Bike Route

By narrowing the travel lanes, adding a bike lane, providing curb extensions at the intersections and other elements, Oak and Griswold Street will become an attractive gateway to Port Huron. The design of the roadway should encourage drivers to travel at a speed that is more appropriate to the residential area with multiple school crossings.

Key Recommendations:

- Two through lanes with bike lane in colored concrete or asphalt.
- Move parking to left side of street and pave with permeable pavers.
- Utilize curb extensions at crosswalks and incorporate rain gardens planted with native shrubs and colorful flowers. These rain gardens will both infiltrate storm water and add an aesthetic amenity to the road corridor.
- Advance stop bar for bike lane and marked ladder style crosswalks.
- Place approximately 14’ tall pedestrian scale street lights about every 60’.

Two Bridges Trail Context



Legend:

- Existing Off-Road Trail
- Existing On-Road Bike Route
- Proposed Off-Road Trail
- Proposed On-Road Bike Route
- Public Park
- Selected Large Private Properties
- Freeway
- Railroad

The Two Bridges Trail is Highlighted in green.

Key Recommendations:

1. Connect the proposed non-motorized pathway on the Black River Bridge reconstruction project to a pathway that leads to the Bridge to Bay Trail.
2. Provide a shared-use pathway connection around the proposed Blue Water Bridge plaza project.

Two Bridges Trail

MDOT is conducting a feasibility study to rebuild the Blue Water Bridge Plaza to improve border security, reduce congestion and accommodate projected traffic growth. As part of this project, MDOT will be replacing the Black River Bridge and has designed for pedestrian facilities to be included on the new bridge. The Blue Water Bridge Trail design concept links the pedestrian crossing on the Black River Bridge to the Bridge to Bay Trail along the St. Clair Riverfront.

Two Bridge Trail Design Overview

The proposed design combines security, sustainability, non-motorized transportation and aesthetic elements. The security elements include a low retaining wall that surrounds the proposed toll plaza that is designed to stop vehicles. Just in front of the wall is a bio-swale that has softer soils and a slight depression which also help deter vehicles. Behind the low retaining wall is a security wall that is used to deter pedestrian access. The plantings are arranged with the large trees far enough away from the wall so they may not be used to get over the wall and to provide clear sightlines along the wall. Also, mid-height non-woody native plant material is used in front of the large wall.

The sustainable elements include a six to eight inch deep bio-swale that is used to collect, filter and infiltrate storm water. The bio-swale will be planted with lower height native plants that can tolerate occasional submersion in water as well as dry soils. Between the tall pedestrian security wall and the low vehicle barrier wall, short grass prairie plants are proposed. The prairie will be comprised of native grasses and flowers generally less than 3' tall that will be tolerant of dry conditions. These plants have the advantage of not needing any long-term irrigation as well as having an immediate impact that will not change in height over time.

A shared-use path links the proposed non-motorized pathway on the south side of the proposed Black River Bridge to the Bridge to Bay Trail. Extensive uses of crossing islands are used at pathway / roadway intersections to enhance the safety of the trail users. At the east end of the pathway the trail is aligned between the two spans of the Blue Water Bridge providing an outstanding perspective of the structures.

The combined elements provide a layered approach that minimize the imposing presence of a security wall and incorporate a variety of plant materials. The wall in the landscape setting could become very sculptural with a sinuous form, textured surfaces and artful landscape up-lighting. In addition, elements such as a tile mosaic of the Blue Water Bridge where north bound Pine Grove Ave is directed at the south end of the Toll Plaza Complex would enhance the image of the City.

At the eastern terminus of the Two Bridges Trail the trail will run between the two spans of the Blue Water Bridge

Proposed Toll Plaza Design Concept

Two Bridges Trail

Key Recommendations:

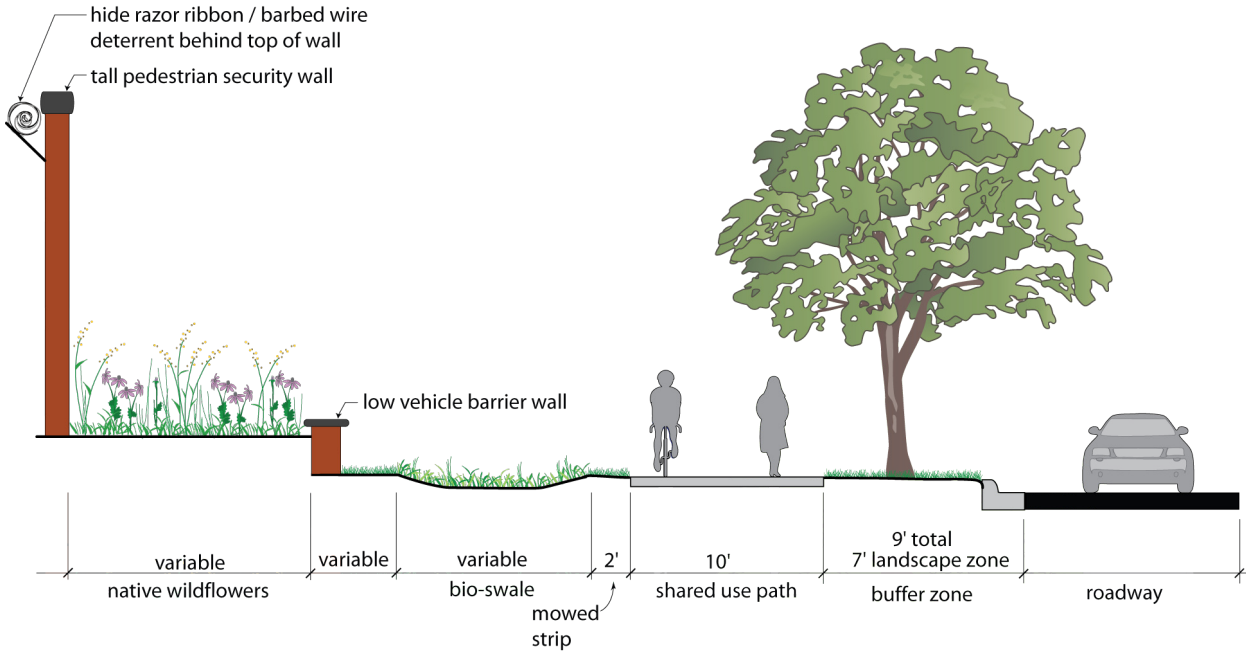
- Provide for safe crossing at Pine Grove by extending the crossing island through the cross walk as well as through the roundabout.
- Tighten radius on entrance drive to slow right turning vehicles from Pine Grove into Plaza.

Proposed Toll Plaza Design Concept

Two Bridges Trail

Key Recommendations:

- Provide a 10’ side path along 10th Avenue.
- Enhance plantings along security wall and trail to improve aesthetics and allow for storm water infiltration.

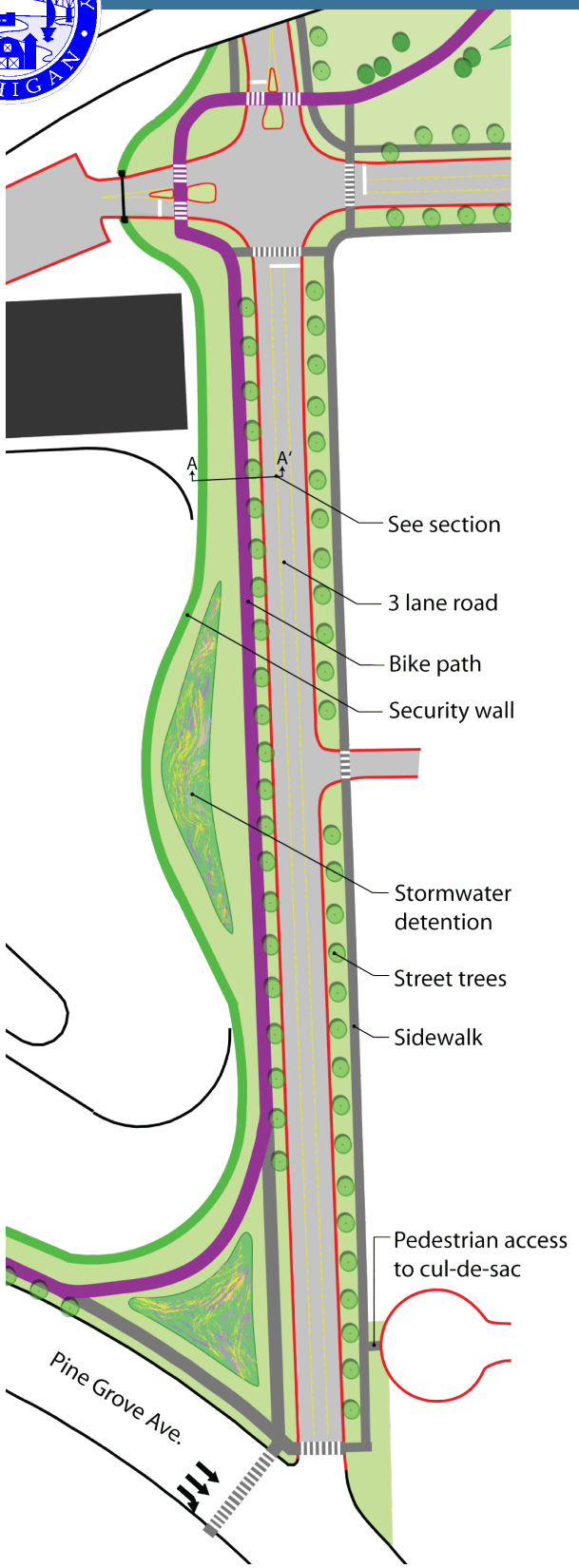


Key Recommendations:

- A layered design of security walls creates a more pleasing pedestrian experience while maintain border security.
- The low retaining wall is designed to stop vehicles and the tall security is used to deter pedestrian access.
- Vegetation is used to soften the visual appearance of the Plaza security walls while improving storm water infiltration through a planted bio-swale as well as maintain open site lines through the use of native grasses and wildflowers.

10th Avenue Cross Section

Two Bridges Trail

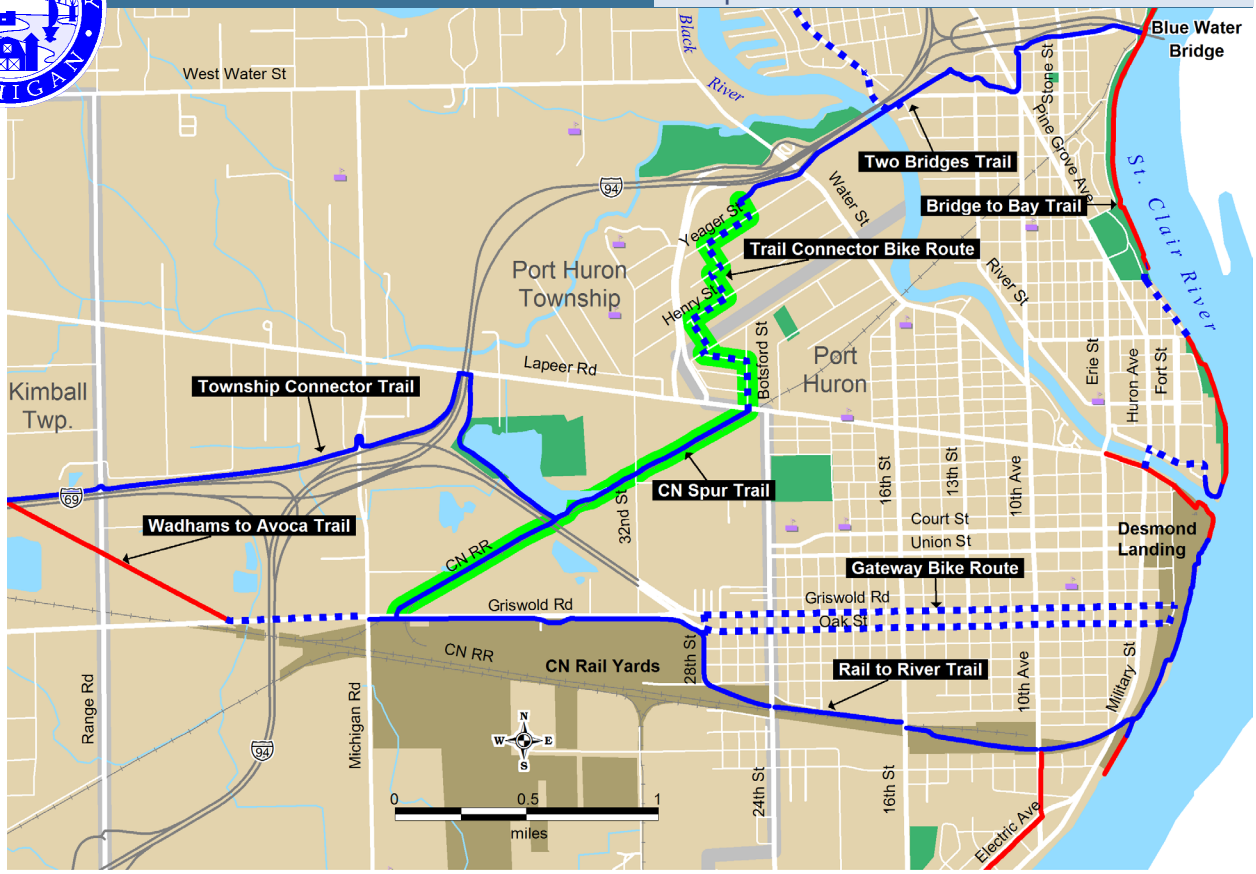


Key Recommendations:

- A 10’ shared use path along the wall of the security plaza.
- Extend refuge islands as the path crosses the intersection of 10th Ave and Harker Street.
- Provide pedestrian access from 10th Ave through to cul-de-sac.

CN Spur Trail/ Trail Connector Bike Route Context

CN Spur Trail/Trail Connector Bike Route



Legend:

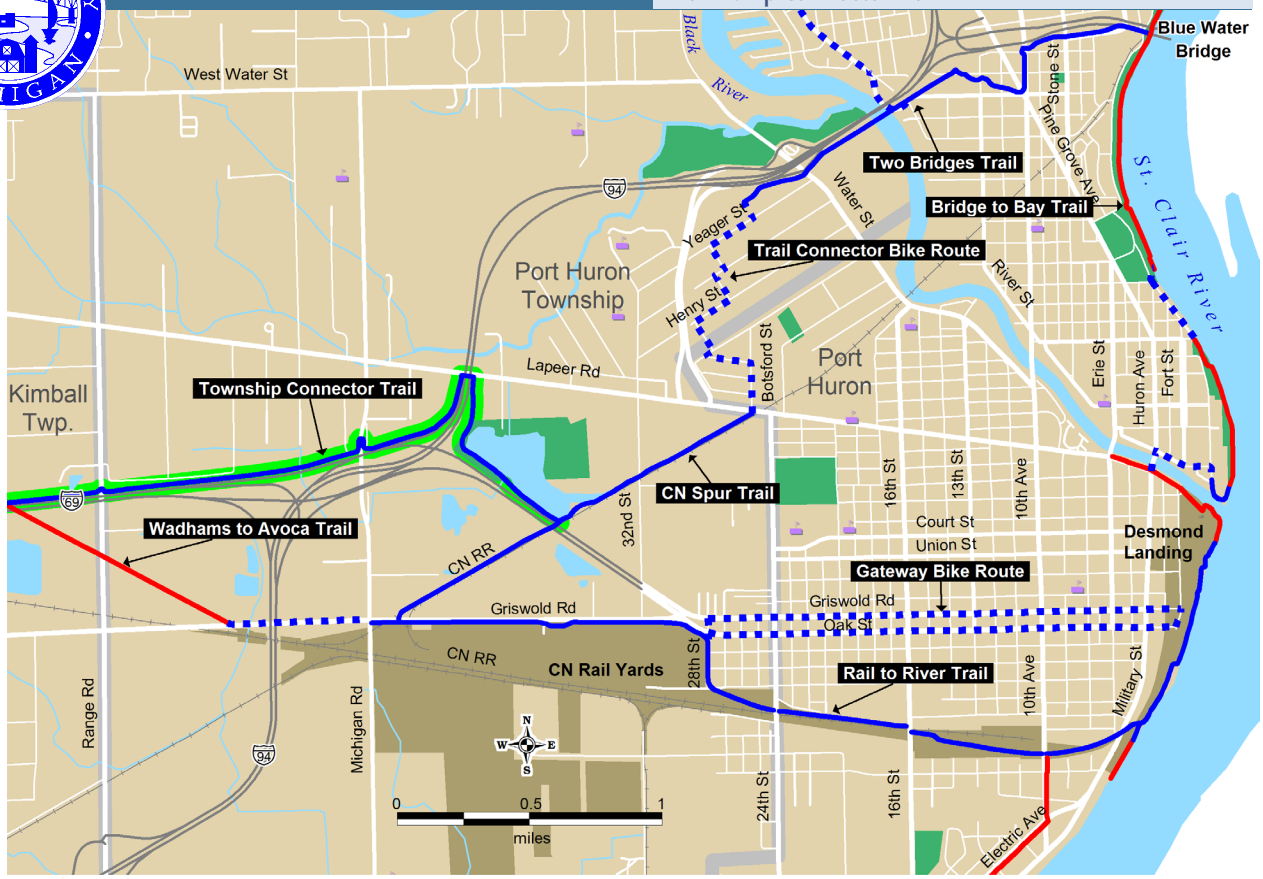
- Existing Off-Road Trail
- Existing On-Road Bike Route
- Proposed Off-Road Trail
- Proposed On-Road Bike Route
- Public Park
- Selected Large Private Properties
- Freeway
- Railroad

The CN Spur Trail and the Trail Connector Bike Route are highlighted in green.

Key Recommendations:

1. Establish a link between the River to Rail Trail and the Two Bridges Trail and that links up the Port Huron Township Park at the juncture of I-94 and BR I-94.
2. Place a trail within and/or adjacent to the CN Railroad ROW between Gratiot Road and Lapeer Road.
3. Sign a bike route on the neighborhood roads between Lapeer Road and the western terminus of the Two Bridges Trail.

Township Connector Trail Context



Legend:

- Existing Off-Road Trail
- Existing On-Road Bike Route
- Proposed Off-Road Trail
- Proposed On-Road Bike Route
- Public Park
- Selected Large Private Properties
- Freeway
- Railroad

The Township Connector Trail is highlighted in green.

Key Recommendations:

1. Provide a trail through Kimball and Port Huron Townships that links the neighborhoods in those communities with the Rail to River Trail and the CN Spur Trail.
2. Connect to the Port Huron Township Park at the juncture of I-94 and BR I-94.
3. Place the trail within the MDOT ROW for I-94.
4. Go under I-94 at Lapeer Road.

Section 4

Macomb Orchard Trail/ Bridge to Bay Trail Connectors

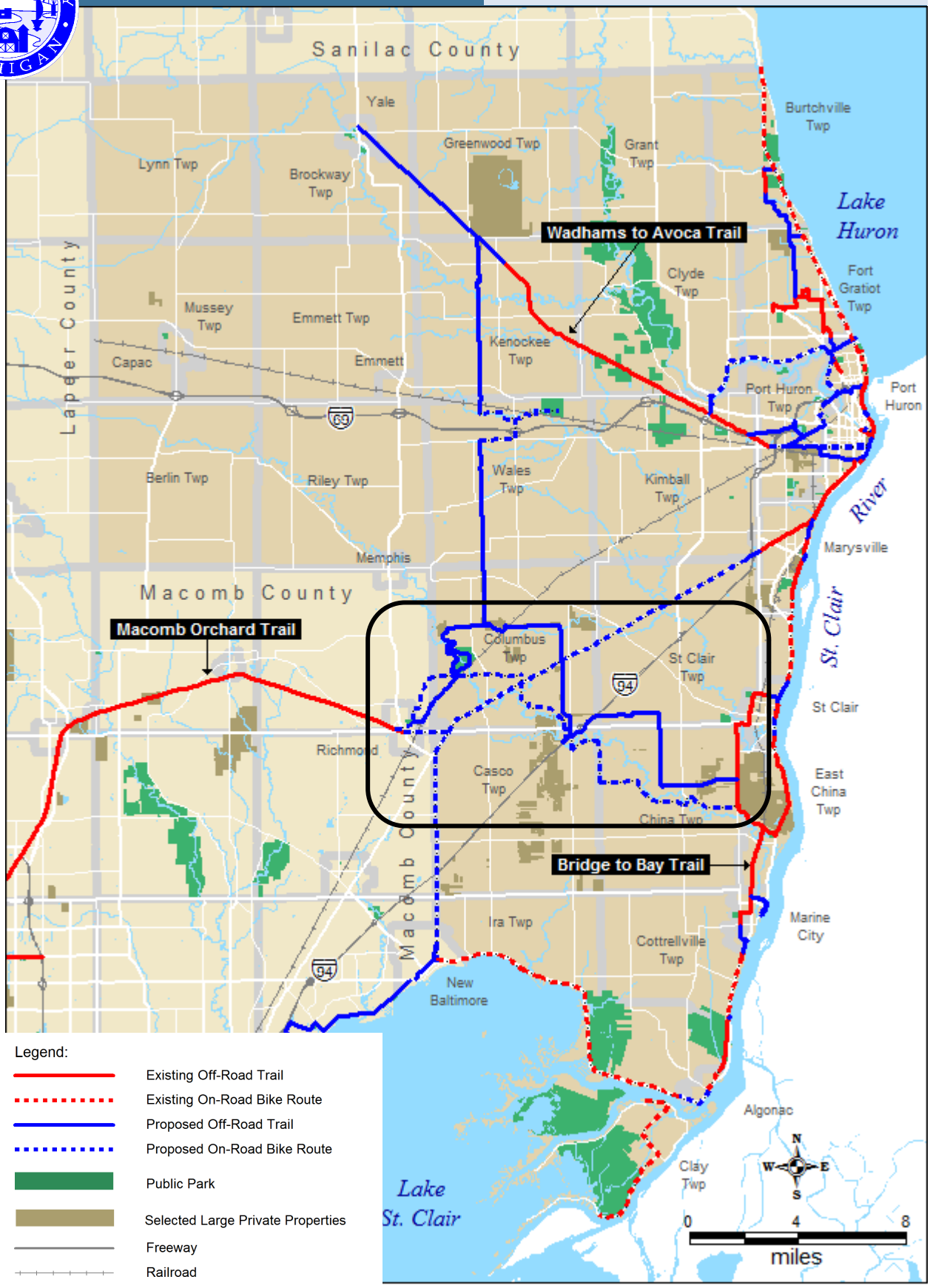
CN Trail/ Power Line Trail

Park Link Bike Route

Belle River Way Bike Route

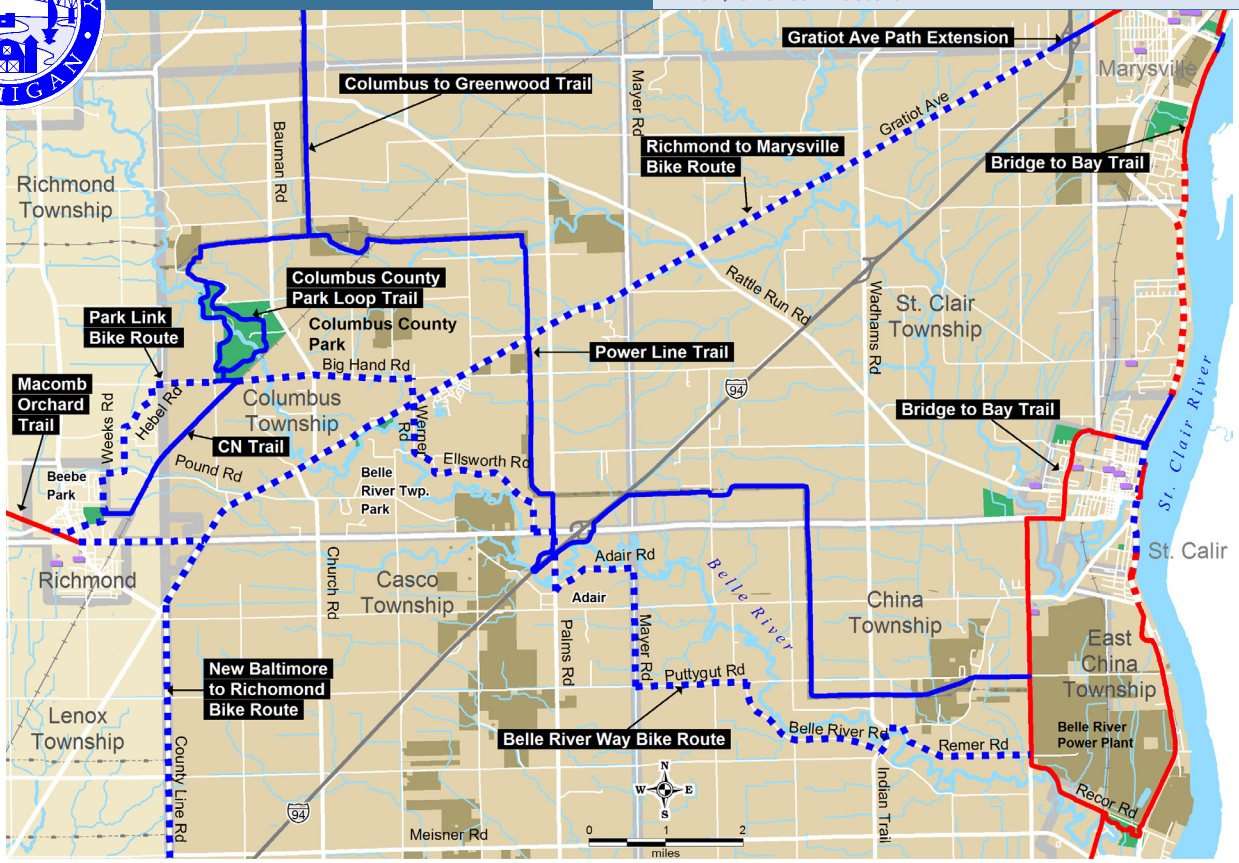
Macomb Orchard Trail/ Bridge to Bay Connectors Context

MOT/ BTB Connectors



Macomb Orchard Trail/ Bridge to Bay Connectors Overview

MOT/ BTB Connectors



Legend:

- Existing Off-Road Trail
- Existing On-Road Bike Route
- Proposed Off-Road Trail
- Proposed On-Road Bike Route
- Public Park
- Selected Large Private Properties
- Freeway
- Railroad

Proposed Off-Road Trails:

The following three trails make up the primary off-road link between the Macomb Orchard Trail and the Bridge to Bay Trail:

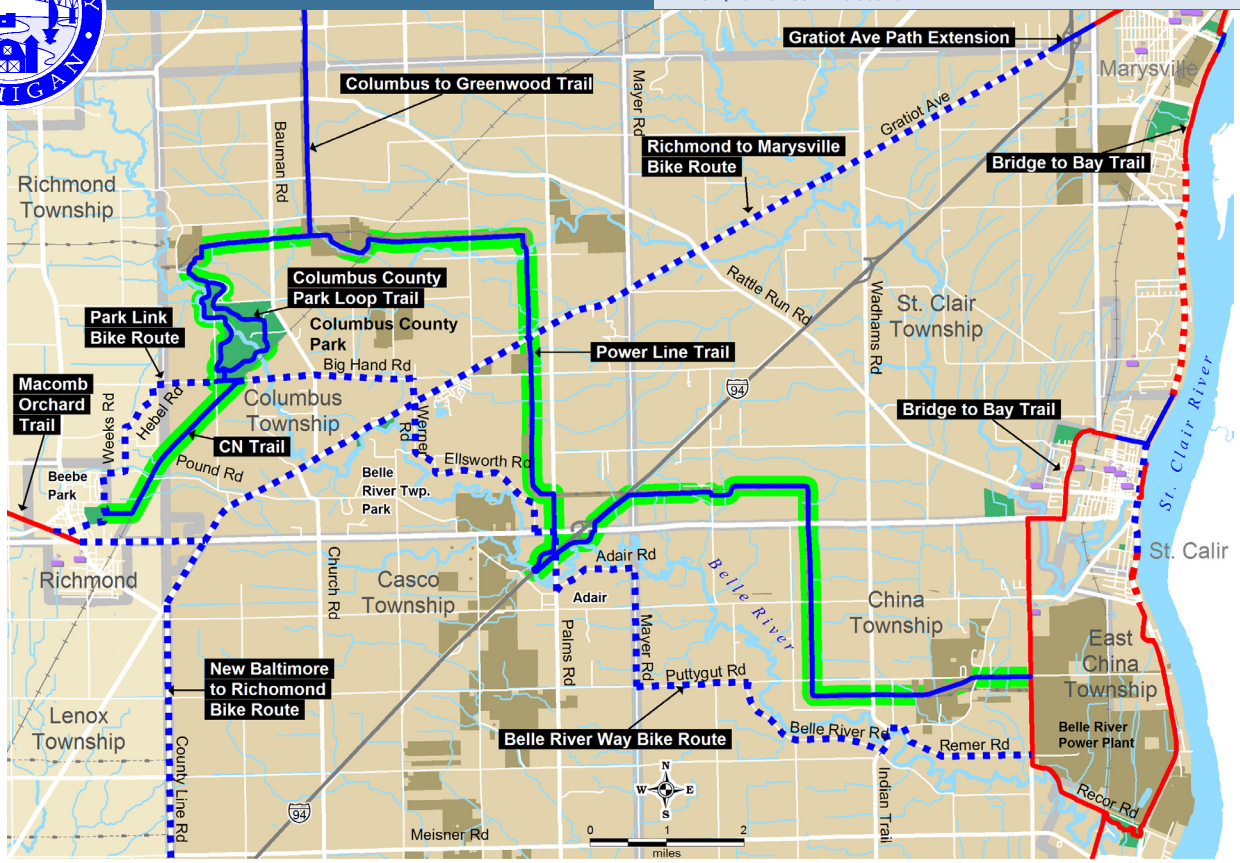
- **CN Trail** – a Rails-with-Trail that connects Richmond to Columbus County Park;
- **Columbus County Park Loop** – this loop trail also links the CN Trail and the Power Line Trail; and
- **Power Line Trail** – this trail within a Transmission Corridor links Columbus County Park and the Bridge to Bay Trail

Proposed On-Road Bike Routes:

- **Park Link Bike Route and the Belle River Way Bike Route** – provide an immediate low cost link between the Macomb Orchard Trail and the Bridge to Bay Trail; and
- **Richmond to Marysville Bike Route** – is a longer term link primarily along Gratiot Ave.

CN Trail and Power Line Trail Overview

MOT/ BTB Connectors



Legend:

- Existing Off-Road Trail
- Existing On-Road Bike Route
- Proposed Off-Road Trail
- Proposed On-Road Bike Route
- Public Park
- Selected Large Private Properties
- Freeway
- Railroad

The CN Trail and Power Line Trail are highlighted in green.

Key Recommendations:

- An approximately 26.4 mile trail connection.
- Provide a Shared Use Trail adjacent to the CN Railroad from Richmond to Columbus County Park.
- Provide an approximately four and a half mile long loop trail within Columbus County Park.
- Provide a Shared Use Trail within the ITC Transmission Corridor between Columbus County Park and Palms Road.
- Provide a Shared Use Trail on the East Side of Palms Road, go under I-94 at the Belle River Bridge and follow the east side of the I-94 ROW to the ITC Corridor.
- Provide a Shared Use Trail in the ITC Transmission Corridor from I-94 to just west of King Road.
- Transition the Trail from the ITC Corridor to Puttygut Road and place the trail on the south side of Puttygut until King Road.

CN Trail and Power Line Trail

The CN Trail in Combination with the Power Line Trail will serve as the long-term off-road trail linking the Macomb Orchard Trail and the Bridge to Bay Trail. These two trails will also provide a nonmotorized route to Columbus County Park. The total distance is about 26.4 miles and would take about two and a half to four hours to travel by bike.

The CN Trail links Richmond's Beebe Park to Columbus County Park. The route requires obtaining easements as it crosses privately held land. The trail may be within the CN ROW and/or the private property that adjoins the railroad. For the most part the property that lies to the west of the railroad is in agricultural use and the parcels are of substantial size. This should make obtaining easements easier.

The Power Line Trail is located primarily within a 320' wide high voltage transmission corridor owned by ITC Transmission. The trail will need to obtain an easement from ITC. This should be feasible as ITC has a policy for granting easements to trails and preliminary discussions with ITC have been positive. There are three places though where the trail is needs to obtain easements from other landholders due to a gap in ITC ownership of the corridor. The first location is just south of Big Hand Road and the gap is 2,800' with a single land owner. The other two gaps in ownership are on either side of Allington Road, just north of Fred W. Moore Highway. To the west of Allington Road the gap is 660' long, east of Allington Road the gap is 1,400' long. All three gaps are currently undeveloped and there exists a service drive.

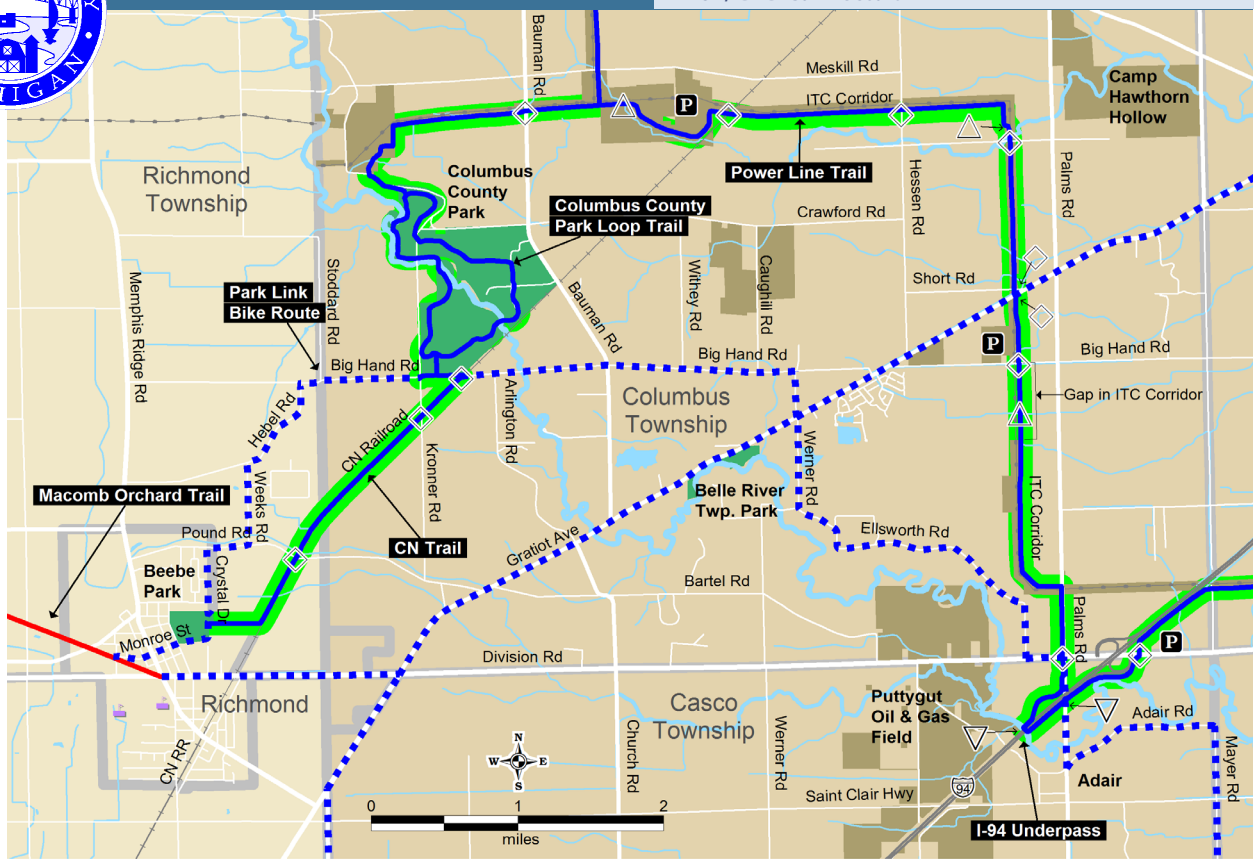
The biggest hurdle for the PowerLine Trail is I-94. While a freeway overpass would be ideal, the cost would likely be prohibitive. The proposal shows the trail leaving the ITC corridor and going south along Palms Road to the I-94 ROW and then under I-94 at the Belle River bridge. The trail then follows the I-94 ROW north, going under the Puttygut Road overpass, to the ITC corridor. There is enough headroom to go under the I-94 bridge at the Belle River but the path would likely be flooded in the spring requiring frequent maintenance to clear sediment. The Palms Road overpass provides an alternative when this section of trail is flooded. Palms Road is a relatively low volume road and there is a shoulder on the overpass. The Palms Road overpass could also serve as the permanent I-94 crossing point should the I-94 underpass prove unfeasible.

The Clinton River Trail in Rochester Hills Michigan used a recycled asphalt surface that has been well received by trail users. This may be an ideal surface for the CN and Power Line Trails if the construction of the trail can be coordinated with a near-by road reconstruction project.

The I-94 and Puttygut Road Underpasses could be constructed similar to this underpass under US 31.

CN Trail and West End Of Power Line Trail

MOT/ BTB Connectors



Legend:

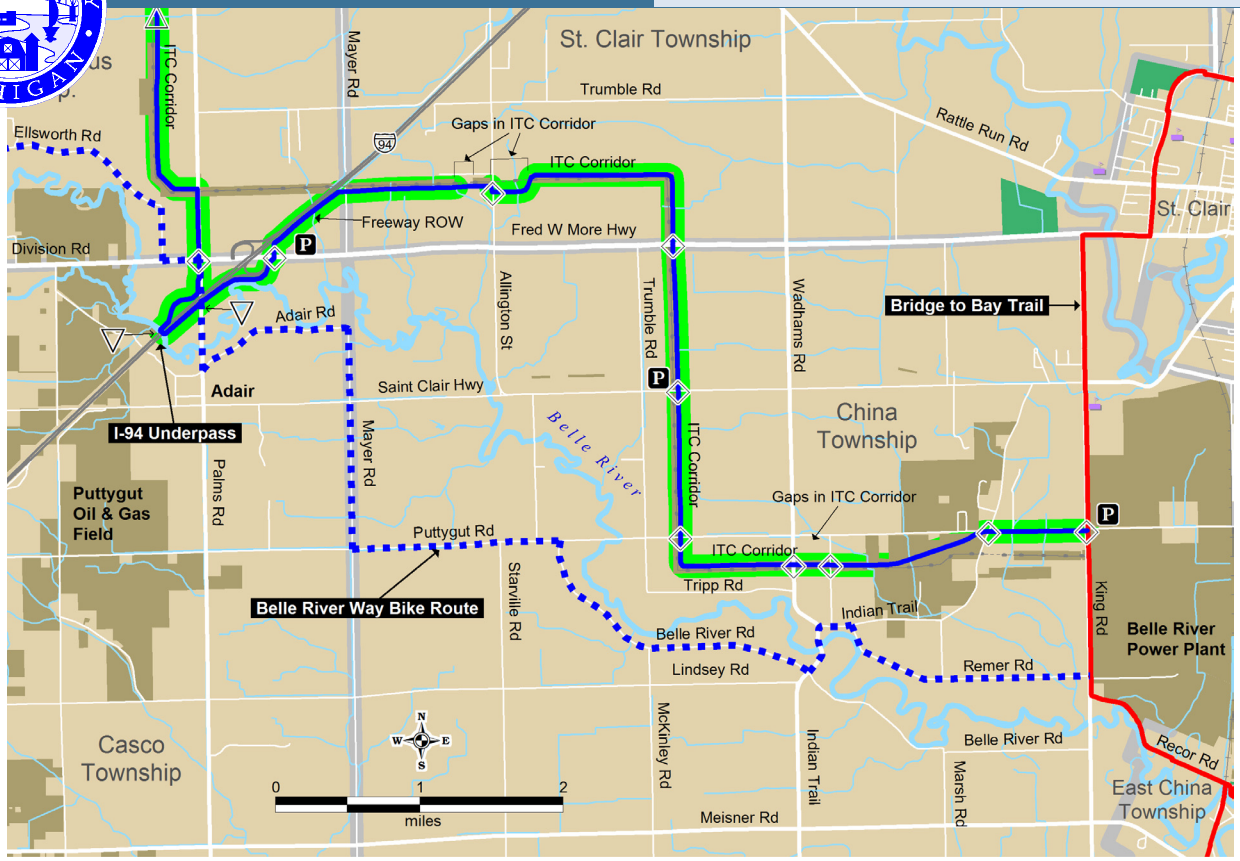
- Existing Off-Road Trail
- Existing On-Road Bike Route
- Proposed Off-Road Trail
- Proposed On-Road Bike Route
- Public Park
- Selected Large Private Properties
- Freeway
- Railroad
- Power Transmission Line - Owned
- Power Transmission Line - Easement
- Staging Area
- Interpretive Station
- At Grade Trail / Road Intersection
- Trail Bridge / Overpass
- Trail Underpass

Trail Feature Key:

- 16.8 miles of 10’ wide Shared Use Trail between Beebe Park and the I-94 Underpass
- Support facilities will be located about every four miles along the trail. These include facilities in Columbus Park along with facilities at two Staging Areas.
- 11 At-Grade Crossings of two lane roadways.
- 3 small bridges over creeks.
- A 2,800’ gap in ITC corridor ownership just south of Big Hand Road that requires a trail easement.
- Underpass of I-94 at the Belle River bridge.

East End of Power Line Trail

MOT/BTB Connectors



Legend:

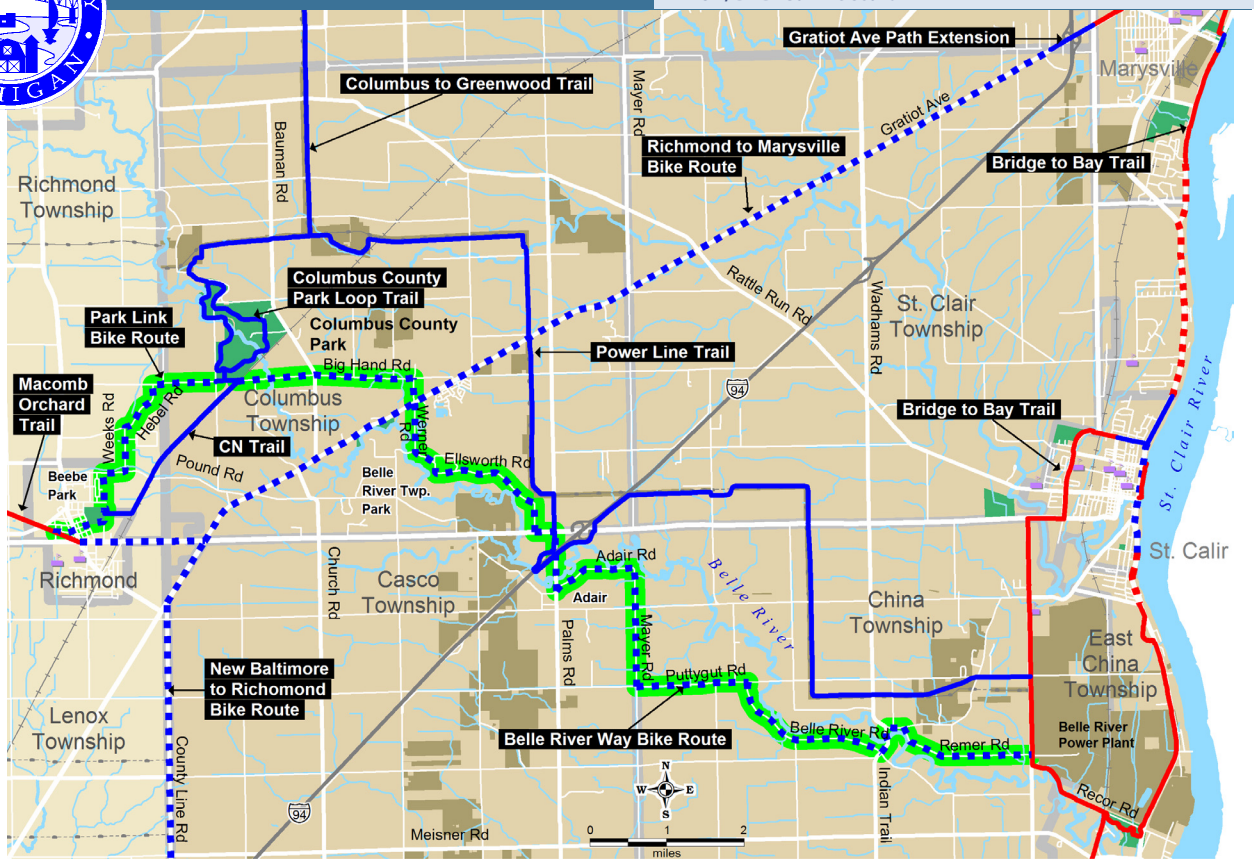
- Existing Off-Road Trail
- Existing On-Road Bike Route
- Proposed Off-Road Trail
- Proposed On-Road Bike Route
- Public Park
- Selected Large Private Properties
- Freeway
- Railroad
- Power Transmission Line - Owned
- Power Transmission Line - Easement
- Staging Area
- Interpretive Station
- At Grade Trail / Road Intersection
- Trail Bridge / Overpass
- Trail Underpass

Trail Feature Key:

- 9.6 Miles of 10’ wide Shared Use Trail between the I-94 Underpass and King Road.
- Support facilities at three Staging Areas will be located about every four miles along the trail.
- The Staging Area on Fred W. More Highway near I-94 will use the existing park-and-ride lot as peak trail use time are after work and during the weekends.
- Trail underpass of Palms Road at the Palms Road bridge over I-94 within the freeway ROW. This will be constructed similar to the many I-275/M-15 Bikeway underpasses.
- 660’ and 1400’ Gap in ITC Corridor Ownership either side of Allington Street.
- 9 At-Grade Road Crossings of two-lane roadways.

Park Link & Belle River Way "Back Roads" Bike Routes

MOT/BTB Connectors



Legend:

- Existing Off-Road Trail
- Existing On-Road Bike Route
- Proposed Off-Road Trail
- Proposed On-Road Bike Route
- Public Park
- Selected Large Private Properties
- Freeway
- Railroad

The Park Link and Belle River Way Bike Routes are highlighted in green.

Key Recommendations:

- An option to establish an immediate low cost link between the Macomb Orchard Trail and the Bridge to Bay Trail.
- Sign a "Back Roads" bike route using primarily scenic rural gravel roads that connect the Macomb Orchard Trail, Columbus County Park and the Bridge to Bay Trail
- The bike route crosses I-94 using the Palms Road overpass. This route can also serve as an alternate route to the proposed freeway underpass at the Belle River when it is flooded out or prior to its completion.

Park Link and Belle River Way "Back Roads" Bike Routes

The Park Link and Belle River Way "Back Roads" Bike Routes are the most expedient way to provide a link between the Macomb Orchard Trail and the Bridge to Bay Trail. This on-road route, even with the low traffic volumes, will not be appropriate for all bicyclists. But the route is a distance of 19 miles (approximately a 2 hour ride) and this will most likely be undertaken by older more experienced cyclists.

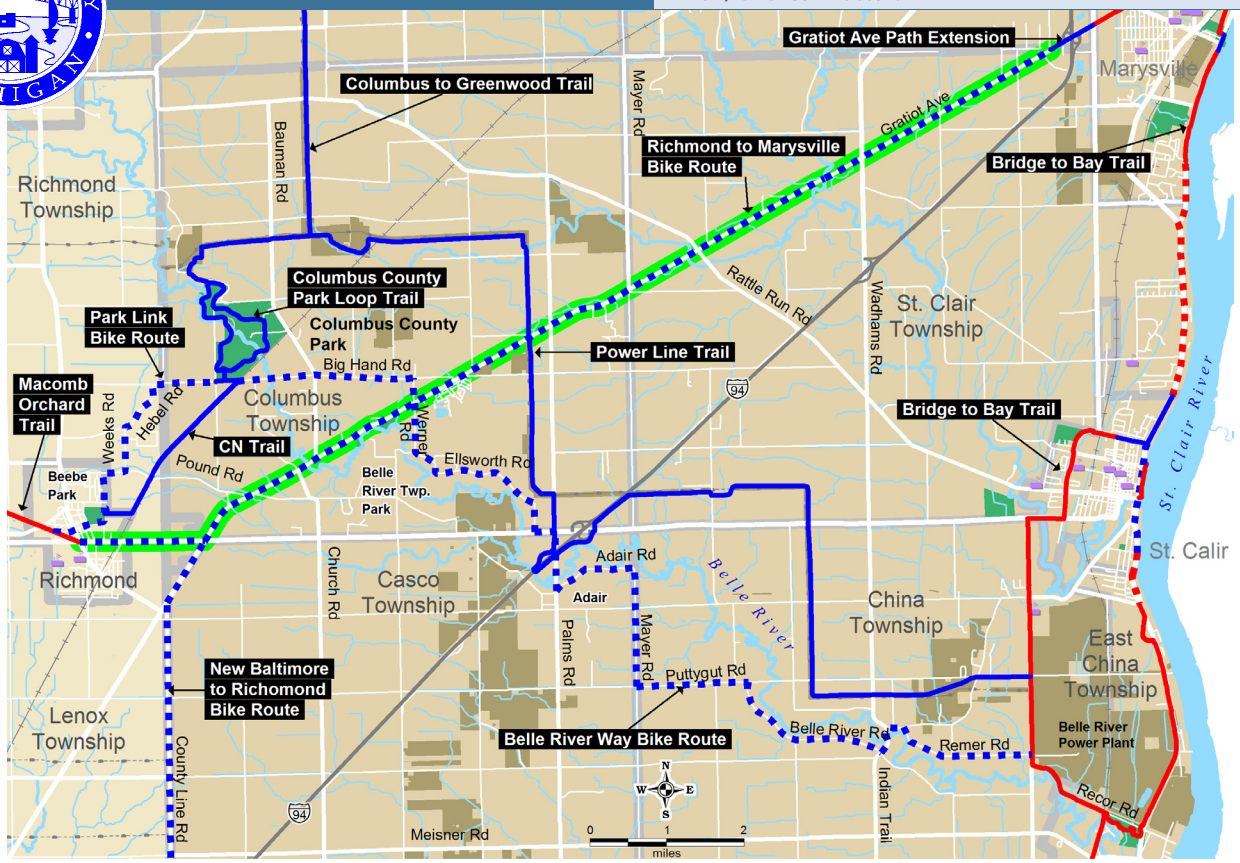
Gravel roads may be easily negotiated by mountain bikes or hybrid bikes and even a typical skinny tired road bike by an experienced cyclist. In order to make the roads more appropriate for bicycling though, the gravel roads should receive additional attention from the County Road Commission's grading crews. The additional grading of the roadways may help off-set any concerns residents along the roadway may have the roads being designated as a bicycle route.

While passing cars do kick up dust that can be an annoyance for bicyclists, the cars are few and far between. Also, bicycling down a gravel road is slower than bicycling on pavement. Many cyclists, when riding for recreation, gladly accept these inconveniences as an acceptable trade-off to being exposed to fewer cars and a more scenic route.

Cyclists currently enjoy using St. Clair Counties Scenic Back Roads.

Richmond to Marysville Bike Route

MOT/ BTB Connectors



Legend:

- Existing Off-Road Trail
- Existing On-Road Bike Route
- Proposed Off-Road Trail
- Proposed On-Road Bike Route
- Public Park
- Selected Large Private Properties
- Freeway
- Railroad

The Richmond to Marysville Bike Route is highlighted in green.

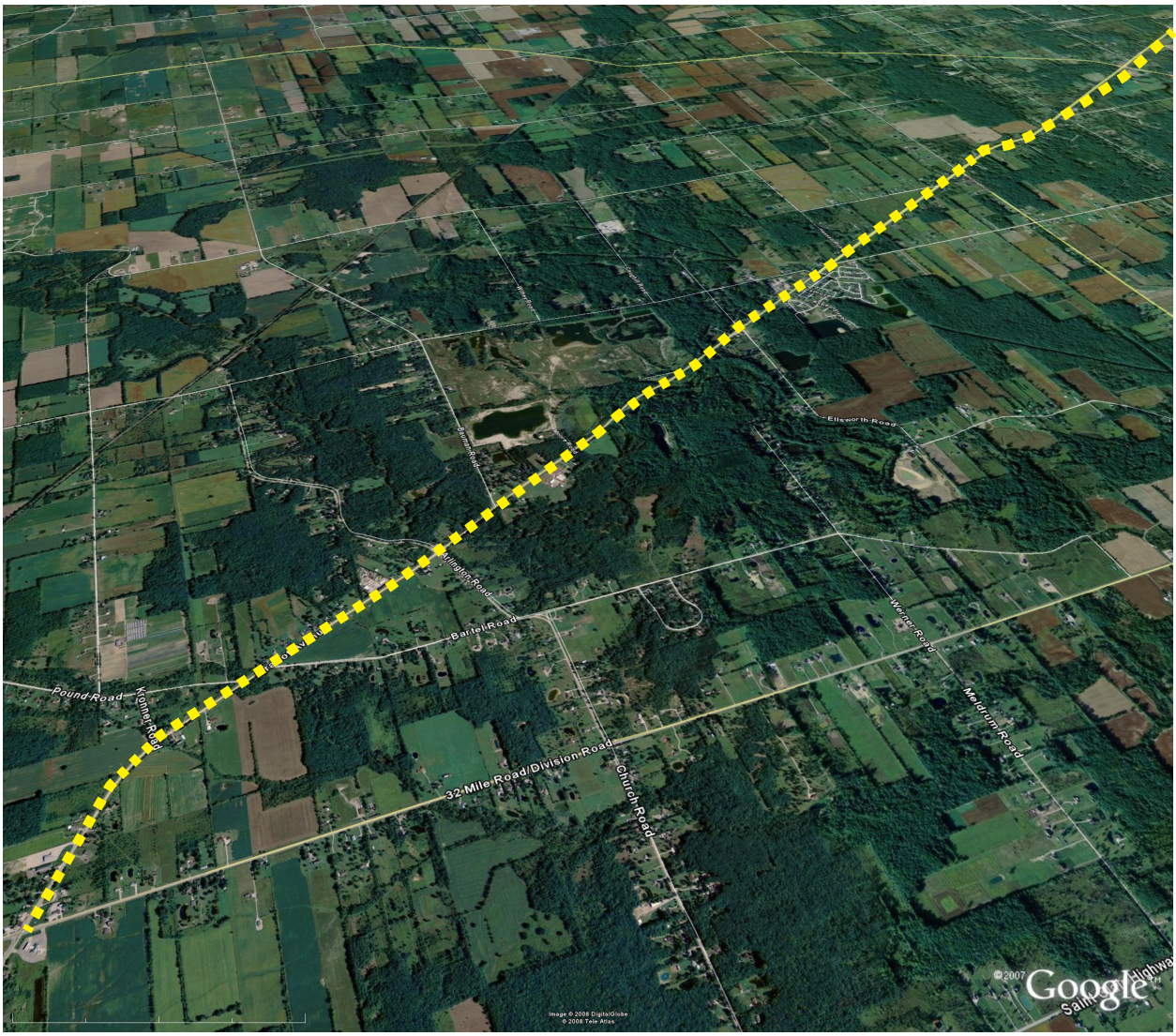
Key Recommendations:

1. Create a bike route between the Macomb Orchard Trail and the Bridge to Bay Trail.
2. As Gratiot Road is reconstructed add bike lanes.
3. Provide a link to the Columbus Township's Park on the Belle River.

Richmond to Marysville Bike Route

The Richmond to Marysville Bike Route would provide a link between the Macomb Orchard Trail's eastern terminus in Richmond and the Bridge to Bay trail in Marysville. It would mostly follow Gratiot Avenue through scenic rolling countryside which is a mix of forest, fallow fields and active agriculture.

Gratiot Avenue between Richmond and Marysville is a high speed roadway but with low volumes of vehicles. Providing a minimum of a 4' wide paved shoulder would make this road and important non-motorized link in the county. Currently the road is being reconstructed from the northeast to the southwest. Paved shoulders may be economically incorporated into the reconstruction project. The paved shoulders also provide numerous benefits to motorist's safety and the longevity of the pavement. Given the low volumes of traffic, the motorized vehicle lanes may be narrowed to 11' to provide even more room for a paved shoulder.



Gratiot Avenue, stretching from the lower left hand corner to the upper right hand corner of the photo traverses a varied and scenic portion of the county.

Secondary Connectors

Northern Connectors

Central Connectors

Southern Connectors

Northern Connectors Overview

Secondary Connectors

Northern Connectors

Lake Huron Bike Route

The Lake Huron Bike Route only needs a few minor improvements to make it suitable to sign as a Bike Route. From the northern terminus of the Bridge to Bay Trail near the Blue Water Bridge to Holland Avenue the route winds through a scenic neighborhood boarding Lake Huron and provides occasional views of the lake. No additional facilities beyond signs are necessary.

From Holland Avenue to Kraft Road the route follows Lakeshore Road which is a three lane road with moderate traffic. A study should be done to determine if the continuous shared left-turn lane may be eliminated and bike lanes added for most of the strength. The bike lanes may be dropped and designated left-turn lanes may be added where warranted.

From Kraft Road to Carrigan Road the route follows Lakeshore Road where it is a two lane residential road with low traffic volumes and low speeds. In this segment no additional facilities beyond signs are necessary.

From Carrigan Road to the County line the route follows Lakeshore Road where it joins with M-25 and is a high speed and high volume roadway. This segment of the route already has a wide paved shoulder suitable for bicycling. The only improvements necessary are to place a pocket bike lane at the locations where there is a designated right turn lane. This will eliminate a dangerous situation where bicyclists are directed to the right of right turning vehicles.

Fort Gratiot Trail Extensions

Burtchville Township and Fort Gratiot Townships have constructed trails that they plan to extend and link into the Bridge to Bay Trail. This would provide an off-road alternative to the Lake Huron Bike Route. It would also create the opportunity for a loop route using both the Lake Huron Bike Route and the Bridge to Bay Trail Extension. The proposed trails routes are preliminary and some would require obtaining easements from private land holders.

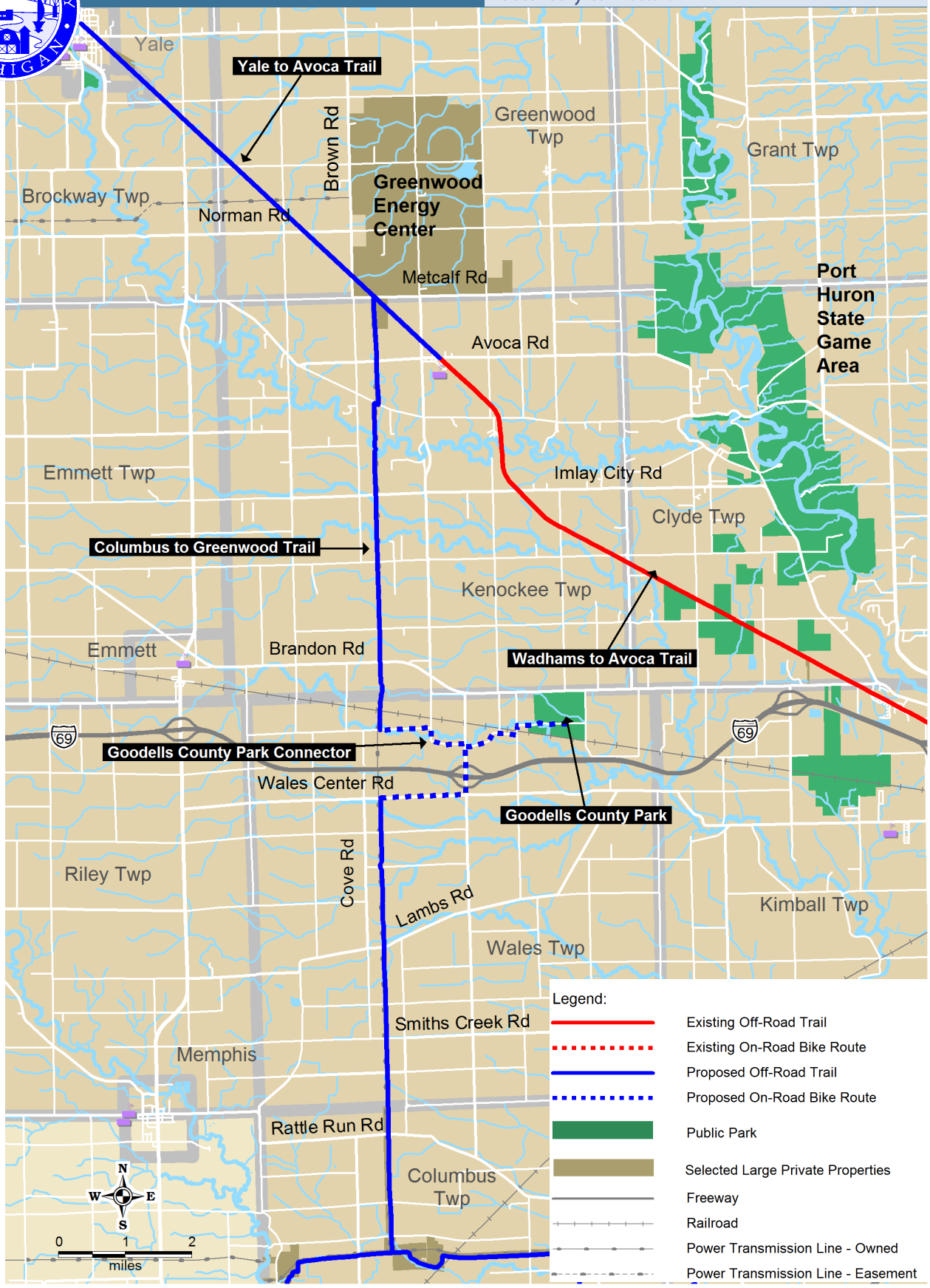
River Road Bike Route

The County Road Commission is planning on replacing the Wadhams Road bridge over the Black River and including a pathway on the east side of the new bridge. There are also preliminary plans to link the bridge path to the Wadhams to Avoca Trail. When the bridge is complete this will provide an alternative route from the Wadhams to Avoca Trail to the north part of Port Huron and the Fort Gratiot Township Trail system. North River Road from Wadhams Road to North Road has a paved shoulder. From North Road to State Road North River Road it is a two-lane road about 26’ wide. From State Road to Pine Grove, North River Road is a four lane road with carrying about 12,000 vehicles per day. This segment would be an ideal candidate for a four to three lane conversion that provides bicycle lanes.

Constructing a short segment of Side Path along the west side of Pine Grove would link the River Road Bike Route up with a proposed Shared Use Path along the flood control canal leading out to Lake Huron. A Shared Use Path is also proposed to link the Path along the flood control canal to the Fort Gratiot Trail system.

Central Connectors Overview

Secondary Connectors



Central Connectors

Yale to Avoca Trail

If the segment of rail line between Avoca and Yale becomes abandoned the Wadhams and Avoca Trail should be extended to Yale. This will reconnect the communities of Yale, Avoca, Wadhams and Port Huron with a non-motorized trail. This route will also tie into the Columbus to Greenwood Trail.

Columbus to Greenwood Trail and Goodells County Park Connector Bike Route

The Columbus to Greenwood Trail and the Goodells County Park Connector link the Power Line Trail just north of Columbus County Park, Goodells County Park and the Wadhams to Avoca Trail extension. The Columbus to Greenwood Trail would be located in an ITC high voltage transmission corridor. The Goodells County Park Connector would be an on-road bike route that would go over I-69 and link up to the County Park.

The Central Connectors in conjunction with the Wadhams to Avoca Trail, Rails to River Trail, Bridge to Bay Trail and Power Line Trail will create an approximately 64 mile primarily off-road loop through the county. This loop will connect and incorporate three of the four major facilities of the St. Clair County Park and Recreation Commission. It's length, varied natural and cultural elements, and loop form lends itself to major events such as metric century rides and could become a regional draw for bicyclists.

Southern Connectors Overview

Secondary Connectors

Legend:

- Existing Off-Road Trail
- Existing On-Road Bike Route
- Proposed Off-Road Trail
- Proposed On-Road Bike Route
- Public Park
- Selected Large Private Properties
- Freeway
- Railroad

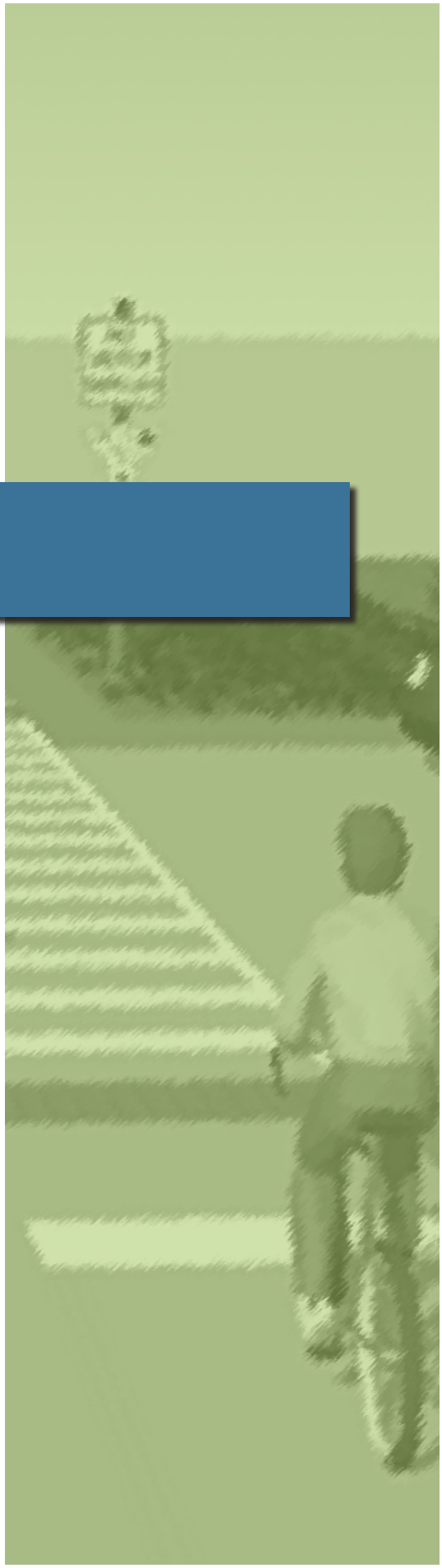
Harsens Island Bike Route

1. Sign a bike route through Harsens Island.
2. Provide signs along the New Baltimore to Algonac Bike Route indicating that a bicycle may be taken on the ferry to additional bike routes on Harsens Island.

New Baltimore to Algonac Bike Route

1. Sign a bike route on Dixie Highway.
2. Place pocket bike lanes at locations where there are a designated right turn lanes.

Design Guidelines



Trail Types

Surfacing Alternatives

Trail/ Road Intersections

Signage and Wayfinding

Site Elements

Design Guidelines

The following design guidelines provide direction on how the various elements proposed in the previous section should be implemented.

Trail Types

- Shared Use Trails
- Separated Use Trail
- Rail Trail
- Rail with Trail
- Wooded Utility Corridor
- Agricultural Utility Corridor
- Bike Lanes and Sidewalks

Trail Surfacing

- Crushed Fines
- Asphalt
- Recycled Asphalt
- ResinPave bound Fines
- Stabilized Crushed Stone

Trail/ Road Intersections

- Urban and Rural Crossings
- Passively Activated Crosswalk Warning System
- Mid-block Crosswalk with Crossing Island
- Unsignalized Mid-block Zig-zag Crosswalk
- Ladder Style Crosswalk
- Hybrid Pedestrian Signal

Signs and Wayfinding

- Trail Crossing Signs
- Staging Area Entrance Signs
- Trail Kiosk
- Interpretive Sign
- Bike Route Sign

Trail Amenities

- Bridge Railing
- Prefabricated Vault Toilet Building
- Site Furnishings

Trail Types

Trails are non-motorized facilities that for the most part, are independent from roadways. The following pages provide guidelines on two general types of trails as well as specific applications where either of those trail types may be applied.

GENERAL OFF-ROAD TRAIL TYPES

There are two general categories of off-road trails in the action plan:

- **Shared Use Trail** – comprised of a single surface a minimum of 10' wide that is shared by bicyclists and pedestrians as well as a variety of other non-motorized users. A variety of trail surfaces are used with crushed fine aggregate and asphalt being the most common. The type of trail surface influences what types of uses may take place on the trail.
- **Separated Use Trail** – the trail is comprised of two separate but adjacent trails, one for bicyclists and one for pedestrians. These trails are used in more urban areas where the number of users increases the potential for conflicts between user groups. Typically, asphalt is used for the bicycle path and concrete is used for the pedestrian path.

SPECIFIC OFF-ROAD TRAIL TYPES

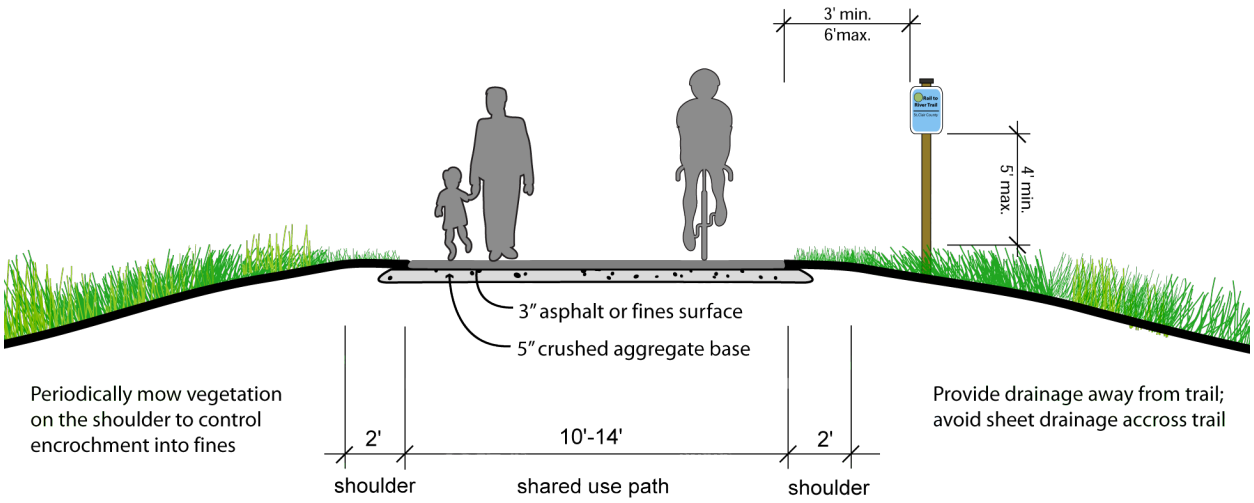
There are three specific situations, each of which has its own unique design considerations.

- **Rail Trail** – built on a grade of an abandoned railroad. Generally these are Shared Use Trails as the width of a single track railroad grade is only wide enough to accommodate one 10' wide trail.
- **Rail with Trail** – are constructed adjacent to an active railroad line. These may be built on an easement within the railroad ROW or on property immediately adjacent to the railroad. The trail may be separated from the railroad by a fence where the trail is in close proximity to the railroad.
- **High-Voltage Transmission Corridor** - are constructed within a a corridor that is typically owned by a transmission company. In most cases, the trail is placed to the side of the corridor, not under the power lines themselves.

ON-ROAD ROUTES

In some cases it is not possible or desirable to have a trail separate from the roadway.

- **Bike Lanes and Sidewalks** – A bike lane is a traffic lane in the roadway designated for the exclusive use of bicycles. Bike lanes are distinguished by pavement markings and signs and are typically found in urban and suburban settings. Bike lanes are typically paired with sidewalks.
- **Paved Shoulder** – are the paved area outside of the solid white "fog" line on rural roads. In order to be usable for bicyclists they need to be at least 4' wide and significantly wider on high speed routes with considerable traffic and truck volumes. They typically do not have any bicycle specific pavement markings or signs and are used by both pedestrians and bicyclists.
- **Bike Route** – is not tied to any specific facility type, rather it is a wayfinding aid. Bike Route signs direct bicyclists to destinations along routes that are suitable for bicycling. These routes may include bike lanes, paved shoulders or low traffic volume roads where bicyclists and motorists can comfortably and safely share the roadway.



Example

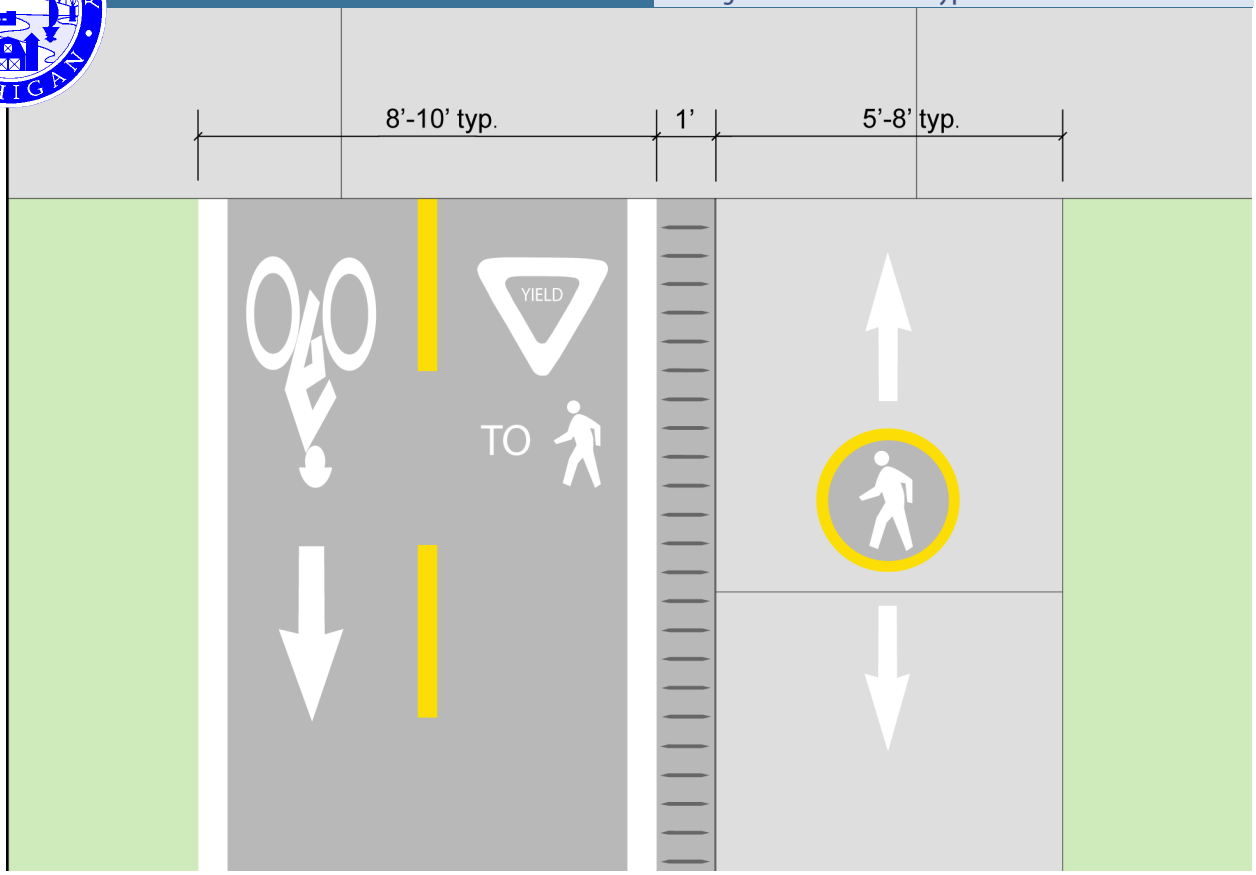
Lansing River Trail, Lansing, MI

Key Recommendations:

- 10’ to 14’ shared us path with a minimum of a 2’ shoulder on either side of the trail.
- A number of surfacing options are suitable for a shared use path such as asphalt, recycled asphalt, or fines. See “Surfacing Alternatives” for details on options.
- No matter which surface option is used, a solid base capable of supporting maintenance vehicles in all seasons is critical.
- The trail needs to be crowned with positive drainage away from the trail. Water should never be directed across a trail.
- All obstructions should be kept at least 2’ away from the edge of the trail.

Seperated Use Trail

Design Guidelines- Trail Types



Example

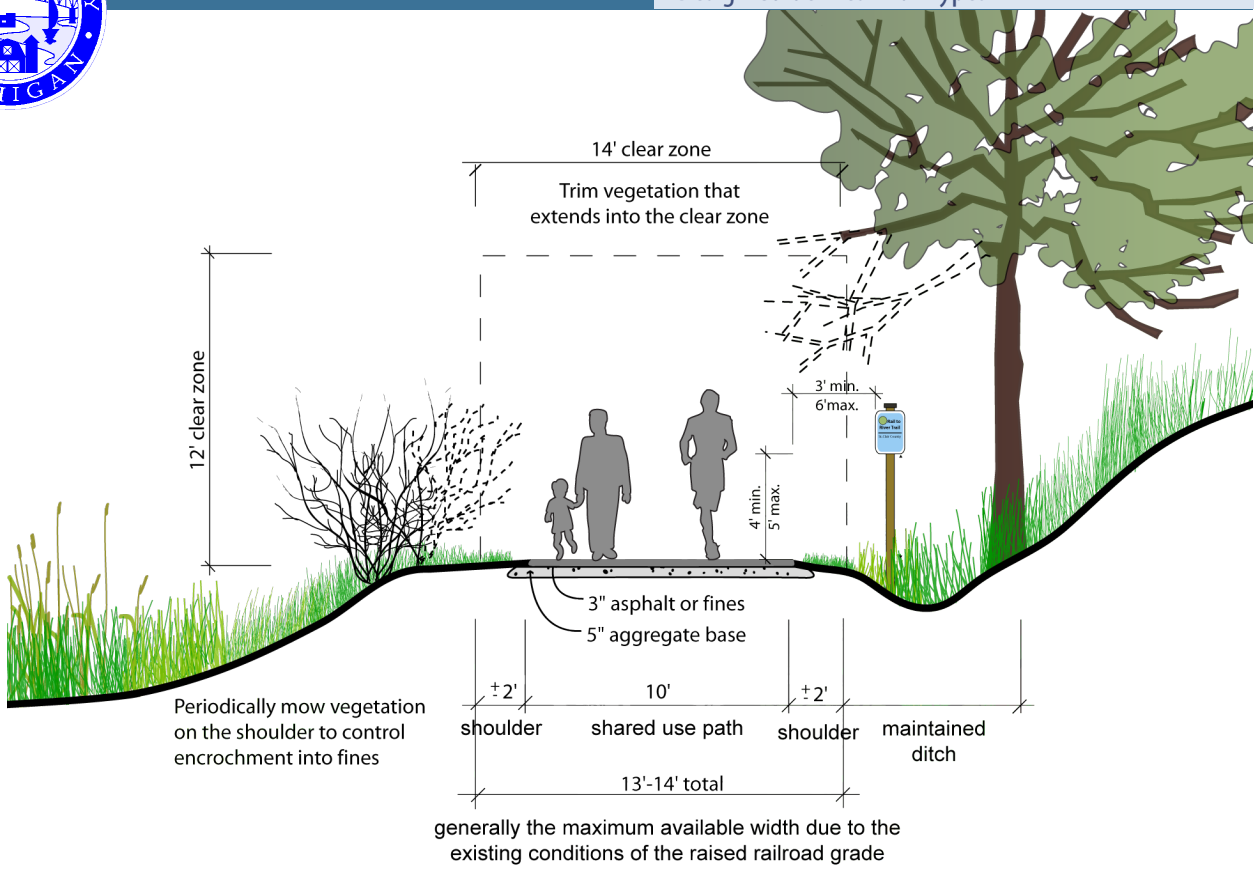
Cambridge, MA

Madison, WI

Key Recommendations:

- A separated use trail is ideal when there is significant use by both bicycles and pedestrians. Providing a lane specific to walkers or joggers minimizes conflicts with cyclists moving at much faster speeds.
- Ideally, the bicycle path is separated from the pedestrian path where room allows (as shown in the example from Madison, WI).
- Where the two trails are adjacent it is important to use contrasting pavement markings, tactile detection strips and/or a change in surface material help to distinguish the pedestrian only lane from the bike path (as shown in the Cambridge, MA example and the design guidelines).
- The pedestrian path can be phased in after the initial path construction.
- If the pedestrian path will be used by runners, a crushed aggregate surface may be desirable.

Design Guidelines- Trail Types

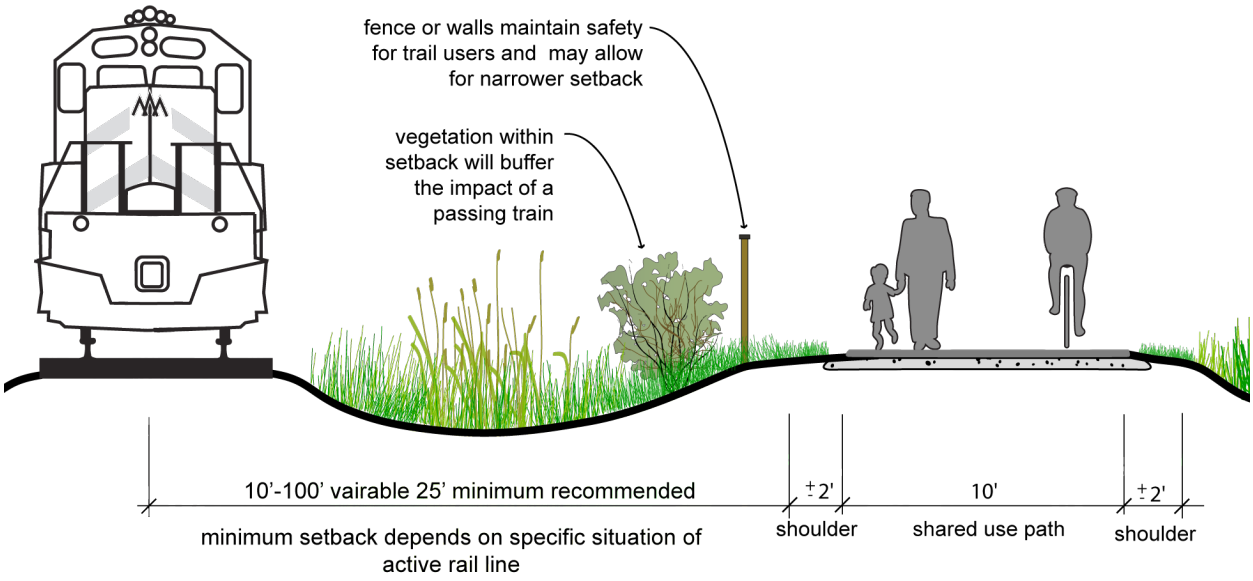


Example

Clinton River Trail, Rochester, MI

Key Recommendations:

- Due to the existing conditions of the railroad grade, 13'-14- is generally the maximum width available, which allows for a 10' shared use path with 2' of shoulder.
- Oftentimes it may be necessary to remove the top portion of a railroad grade in order to achieve an appropriate width for a trail and shoulder.
- Maintain a 12' high by 14' wide clear zone free of vegetation.



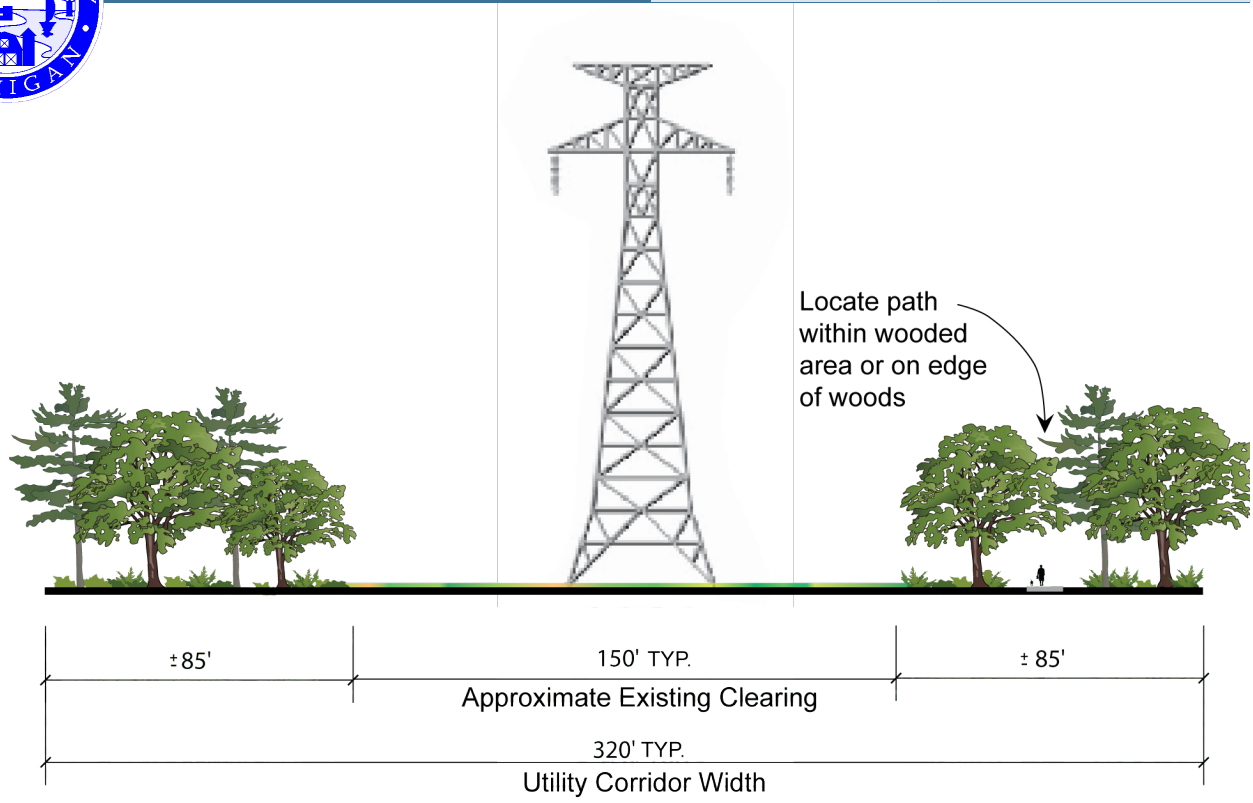
Example

Celina, OH. From www.washcycle.com

Key Recommendations:

- The 10' to 100' potential setback distance from an active rail line responds to the specific situation of the rail line (i.e. type, speed and frequency of trains, right-of-way width, level of separation, sight lines and topography).
- A minimum of 25' setback with a fence is recommended.
- Vegetation planted within the setback zone provides an additional level of security and buffers the impact of a passing train.
- For further information see U.S. DOT Federal Highway Administration. 2002 "Rails-with-Trails: Lessons Learned, Literature Review, Current Practices, Conclusions" www.fhwa.dot.gov/environment.rectrails.rwt.

HIgh-Voltage Transmission Corridor- Wooded

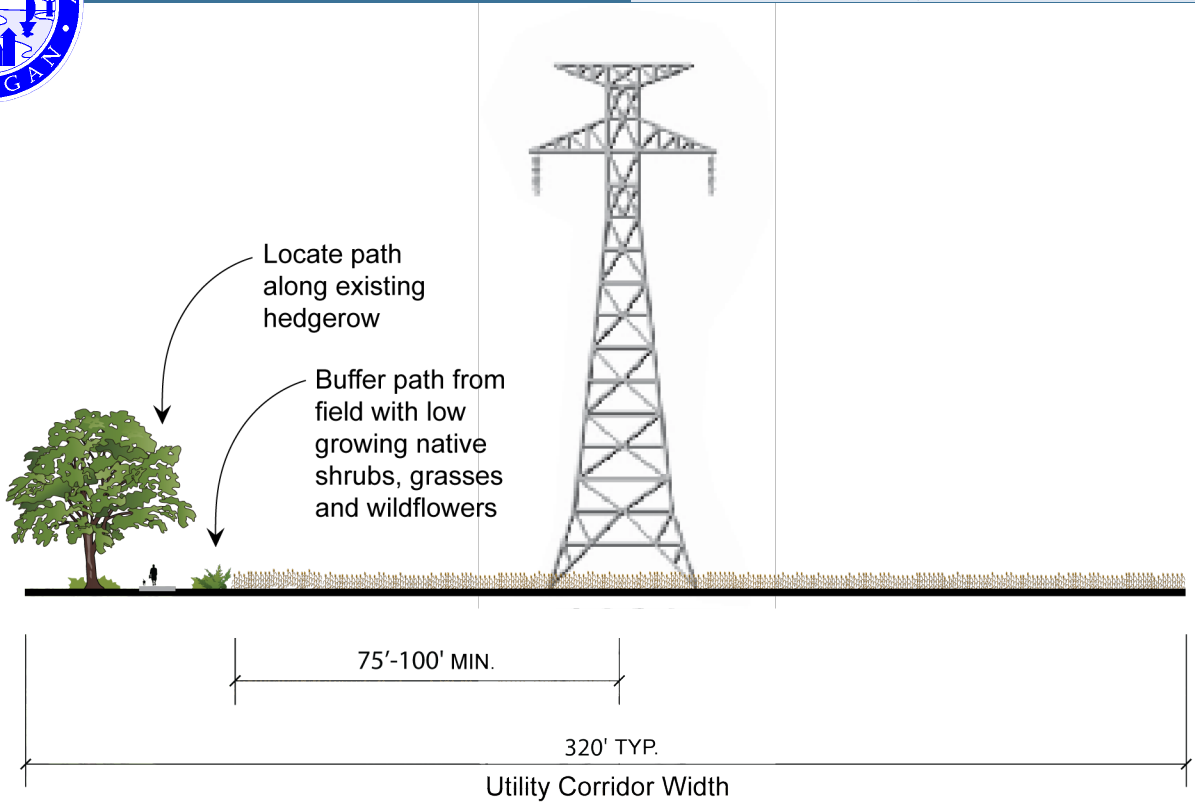


Example

West Bloomfield Trail, West BloomField, MI.

KEY RECOMMENDATIONS:

- The typical width of a wooded ITC corridor in St. Clair County is 320’ wide with a 150’ clearing for the towers and transmission lines. This type corridor provides 85’ of forested area on either side for a scenic trail experience.
- Through the wooded corridors, locate the trail outside of the 150’ cleared area nestled within or alongside the woods.

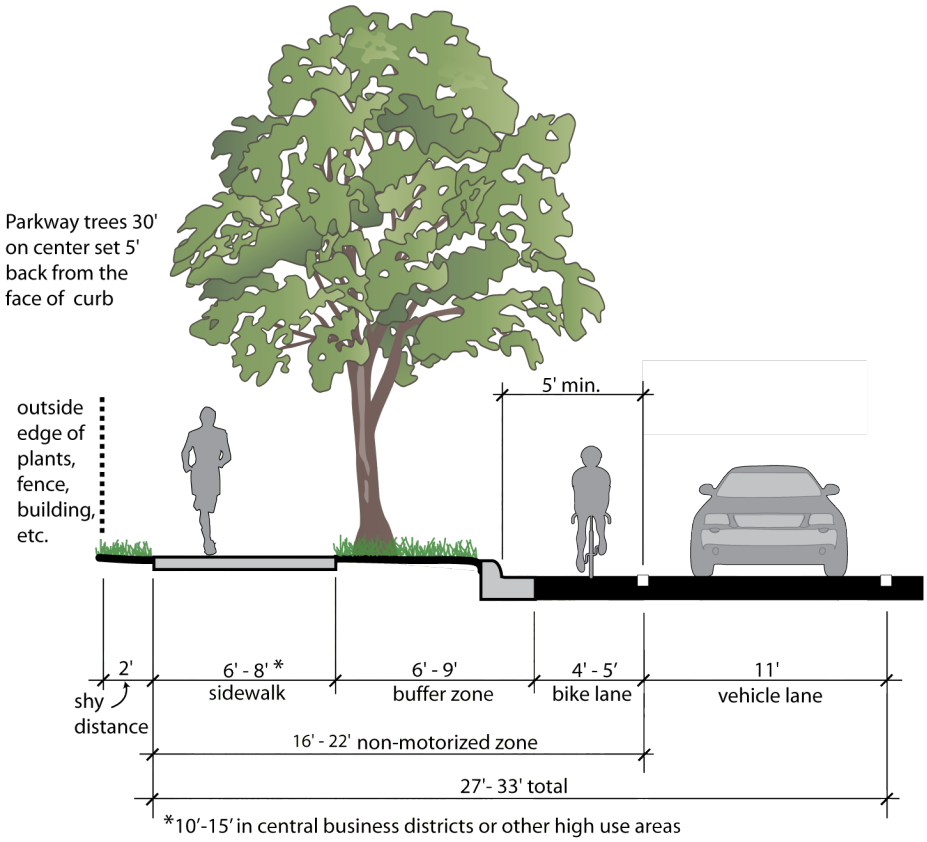


Example

A Transmission Corridor in St. Clair County

Key Recommendations:

- The typical width of an agricultural ITC corridor in St. Clair County is 320' wide allowing for a 75' to 100' setback from the transmission tower to the edge of the trail.
- Through the agricultural corridors, locate the trail alongside of an existing hedgerow and buffer the path from the agricultural field with low growing native shrubs, grasses and wildflowers.
- In St. Clair County many of the ITC corridors run through fallow fields. In other cases, they run through actively planted fields in which case special arrangements would need to be made.



Example

Packard Street, Ann Arbor, MI

Key Recommendations:

- A striped bicycle lane or designated paved shoulders within the roadway is the safest place for a cyclist to ride.
- Traffic volumes and speed should determine whether to use a 4' or 5' wide bike lane. A 5' bike lane is preferred when volumes are over 25,000 trips per day and/or speeds are posted a 40 MPH or above.
- Some cyclists may choose to ride on the sidewalk based upon their comfort level.
- A planted buffer zone between the street and the sidewalk provides a safer and more comfortable pedestrian experience.
- Trees should be planted 5' back from the face of curb and 2' back from the edge of the sidewalk.

Trail and Route Overview

Of all of the elements of the trail, the surface has the most profound impact on the ultimate use of the trail. A crushed fines surface slows bicycle speeds and eliminates inline skaters. Asphalt pavement is an ideal surface for bicycling and inline skating.

Another option for trail surfacing is the use of a plant-based aggregate binder. Resin or powder-based binders are increasingly being used as environmentally friendly compromises for trail construction. The plant-based binders are relatively new technologies. A variety of companies have competing products. Although the surface of the plant-based fines is smoother than loose fines, it is not an appropriate surface for inline skating.

Recently, in Rochester Hills, a portion of the Clinton River Trail was paved in recycled asphalt. This resulted in significant cost savings for paving the trail. This was possible because roads near the trail where be rebuilt and significant volumes of asphalt where being removed. The key to using recycled asphalt is grinding the asphalt to an appropriate mixture. If large pieces of asphalt remain, the surface will be unsatisfactory.

Crushed Fines

SUGGESTED USES:

KEY POINTS:

- 3” to 4” of limestone or slag fines (3/8” down to dust) material is placed on a 5” to 6” aggregate base
- Low initial cost but requires frequent maintenance to control erosion and vegetation encroachment
- Coarser aggregate base may be exposed on the surface with erosion and unusual wear requiring expensive rehabilitation every 10 to 15 years
- Works well with walkers, runners and horses
- Slower speeds for bikes and makes approaching bicycles more audible to walkers
- Dust from fines can be a maintenance problem for bicycles
- Limestone fines are dustier and take longer to set-up than slag fines

Asphalt

SUGGESTED USES:

KEY POINTS:

- About 3” to 4” of asphalt is placed in two lifts over a 5” to 6” aggregate base
- Moderate initial cost- somewhat difficult to repair satisfactorily
- Moderately long life – can be expanded with surface and crack sealants
- Excellent surface for bicyclists and in-line skaters
- Faster speeds for bikers can be problematic for other users
- Dark color leads to pavement heat retention- snow is more likely to melt on asphalt making it a unsuitable surface for cross-country skiing
- Asphalt can be plowed in the winter
- Works well with pavement markings
- Familiar construction techniques
- Issues with run-off pollution especially when first applied

Recycled Asphalt

SUGGESTED USES:

KEY POINTS:

- Salvaged asphalt is ground through cold milling to ¾” inch or less aggregate material
- Using an asphalt paving machine, a 4” layer of recycled asphalt is laid onto compacted existing railroad bed
- Does not preclude futures surfacing improvements such as asphalt overlay
- There can be significant cost savings over using virgin materials, especially if there is a local road replacement project.
- Works well with walkers, runners and horses
- Similar functions surface to a crushed fines but without the erosion, dust or spring sogginess issues
- Relatively quick implementation, the surface does not require a curing period and can be rolled, striped and opened to trail users.

ResinPave Bound Fines

SUGGESTED USES:

KEY POINTS:

- 2” to 4” of fine aggregate (3/8” down to dust) bound by a plant based emulsion on a 5” to 6” aggregate base
- Construction techniques use standard equipment: the emulsion mixtures are applied cold but installed like hot mix asphalt pavement mixtures with paving machines and steel drum rollers
- Does not affect the color of the aggregate – light colored aggregate reduces the heat retaining properties of pavement
- The plant-based resin binder has a similar strength and performance to asphalt
- Relatively easy to repair without specialized equipment
- Considered a “green” building material – very low run-off problems
- Approximately twice the cost of asphalt for the emulsion form

Stabilized Crushed Stone Surface

SUGGESTED USES:

KEY POINTS:

- Non-toxic organic, colorless and odorless plant-based powder serves as a binding agent
- 3” of fine aggregate (3/8” down to dust) stabilized by the powder binder over 5” to 6” aggregate base course
- For best results aggregate fines and powder are mechanically mixed off-site, placed dry, then hydrated in place
- Surface takes 2 days to a week to set depending on weather conditions.
- When set the surface is rigid semi-porous surface
- Prolonged saturation will result in a pliable surface prone to rutting
- Very easy to repair without specialized equipment- mixing on spot for patch jobs
- Considered a “green” building material – very low run-off problems
- Approximately the same cost as asphalt
- The powder-based binder creates a surface inappropriate for inline skating

Trail/ Road Intersections

Trail Surfacing

The trails in St. Clair County intersect roadways, of which, most of these crossings are at unsignalized mid-block locations. Motorists are typically not expecting the presence of mid-block crosswalks, therefore, important safety standards must be incorporated into the design of these intersections. To be effective and safe, the trail/ road intersection should be designed to:

- Alert motorists and trail users to the approaching intersection
- Provide clear guidance on the rules-of-the-road
- Allow clear visibility between motorists and trail users
- Minimize crossing distances
- Provide accessible solutions

Alert motorist and trail users to the approaching intersection

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

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

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

Provide clear Guidance on the Rules-of-the-Road

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

As an alternative, the “Yield to Pedestrians Here” sign, R1-5, shown at the right is recommended in conjunction with a yield bar. This combination clearly indicates to motorists the need to yield to pedestrians in the crosswalk and the optimum location at which to stop to maximize visibility between crosswalk and roadway users.

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

Allow Clear Visibility between Motorists and Trail Users

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

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

Minimize Crossing Distances

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

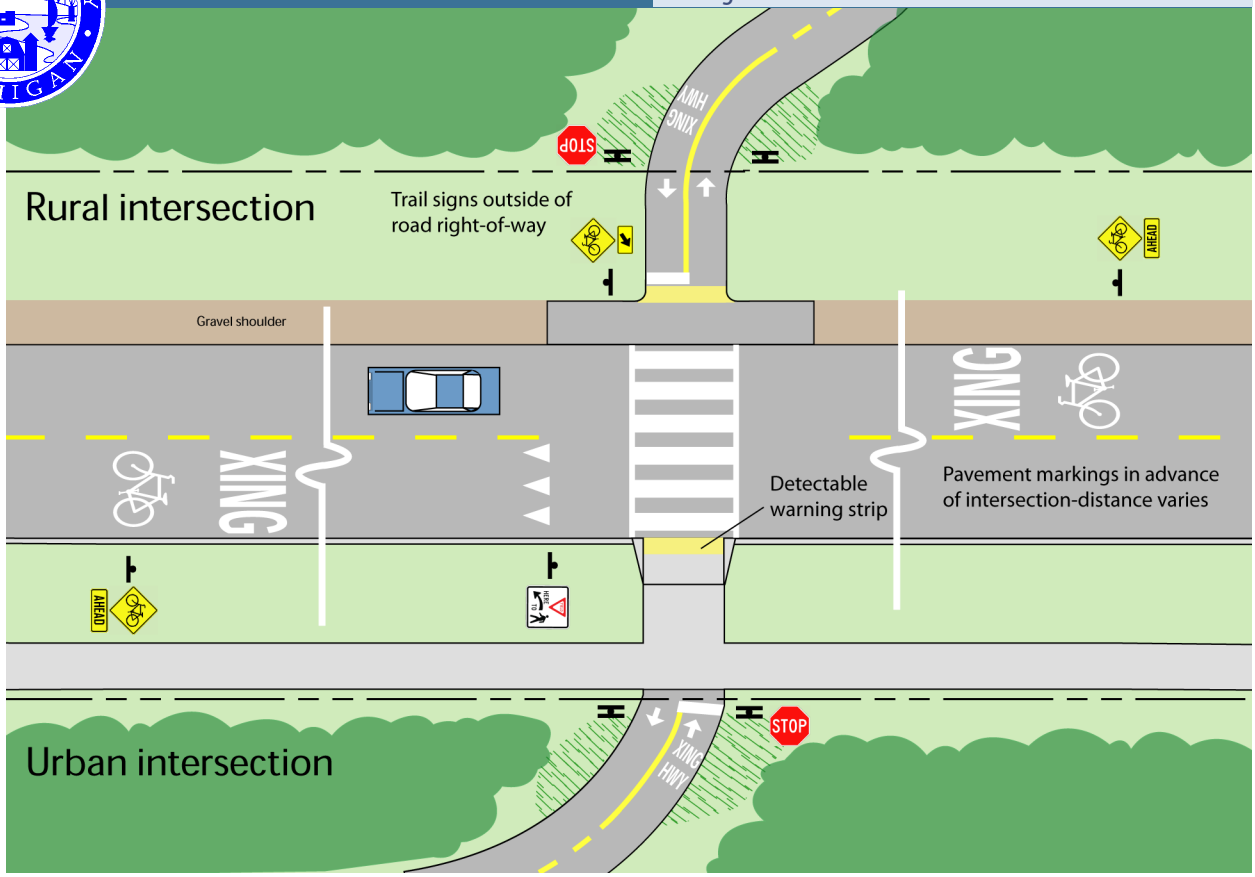
Refuge islands allow the pedestrian to undertake the crossing in two separate stages. This increases their comfort level and opens up many more opportunities to safely cross the road. Refuge islands also have the benefit of reducing vehicle delay because more users can cross at gaps. Refuge islands should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

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

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

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

In the following pages, the key points for the safe design of a road/ trail intersection are illustrated and discussed in more detail. See the AASHTO Guide for the Development of Bicycle Facilities, pages 46-51, for a detailed discussion of shared-use path intersection design guidelines.



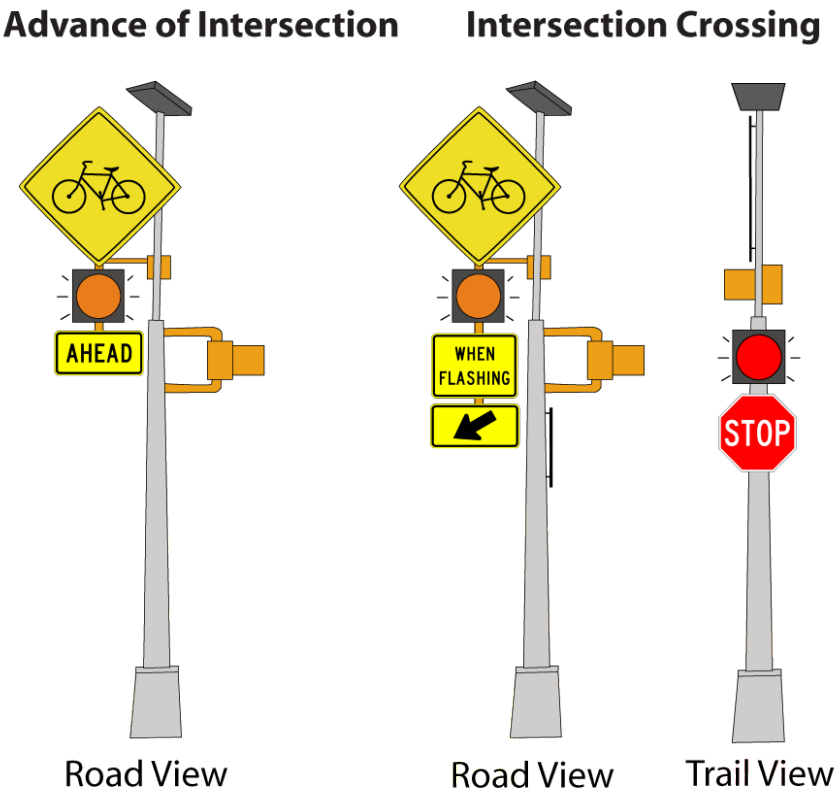
Description:

Independent pathways often intersect roadways at unsignalized mid-block crossings. Many of the design guidelines for a typical mid-block crosswalk apply but because of the unique nature of independent pathways, several additional safety points must be considered.

The Clinton River Trail at transitions from an aggregate surface to an asphalt surface as it approaches Adams Road and curves to bring the pathway 90 degrees to the road at the crosswalk.

Key Elements:

- 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 of users.
- Trail signage that is not mounted on standard breakaway posts is often 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 in both urban and rural applications. The hard surface increases traction for cyclists, notifies and users of the upcoming intersection and cuts down on debris from the shoulder.



Description:

A flashing beacon and/or in-pavement flashing LED's are activated when a pedestrian is present. The signals may be passively activated through a number of methods or activated via a standard push button. The pedestrian approach can also be set to flash a red light with a sign indicating to cross after traffic clears. Various manufacturers have solar powered models with radio controls to activate flashers on advance warning signs and on signs on the opposite side of the street. This significantly reduces the cost of installation and operation.

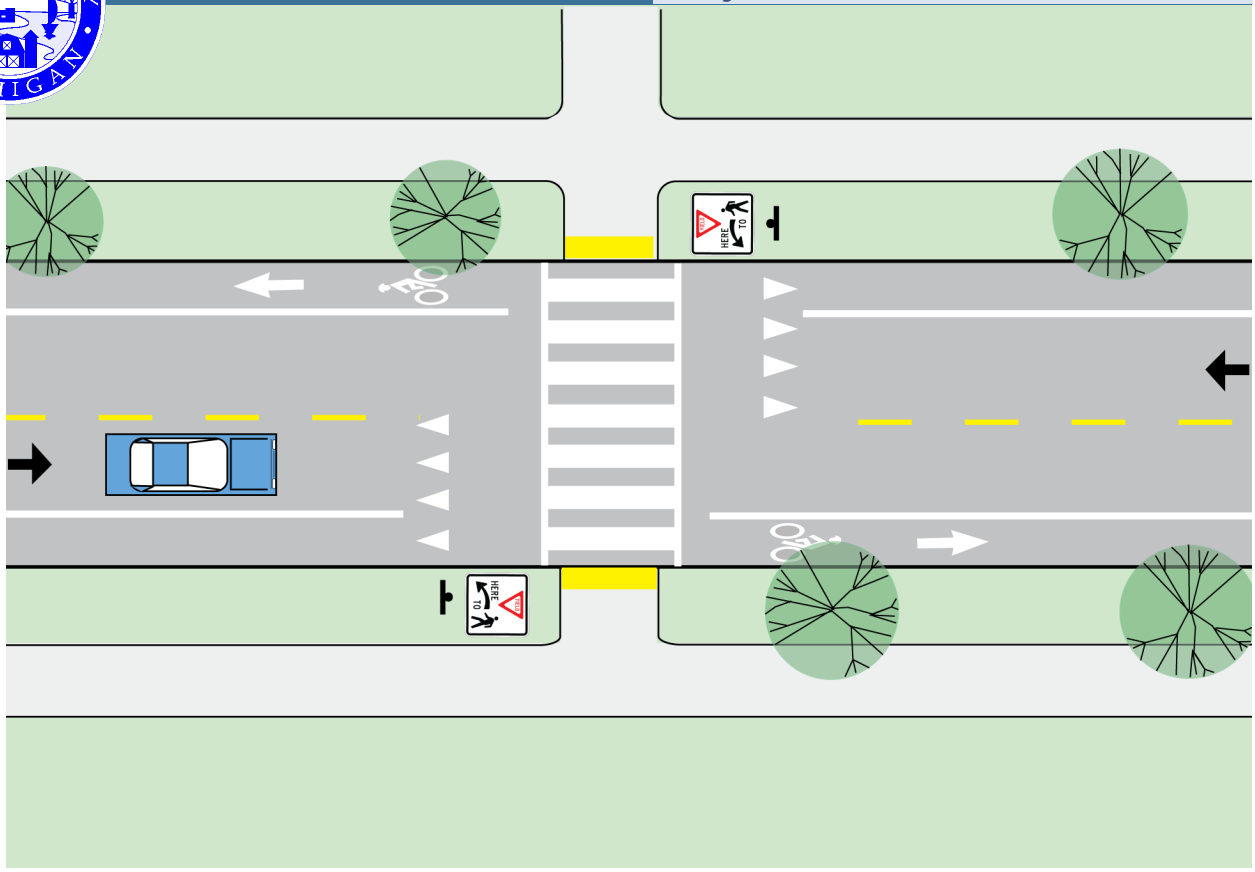
Recently, FHWA issued a memorandum of Interim Approval for the optional use of Rectangular Rapid Flashing Beacons (RRFB) as a warning beacon under certain limited conditions. This new system has been found to be more effective than standard side-mounted round beacons. More information may be found at http://mutcd.fhwa.dot.gov/resources/interim_approval/ia11/stpetersburgrpt/index.htm.

Applications

These systems are best located at pathway and major road intersections, or mid-block crosswalks on major roadways where pedestrian traffic is sporadic. Passive activation works best when there is a long pedestrian approach such as pathway.

Rectangular-shared Rapid Flash LED Beacon Example

Unsignalized Basic Mid-block Crosswalk



Description:

A mid-block crosswalk for a two-lane road at an unsignalized location 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 crossing signs other than the R1-5/ R1-5a "Yield Here to Pedestrians" are used, yield lines should be omitted.
- Sightlines are kept clear of vegetation.
- A 2' wide detectable warning strip is used at the base of the ramps.

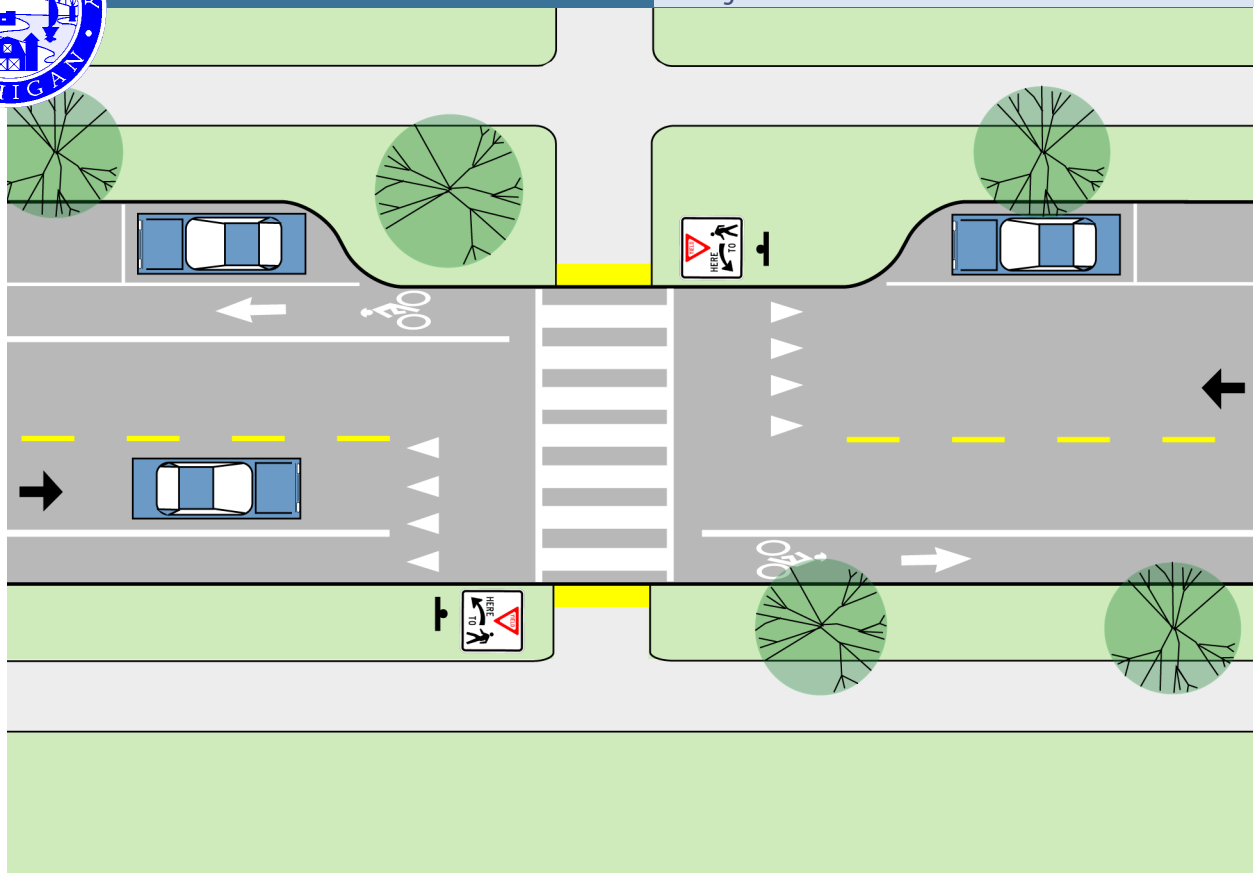
Applications

Generally used on relatively low volume, low speed roads where sufficient gaps in the motorized traffic exist. This crosswalk design should not be used in any situations where there are greater than two travel lanes or when there is on street parking.

Example

North Shaw Lane, Michigan State University, East Lansing, Michigan.

Unsignalized Mid-block Crosswalk with Parking



Description:

A mid-block crosswalk for a two-lane road at an unsignalized location with parking. The treatments shown should be used in conjunction with advance warning signs (not shown).

Key Elements:

- See elements listed under Unsignalized Basic Mid-block Crosswalk.
- A bulb-out extends the pedestrian ramp into the sightlines of oncoming vehicles, reducing the potential for a “dart-out” type crash.

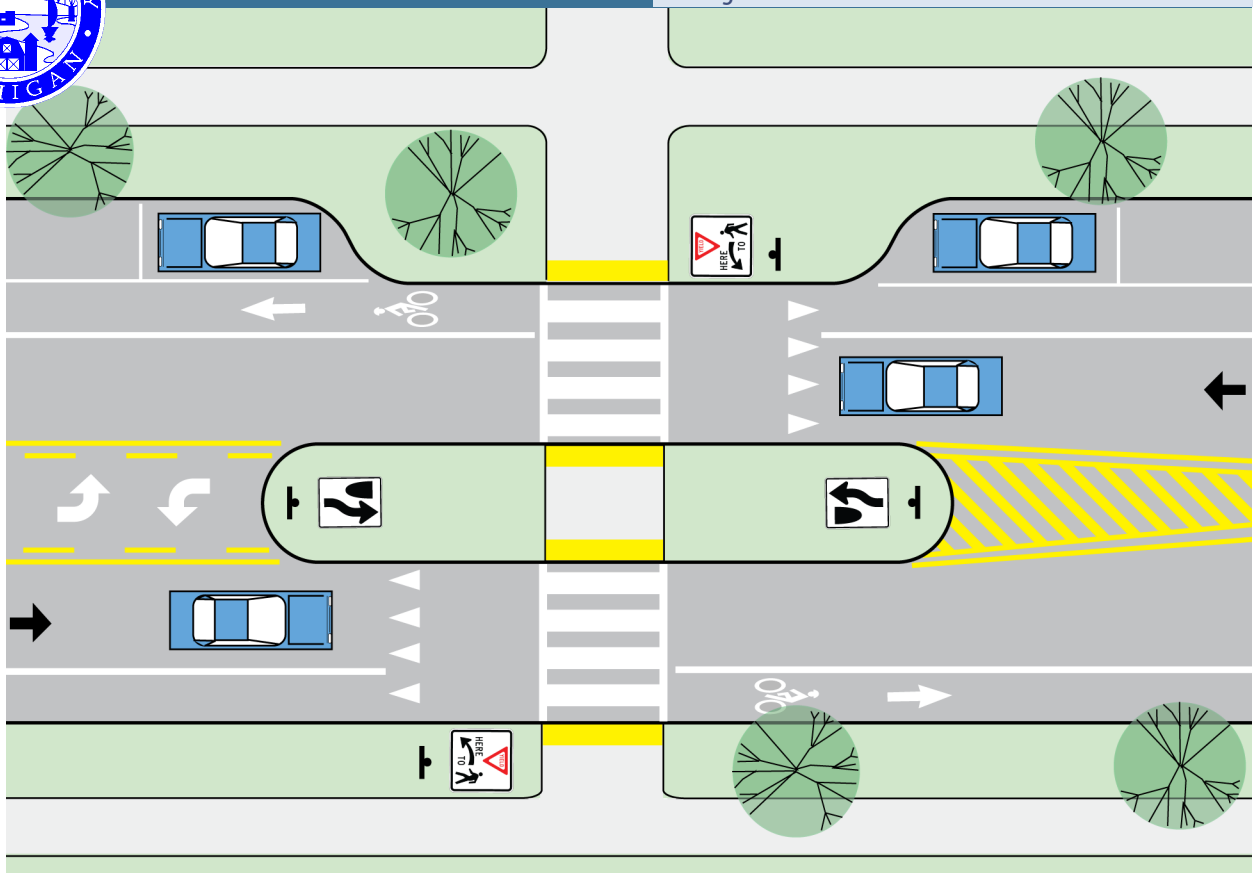
Applications

Generally used on relatively low volume, low speed roads where sufficient gaps in the motorized traffic exist. This crosswalk design should not be used in any situations where there are greater than two travel lanes.

Example

Abbot Road, Michigan State University, East Lansing, Michigan.

Mid-block Crosswalk with Crossing Island



Description:

A 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:

- A crossing 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 crossing islands should be kept low so as not to obstruct visibility.

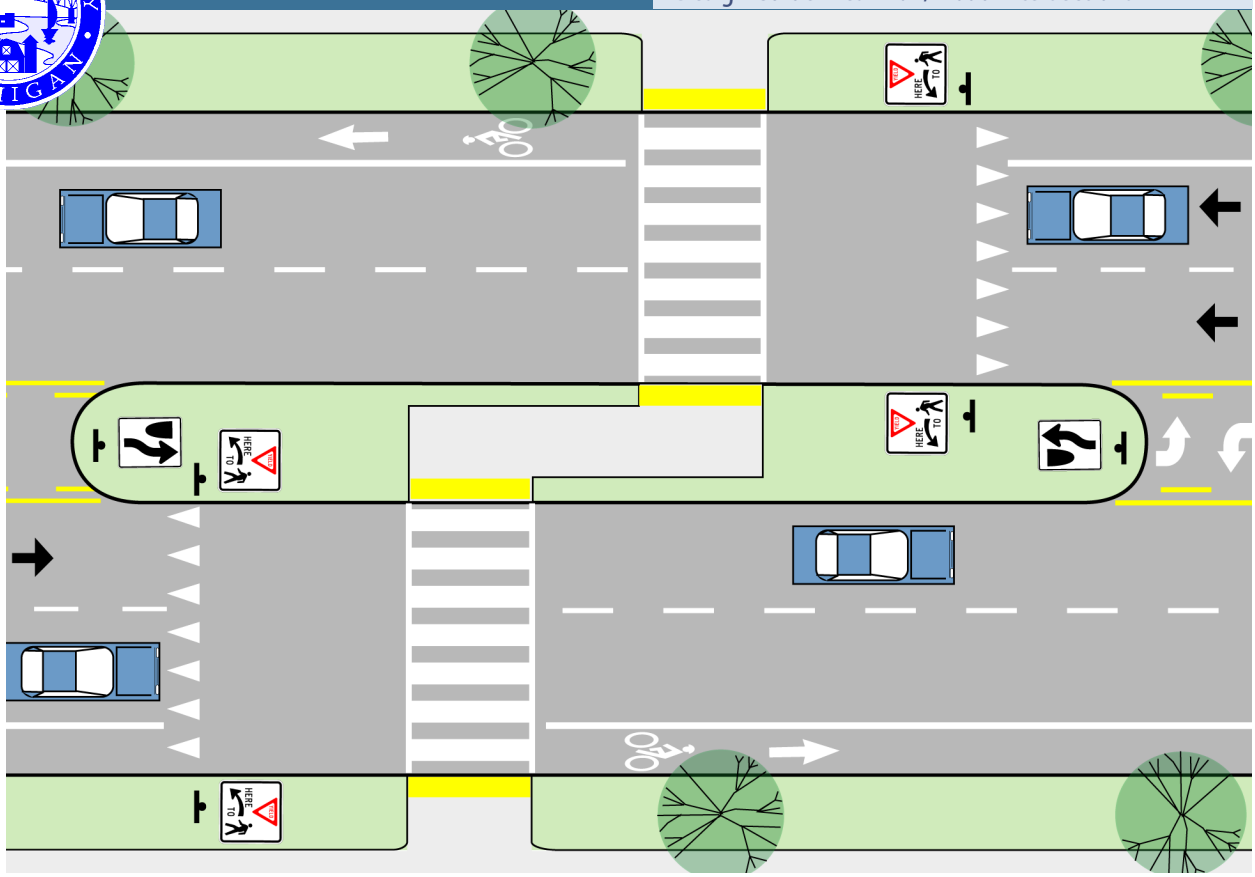
Applications

Generally used on a higher volume and higher speed road where suitable gaps to cross both directions of traffic in one movement are infrequent.

Example

Clinton River Trail at Livernois Rd, Rochester Hills, Michigan.

Unsignalized Mid-block Zig-zag Crosswalk



Description:

A mid-block crosswalk for a four or more lane road at an unsignalized location without parking.

Key Elements:

- The crosswalks are staggered to direct the pedestrian view towards oncoming traffic.
- Yield markings are set further back to improve pedestrian visibility from both lanes and minimize multiple-threat crashes.
- Median signs are placed higher than typical so as not to impede sightlines.

Applications

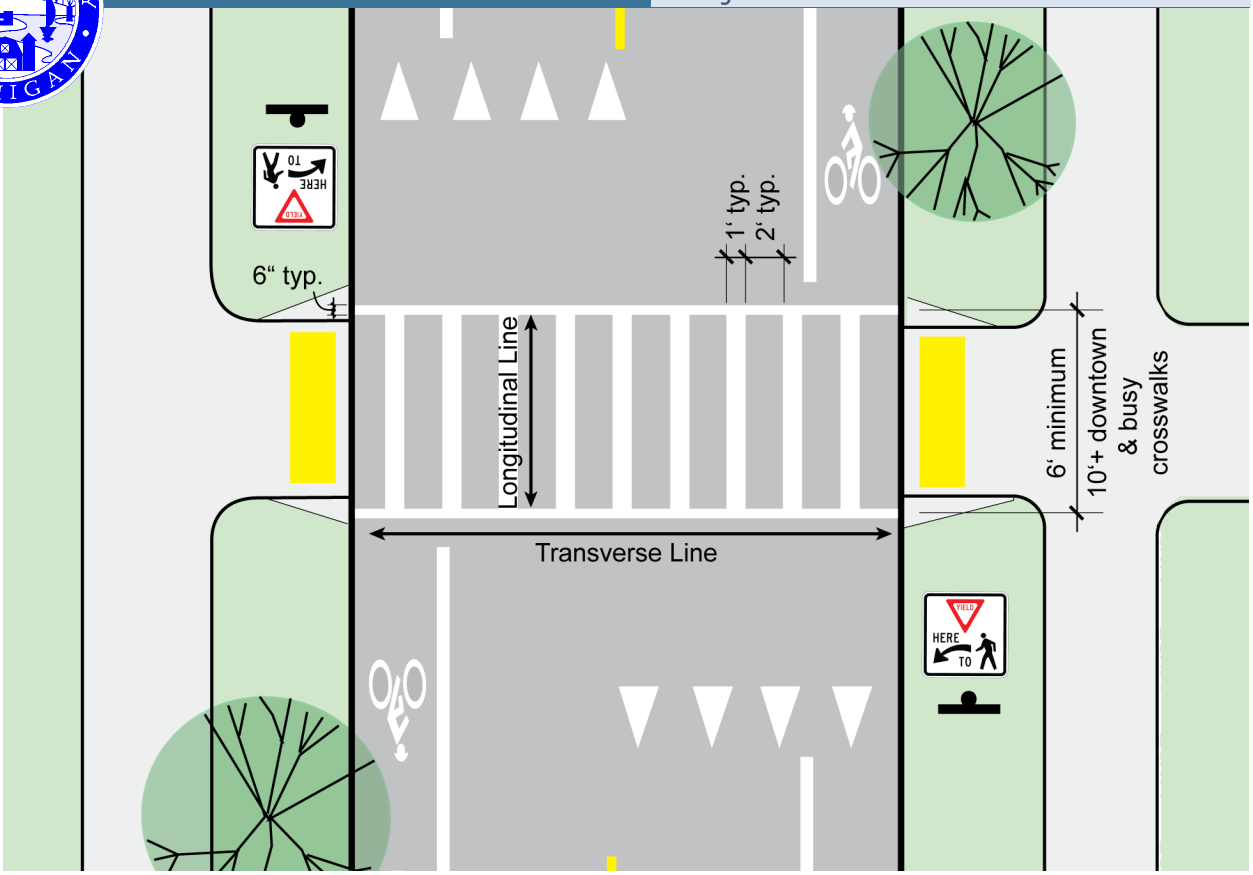
Generally used on high volume / high-speed multi-lane roads.

Example

Clinton River Trail at Adams Road, Rochester Hills, Michigan.

Ladder Style Crosswalk

Design Guidelines- Trail/ Road Intersections



Description:

A combination of Transverse and Longitudinal style crosswalks to improve visibility for motorists and usability for pedestrians with sight impairments.

Key Elements:

- All crosswalk markings are highly skid-resistant and strongly contrast pavement.
- Longitudinal lines are no more than 1’ wide to minimize areas of thermoplastic markings.
- Spacing of the longitudinal lines is no more than 2’ to improve the visibility of the crosswalk to motorists.
- Transverse lines are used to aid pedestrians with sight impairments in finding the edge of the crosswalks (this can be difficult with longitudinal lines alone, especially when spaced far apart).
- The width of the crosswalk is set such that it can easily accommodate all pedestrians crossing the road.

Applications

For all marked mid-block crosswalks across Arterial and Collector streets and signalized crosswalks downtown. Also, on local streets where there is a high potential for conflict between motorists and pedestrians such as crosswalks that serve schools. Locations where pedestrian crossing is sporadic require high visibility as the motorist’s expectation for the presence of pedestrians is low.

Example

Michigan State Univeristy

Hybrid Pedestrian Signal

Design Guidelines- Trail/ Road Intersection

Description

The Hybrid Pedestrian Signal is a beacon used to help pedestrians cross mid-block where a traditional pedestrian crosswalk signal would be inappropriate.

The hybrid pedestrian signal l is similar to an emergency beacon in that the signal's purpose is clearly signed adjacent to the signal.

The signal is kept dark at its resting state. When a pedestrian activates the crossing button, a flashing yellow signal is displayed to motorists. This is followed by a steady yellow then a solid red at which time the pedestrian is displayed a walk signal. During the clearance interval, the motorists are displayed an alternating flashing red signal. Motorists may then move forward if the pedestrian or bicyclist has already crossed the road.

Applications

Mid-block crosswalk locations where poor sight lines, infrequent usable gaps and/or inability to install a crossing island make an unsignalized crossing unsafe.

Sequence of Pedestrain Beacon

Dark Until Activated

Flashing Yellow

Steady Yellow

Steady Red during Pedestrian Walk Interval

Alternating Flashing Red During Pedestrian Clearance Interval

Lighting of Crosswalks

All marked crosswalks should be well lighted with overhead lighting. The light should be positioned such that it illuminates the side of the pedestrian facing the oncoming traffic. Ideally, the lighting should also extend to light the extent of any crossing island for the motorists safety. The use of reflective bollards in combination with lighting can greatly increase the visibility of a crosswalk at night.

An overhead lighted crosswalk sign also provides illumination of a crosswalk on Oak Valley Drive in Scio Township, Michigan.

Marking of Crossing Island

Crossing islands can present an obstruction in the roadway for motorists. The presence of this obstacle is key to the visibility of the crosswalk even more so than the signage or pavement markings and flush crossing islands have not been shown to have the same safety benefits as raised crossing islands. When the crosswalk is located in a left-turn lane it is located outside of the typically traveled roadway and is a minimum obstruction. When the road flairs around a crossing island it is more of an obstruction for a motorist. To draw attention to the obstruction, typical pavement markings as called for in MMUTCD should be utilized. In addition, reflective material may be added to the sign posts, and reflective flexible bollards may be placed on the ends of the islands to increase the island's visibility at night and during inclement weather.

Signs and Wayfinding

Overview

Careful and thoughtful use of signage can greatly enhance a user's experience of the trail. Signs are used to alert users of road crossings, guide users along their way and inform users of interesting historical perspectives along the trail. Several important considerations for the design and use of signage are:

- Keep signage consistent in design along the length of the trail to establish a sense of continuity and character.
- Signs should be clearly legible, understandable, and be made of fade-proof and weather-proof surface materials and inks.
- Signs should be durable and require minimal maintenance.
- Signs should be placed to prevent obstruction or collision along the trail.

Recommended Design Elements

Repetition of a sign design, color scheme or logo along the trail reinforces the image of a common trail identity through different jurisdictions. We recommend a family of signs that provide a design vocabulary along the trail. Consistent elements in all of the various sign applications include:

- Stained cedar post with a decorative black post end cap.
- Aluminum signs that can be easily removed from the supporting posts and replaced as necessary.
- Consistent use of trail logo for specific trails (i.e. Wadhams to Avoca Trail, Rail to River Trail, and Bridge to Bay Trail).

Placement of Signs

If designed correctly, signage can be a pleasing amenity to the trail while providing valuable safety and orientation information to the users of the trail. Key considerations for the placement of trail signage include:

- Signs should be placed at the beginning of trail intersections with the roadway to orient the user to his or her location along the trail, the distance to the next intersection crossing, and the rules and regulations of the trail.
- Signs should be a sufficient distance from the shoulder of the trail to prevent obstruction or collisions, with a minimum being 2'.
- Signs should be placed outside the road ROW and positioned to allow access for maintenance vehicles to the trail.
- Include flat graded areas at the trail intersections where people can gather without blocking the trail.

Trail Signs at Roadway
Trail Exit View

Sign Detail

Key Recommendations:

- Two sign posts form a gateway to the trail at road intersections.
- On the right above a Stop or Yield sign, a standard street name sign is used to identify the cross street.
- All parts of the signs should be set back 3’ from the trail.
- On the left side an optional plaque identifies the local agency in charge of the trail, trail rules, and emergency and maintenance contact numbers.
- Signposts should be a 4 x 4 cedar post or a square metal tube, painted back and without any holes below the signs.
- The back of the signs should be painted black.

Trail Signs at Roadway
Trail Entrance View

Sign Detail

Key Recommendations:

- On right side a No Motor Vehicle Sign and a Bicycles Yield to Pedestrian Sign should be posted to address the key rules of the trail.
- On the left side an optional Bike Route sign listing the direction and distance to the next major destination may be placed.
- On the left an optional numbered Bike Route Sign that includes a custom logo, direction of travel and the route name may be used to identify key County Bike Routes.
- On the left an optional sign may be used to identify the local agency responsible for the trail and/or the agency that funded the trail.
- A detectable warning strip should be placed across the entire trail.
- Pavement marking should be used for the first 100 to 150’ of trail .

Bike Route Sign with Custom Logo

The Bike Route Sign above is typically used with auxiliary plaques above that indicate the direction of travel and any changes in direction of the route.

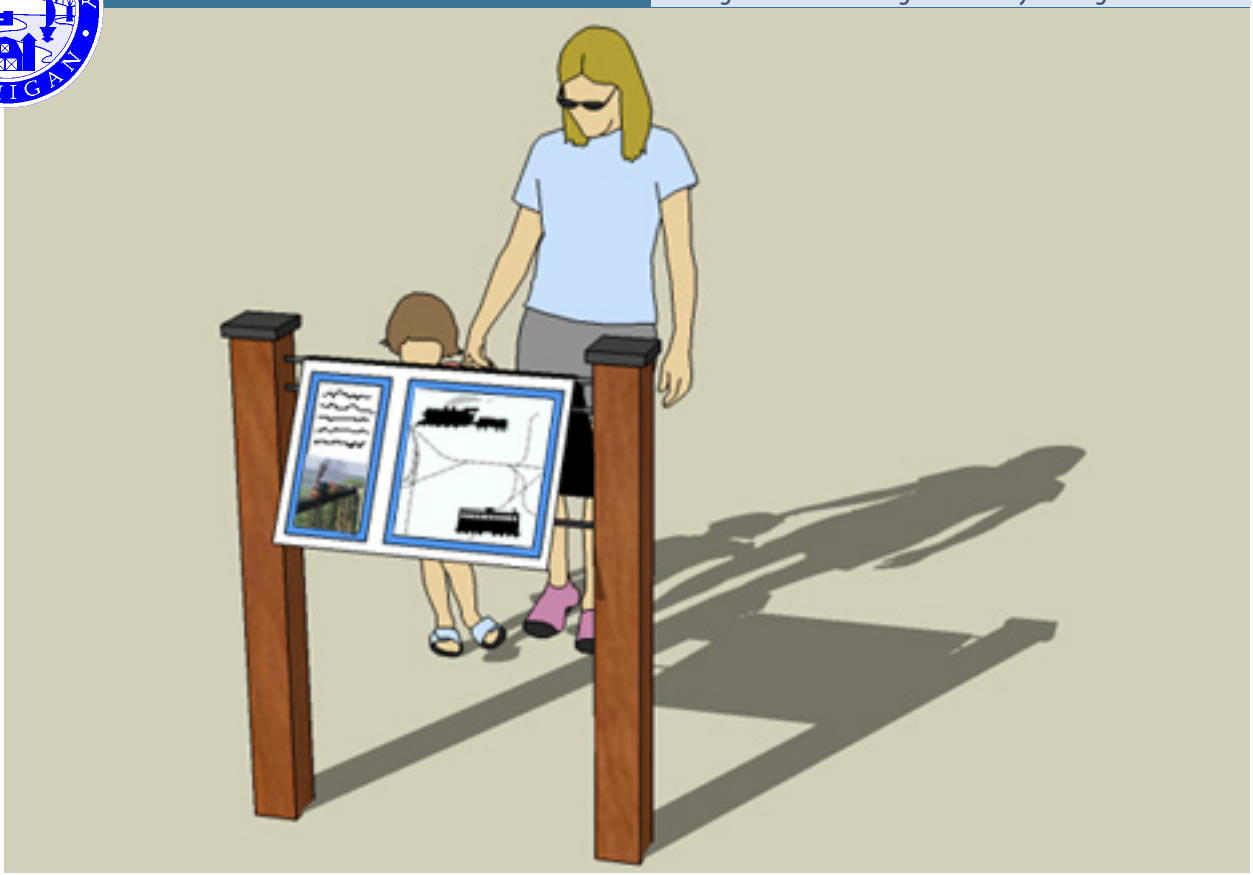
Description

Bike Route Guide Signs (shown above) are used on designated bike routes to inform bicyclists of changes in direction and the distance to next destination. Bike Route Signs (shown to left) establish a unique identification for a Bike Route.

Applications

- Bike Route Guide Signs (shown above) are placed at changes in direction of designated bike routes. Not every bicycle facility necessarily be designated a bike route. Bike routes should be used where the signage would help direct a bicyclist to a key destination that may not be obvious.
- Bike Route Signs (shown to left) should be used where it is helpful to establish a unique identity for a bike route. This may be helpful where a long-distance route is comprised of a number of different facility types or is a long-distance route significant to the county.

Interpretive Sign



Description

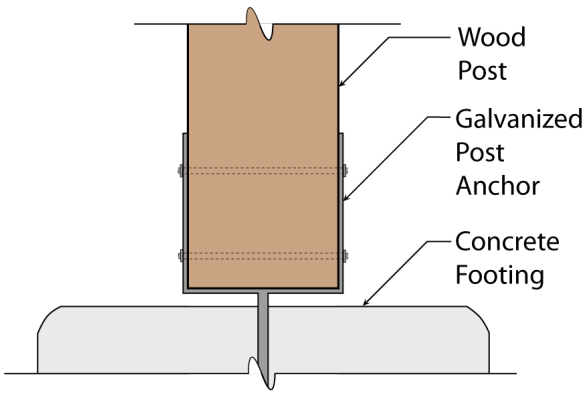
Interpretive signage along the St. Clair County trails can draw upon the unique character of the county to increase users appreciate of the history of the area.

There are many different opportunities for providing interpretation of historically significant points along the trails. Ideas could include cultural history of the railroad or ecological and geological phenomenon such as native prairie remnants, local animal habitats, or evidence of the glacial history of the area.

Applications

- Locate the signs to “frame” the view of the subject being discussed on the sign if possible.
- Place signs in clear areas at least 4’ off the side of the path so groups of pedestrians, wheelchair users or people on bicycles can be completely out of the travel lane while reading signs.
- Provide appropriate surfacing around the trail.
- Combine the signs with shaded rest areas along the trail.
- The angled sign mounting can accommodate two-sided or one-sided viewing.

Post To Footing Attachment Detail



Description

A sign placed at the entrance drive of each staging area will help to clearly identify access points and parking to the trail system.

Applications

- Aluminum sign board with rounded corners and black back or with the same or similar text on back.
- The cedar post is bolted to a concrete footing to enhance its durability and the ease with which it can be replaced or re-stained.

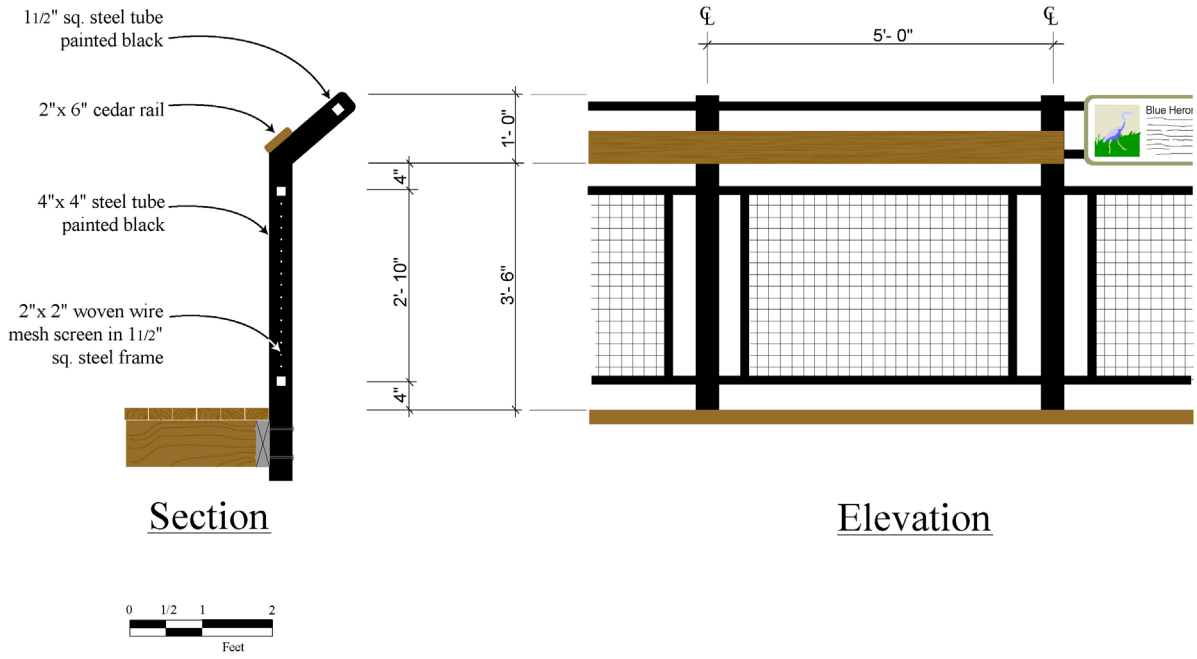
Trail Head Information Kiosk

Description

At each trail head a kiosk should be placed to serve as a starting point and help orient the rider or walker along their route.

Applications

- To help trail user get their bearings, the kiosk is sited within a large Compass Rose. The Compass Rose could be inlayed colored asphalt, thermoplastic paint, or durable paint.
- At a minimum the kiosk panels should include a map of the local trail route and a description of the trail rules. Additional information could include a regional map of county trails, interpretive information, or a place to dispense paper maps.
- The angled sign mounting can accommodate two-sided viewing.



A CTX “Rocky Mountain” building along the Clinton River Trail in Rochester, Michigan

Example

An existing railroad trestle re-fitted with a new railing on the Clinton River Trail in Rochester Hills, Michigan.

Key Recommendations:

- The retracted angle of the railing top allows bikes to be ridden close to the railing of the bridge without the handle-bars colliding with the top safety bars of the railing.
- The retracted angle of the railing allows the top portion of the railing to serve as a base for interpretive signage.
- The black steel tubing and woven wire mesh is designed to be simple and unobtrusive while providing protection to bicyclists, pedestrians and small children.

Prefabricated Concrete Vault Toilet Building

A CTX “Rocky Mountain” building along the Clinton River Trail in Rochester, Michigan

Custom Finished Example

Romtec “Sierra” building with custom exterior finishes

Key Recommendations:

- A prefabricated concrete structure vault toilet building that is designed to minimize odors and maintenance.
- Closer to town a double-vault toilet building are recommended, in rural areas a single-vault toilet building may be adequate.
- A covered entryway adds character to building and shelter.
- Some manufactures allow the ability to customize the exterior finishes.
- Give special consideration to manufacturers specialize in using sustainable materials and manufacturing processes.

Trash/ Recycling Bin Detail

Key Recommendations:

- Scarborough bench and receptacles from Landscape Forms in black.
- Horizontal slated bench.
- Trash receptacle.
- Container recycling receptacle.

Implementation Guide

Implementation Matrix

Implementation Guide

Cost Opinion

Implementation Matrix

	Trail Name	Requires Easement or Acquisition	Dependent on Project by Others	Significant Capital Expense Requiring Outside Funding	Existing Safety Concern	Priority	Target Year for Construction
Wadhams to Avoca Trail:							
	Interpretive Signs	No	No	No	No	Upgrade	2009
	Wadhams Road Crossing	Yes	No	Yes	Yes[1]	Upgrade	2009
	Crossing Improvements	No	No	No	Yes[2]	Upgrade	2009
Bridge to Bay Trail:							
	Guide and Identification Signage	No	No	No	Yes	Upgrade	2009
Wadhams to Avoca Trail/ Bridge to Bay Trail Connectors:							
	Rails to River Trail	Yes	Partly[3]	Yes	Yes[4]	First	2010-2011
	Gateway Bike Route	No	Yes[5]	No	No	Third	2016-2020
	Two Bridges Trail	Yes	Yes[6]	Yes	No	Third	2016-2020
	CN Spur Trail	Yes	Partly[7]	Yes	No	Third	2016-2020
	Trail Connector Bike Route	No	Partly[7]	No	No	Third	2016-2020
*	Township Connector Trail	Yes	No	Yes	No	Third	2016-2020
Macomb Orchard Trail/ Bridge to Bay Trail Connectors:							
	CN Trail/ Power Line Trail	Yes	No	Yes	No	Third	2012-2015
	Park Link Bike Route	No	No	No	No	Optional	2009
	Belle River Way Bike Route	No	No	No	No	Optional	2009
Northern Connectors:							
	Lake Huron Bike Route	No	No	No	Yes	First	2009
*	Fort Gratiot Trail System Extensions	Yes	No	Yes	No	Third	2016-2020
	Riverside Bike Route	No	Yes[8]	No	No	Third	2016-2020
Central Connectors:							
	Yale to Avoca Trail	Yes	No	Yes	No	Fourth	2020-2024
	Goodells County Park Connector	No	No	No	No	Fourth	2020-2024
	Columbus to Greenwood Trail	Yes	No	Yes	No	Fourth	2020-2024
Southern Connectors:							
	Harsens Island Bike Route	No	No	No	No	Upgrade	2009
	New Baltimore Bike Route	No	No	No	Yes	Upgrade	2009

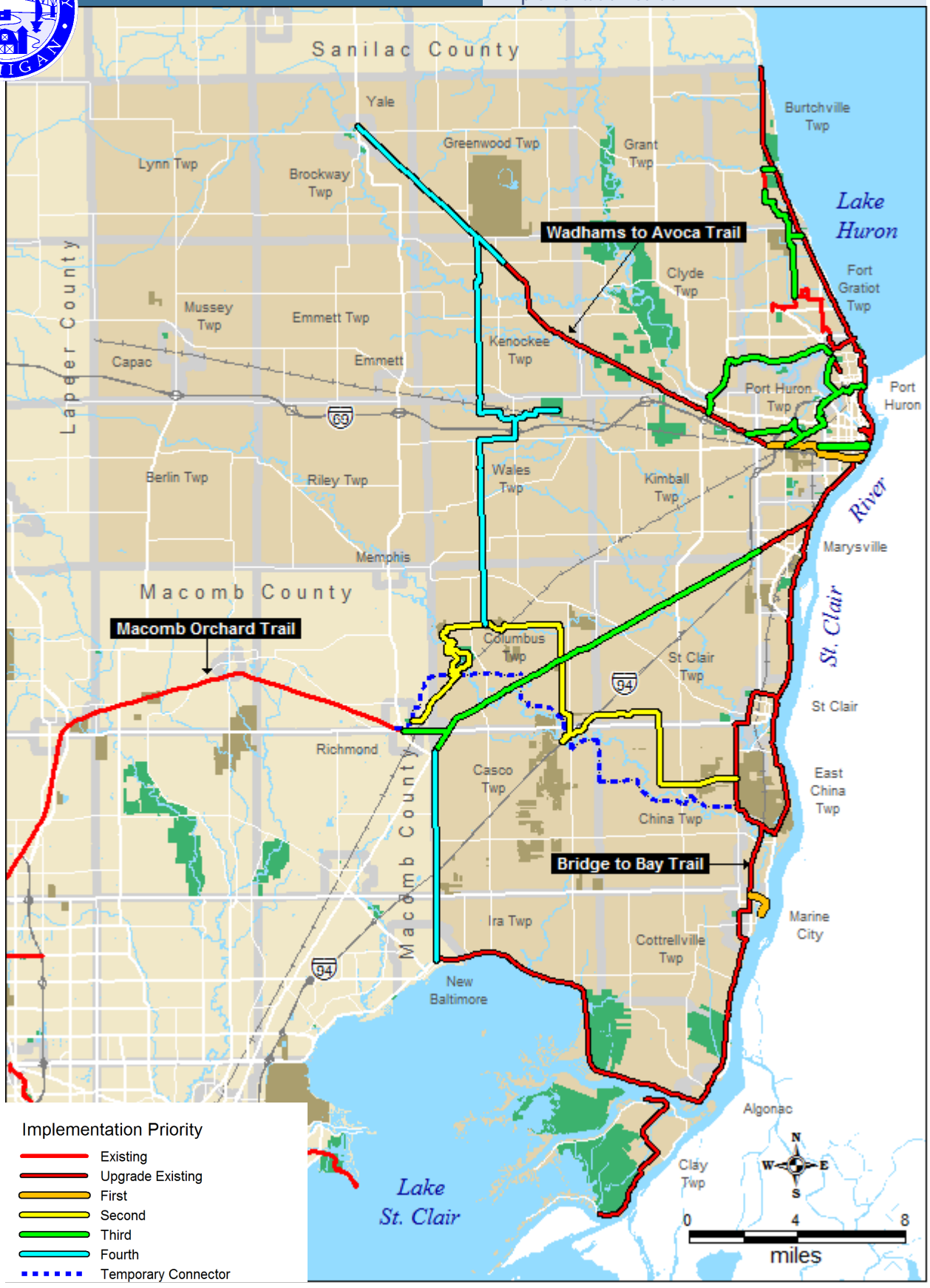
Implementation Matrix Notes:

Each trail or route has been assigned one of the following priorities: Upgrade, First, Second, Third or Optional. Upgrade, means an existing or nearly complete facility that should be upgraded prior to constructing any new facilities. First, Second and Third indicate the order in which the new trails and routes should be built. Optional, is for a temporary route that may be implemented immediately as the long-term trail will take a number of years to implement.

The following notes relate to the table to the left.

1. The Wadhams Road Crossing address an unmarked crossing point at a dangerous location in the roadway.
2. The Crossing Improvements will improve crosswalk alignment, markings and signage of the existing trail crosswalks.
3. The Rails to River Trail would ideally coordinated with Michigan Street overpass improvements, but the majority of the project may be constructed separately.
4. The Rails to River Trail would improve the safety of pedestrians and bicyclists accessing the trail from Port Huron as no suitable route currently exists from Port Huron to the trail.
5. The Gateway Trail should be undertaken as part of the reconstruction of business route I-69
6. The Two Bridges Trail is totally dependent on Black River Bridge reconstruction project and the Blue Water Bridge Plaza project.
7. While not dependent on the Blue Water Bride Project one of the key aspects of this trail is to provide a link to the trail proposed to be a part of the Black River Bridge project.
8. Wadhams Road bridge replacement over the Black River should be completed and a portion of t

* indicates a project where another agency will likely be the lead agency.


Sanilac County
Yale
Lynn Twp
Brockway Twp
Greenwood Twp
Grant Twp
Burtchville Twp
Lake Huron
Wadhams to Avoca Trail
Clyde Twp
Fort Gratiot Twp
Lapeer County
Mussey Twp
Emmett Twp
Capac
Emmett
Kenockee Twp
Port Huron Twp
Port Huron
69
Berlin Twp
Riley Twp
Wales Twp
Kimball Twp
St. Clair River
Memphis
Marysville
Macomb County
Macomb Orchard Trail
Columbus Twp
St Clair Twp
94
St Clair
Richmond
Casco Twp
East China Twp
China Twp
Macomb County
Bridge to Bay Trail
Ira Twp
Marine City
Cottrellville Twp
New Baltimore
Algonac
Clay Twp
Lake St. Clair
N
W
E
S
0
4
8
miles
Implementation Priority
Existing
Upgrade Existing
First
Second
Third
Fourth
Temporary Connector

Implementation Plan

Phase One - 2009

Construction:

- **Wadhams to Avoca Trail** –Upgrade exiting street crossings, construct Lapeer Road Staging Area and Construct Wadhams Road Crossing, $350,000.
- **Bridge to Bay Trail Guide & Identification Sign System** – Install Guide and Identification Sign System, $275,000.

Pre-construction:

- **Secure Property/Easements** – For Rail to River Trail between 24th Street and Military Street.
- **Prepare Construction Documents** – For Rail to River Trail between Wadhams to Avoca Trail and 24th Street, $100,000.
- **Seek Rail to River Trail Funding** – Apply for two years of Enhancement Funding and seek local private funding for the Rail to River Trail.

Phase Two - 2010

Construction:

- **Rail to River Trail West Half** – From Bridge to Bay Trail to 24th Street, $1,000,000.

Pre-construction:

- **Secure Property/Easements** – For CN Trail and Power Line Trail
- **Prepare Construction Documents** – For Rail to River Trail between 24th Street and Military Street, $100,000.
- **Seek CN and Power Line Trail Funding** – Prepare Trust Fund Application seeking funding for the entire CN and Power Line Trail between Richmond and East China Township to be implemented over tour years as well as seek funding from local private pubic sources.

Phase Three - 2011

Construction:

- **Rail to River Trail East Half** – From 24th Street to Military Street, $1,000,000.

Pre-construction:

- **Prepare Construction Documents** – For CN Trail between Richmond and Columbus County Park and Columbus County Park Loop. $100,000.

Phase Four - 2012

Construction:

- **CN Trail** – From Richmond to Columbus County Park and Park Loop, $1,000,000.

Pre-construction:

- **Prepare Construction Documents** – For Power Line Trail from Columbus County Park to Adair, $100,000.

Phase Five - 2013

Construction:

- **Power Line Trail** – from Columbus County Park to Adair., $1,000,000.

Pre-construction:

- **Prepare Construction Documents** – For Power Line Trail from Adair to St. Clair Highway, $100,000.

Phase Six - 2014

Construction:

- **Power Line Trail** – From Adair to St. Clair Highway, $1,000,000.

Pre-construction:

- **Prepare Construction Documents** – For Power Line Trail from St. Clair Highway to King Road, $100,000.
- **Re-evaluate Third Priority Trails and Routes** – Determine status of Business Route 69 Reconstruction, Gratiot Reconstruction, Black River Bridge and Toll Plaza Projects are at a stage where the trail and route projects should be initiated.

Phase Seven - 2015

Construction:

- **Complete Power Line Trail** – From St. Clair Highway to King Road, $1,000,000.

Pre-construction:

- **Secure Easements** – For third priority trails.
- **Prepare Construction Documents** – For first part of third priority trails.

Phase Eight - 2016 through 2020

- **Third Priority Trails**

Phase Eight - 2020 through 2024

- **Fourth Priority Trails**

Preliminary Cost Opinion Summary

Item	Quantity	Unit	Unit Cost	Item Total
Rail to River Trail				
Griswold Staging Area	1	Lump Sum	$140,000	$140,000
Griswold Crossing at WTA Trail End	1	Lump Sum	$6,000	$6,000
WTA to Michigan Rd Sidewalk & Bike Lanes	2,809	Lineal Feet	$80	$224,720
Tunnel Yard Overlook on New Overpass	1	Lump Sum	$120,000	$120,000
Michigan Rd to 28th Street Separated Use Path	6,874	Lineal Feet	$57	$390,448
28th St to 24th Street Separated Use Path	2,239	Lineal Feet	$57	127,177
24th Street Staging Area	1	Lump Sum	$82,874	$82,874
24th Street Overpass	1	Lump Sum	$275,000	$275,000
24th Street to 16th Street Separated Use Path	2,561	Lineal Feet	$57	$145,466
16th Street Crossing	1	Lump Sum	$65,000	$65,000
16th Street Staging Area	1	Lump Sum	$155,000	$155,000
16th Street to 10th Ave Separated Use Path	2,660	Lineal Feet	$57	$151,090
10th Street Crossing	1	Lump Sum	$35,000	$35,000
10th Street to Millitary St Tunnel	1,683	Lineal Feet	$57	$95,596
Millitary St. Tunnel Landscaping and Mural	1	Lump Sum	$30,000	$30,000
Interpretive Signs	6	Each	$400	$2,400
			Subtotal	**$2,045,770**
CN Trail / Power Line Trail				
Shared Use Path	139,606	Lineal Feet	$23	$3,228,454
Standard At Grade Road Crossings	20	Each	$6,000	$120,000
Minor Culvert Bridge Over Creek	4	Each	$20,000	$80,000
I-94 Underpass at Belle River	1	Lump Sum	$100,000	$100,000
Staging Areas	5	Each	$100,000	$500,000
			Subtotal	**$4,028,454**
Wadhams to Avoca Trail Upgrade				
Shared Use Path	500	Lineal Feet	$23	$11,563
Standard At Grade Road Crossings	17	Each	$6,000	$102,000
Wadhams Road Crossing Hybrid Pedestrian Beacon	1	Lump Sum	$125,000	$125,000
Lapeer Road Staging Area	1	Lump Sum	$115,000	$115,000
			Subtotal	**$353,563**

Appendix

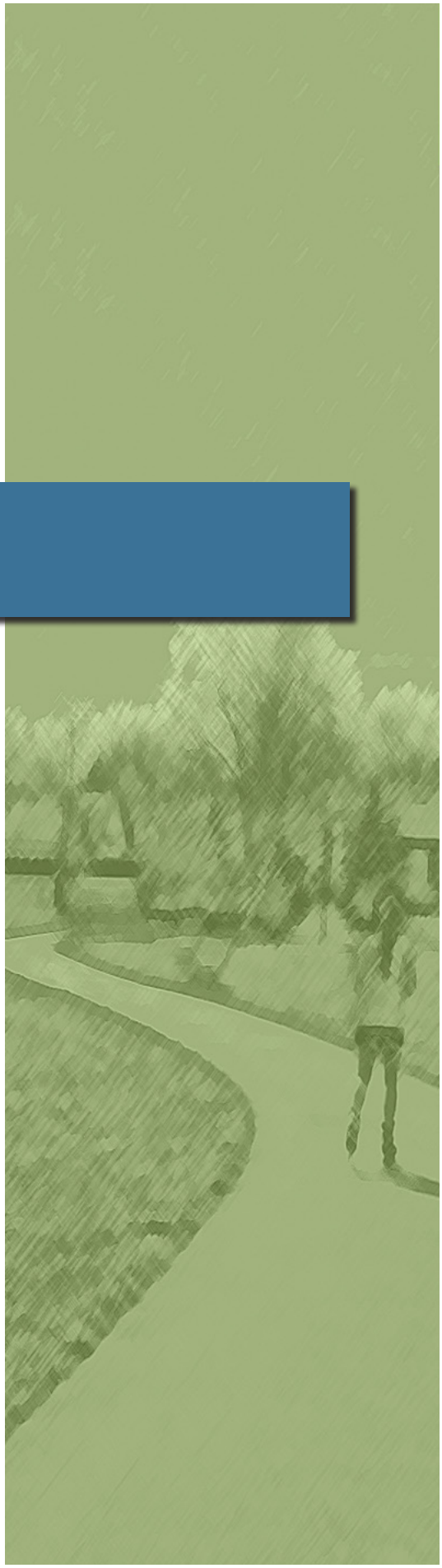
South County Connector Inventory & Analysis

South County Connector Visioning Workshop

South County Park Alternatives

South County Connector Alternatives Workshop

Wadhams to Avoca Trail Crossing Alternatives



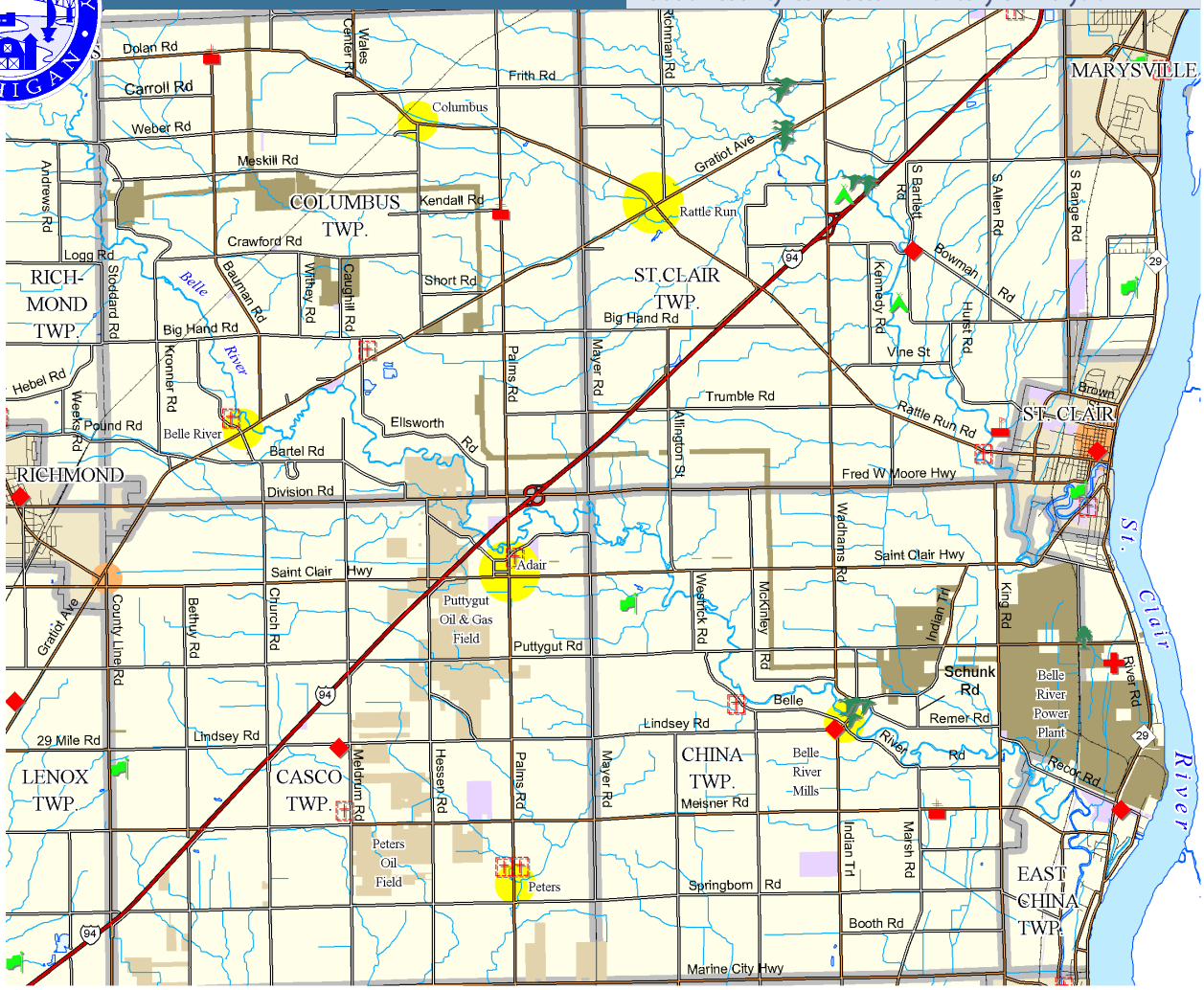
South County Connector Inventory and Analysis Maps

In 2003, a number of maps where prepared to evaluate the feasibility of various routes, these include:

- **Base Map**
- **Existing Land Use**
- **Existing Zoning**
- **Aerial Photograph**
- **Wetlands and Hydric Soils**
- **Property Ownership**
- **Adair Area Aerial Photograph**

Base Map

South County Connector Inventory & Analysis



Community Resources:
- Government Center
- Hospital

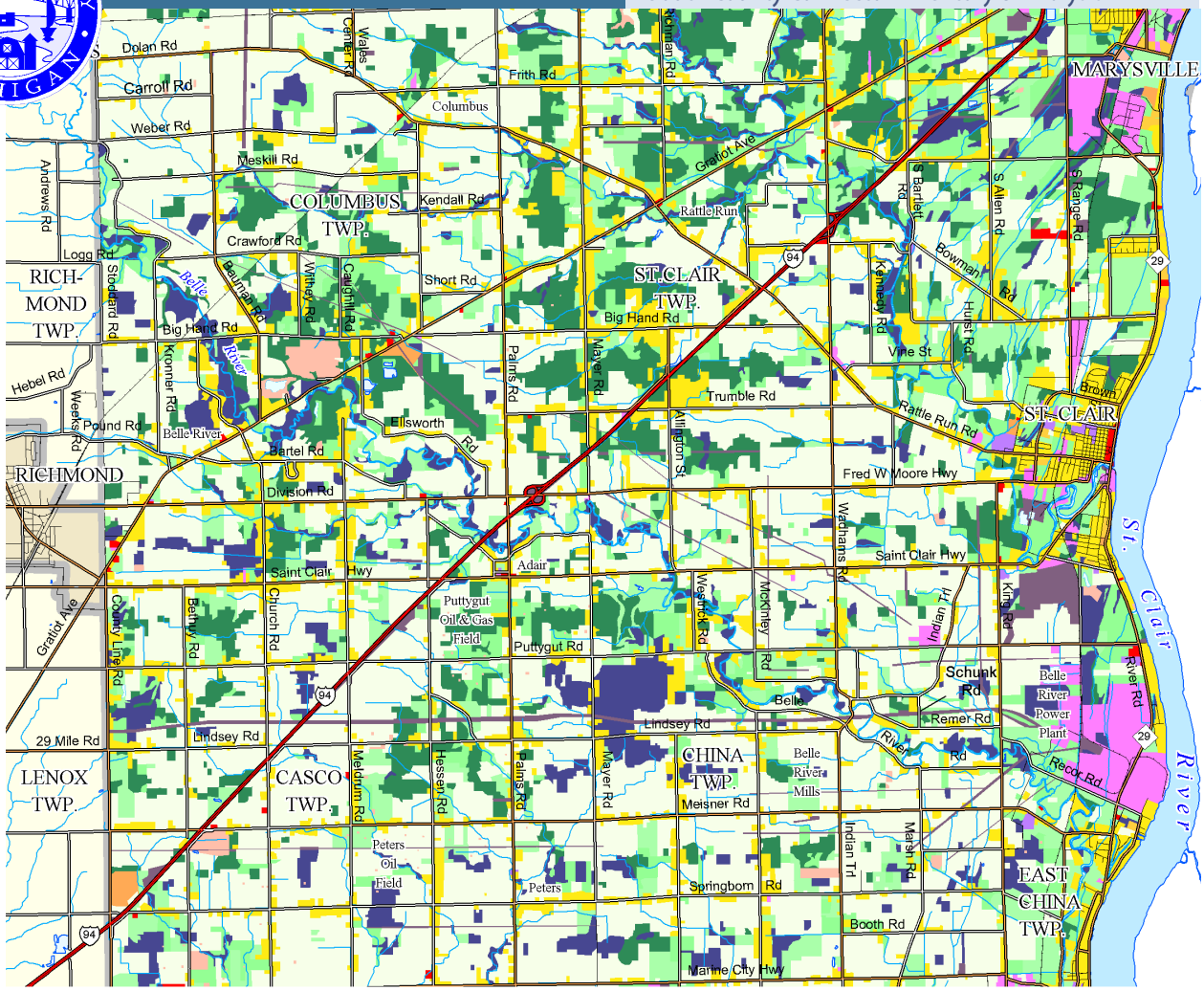
Historical and Cultural Sites:
- Cemetery
- Church

Recreation Resources:
- Camp or Campground
- Golf Course

Critical Natural Features:
- Animal or Animal Habitat
- Plant or Plant Association

Educational Facilities:
- College or University
- High School

Commercial & Cultural Centers:
- Cultural Centers
- Commercial Centers

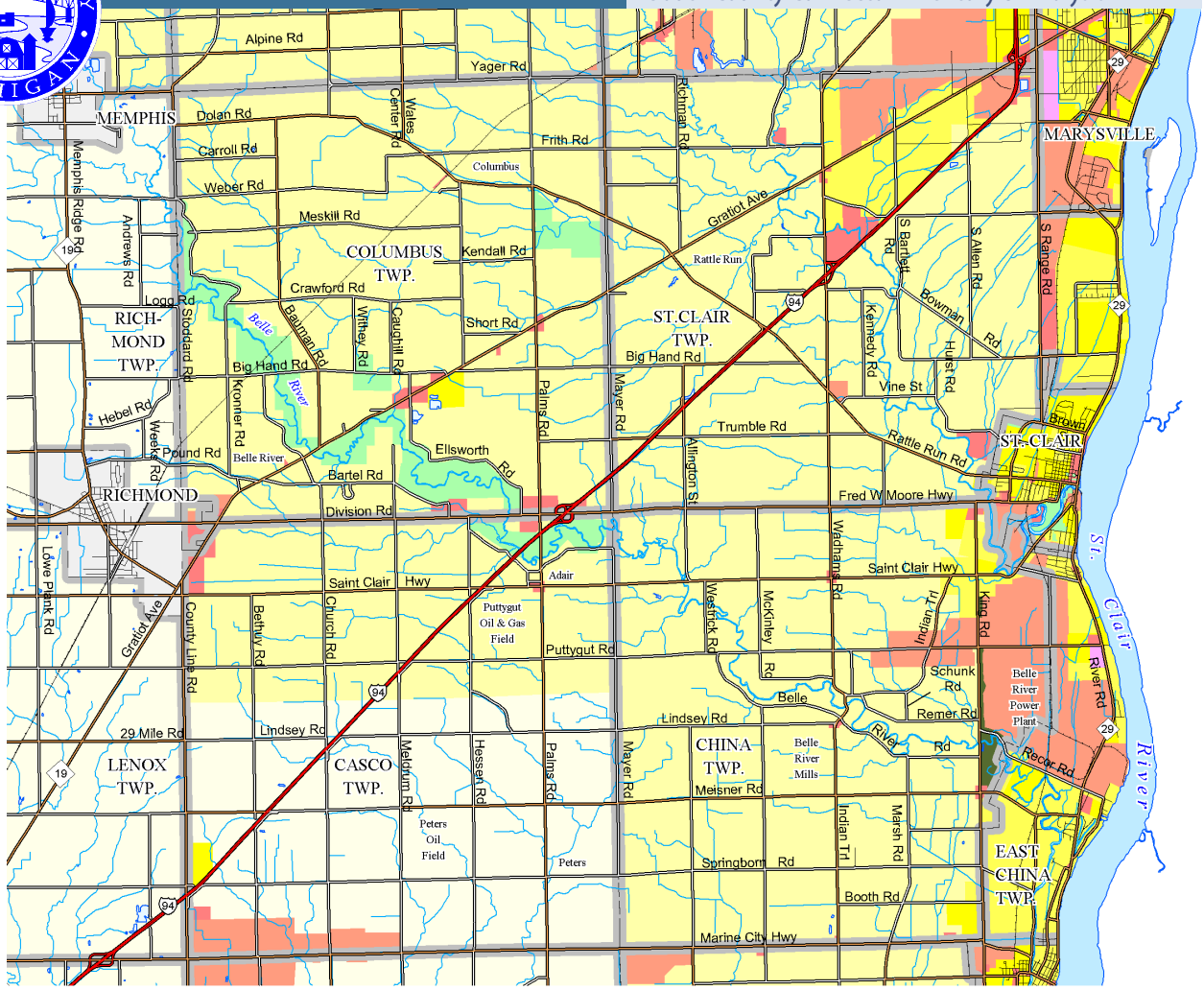


Existing Land Use:

- Multi-Family Residential
- Single-Family Residential
- Mobile Home Park
- Commercial
- Institutional
- Office
- Industry
- Transportation and Utilities
- Extractive
- Recreation and Open Space
- Agriculture
- Open Fields
- Forested
- Wetlands
- Barren

Existing Zoning

South County Connector Inventory & Analysis



Existing Zoning:

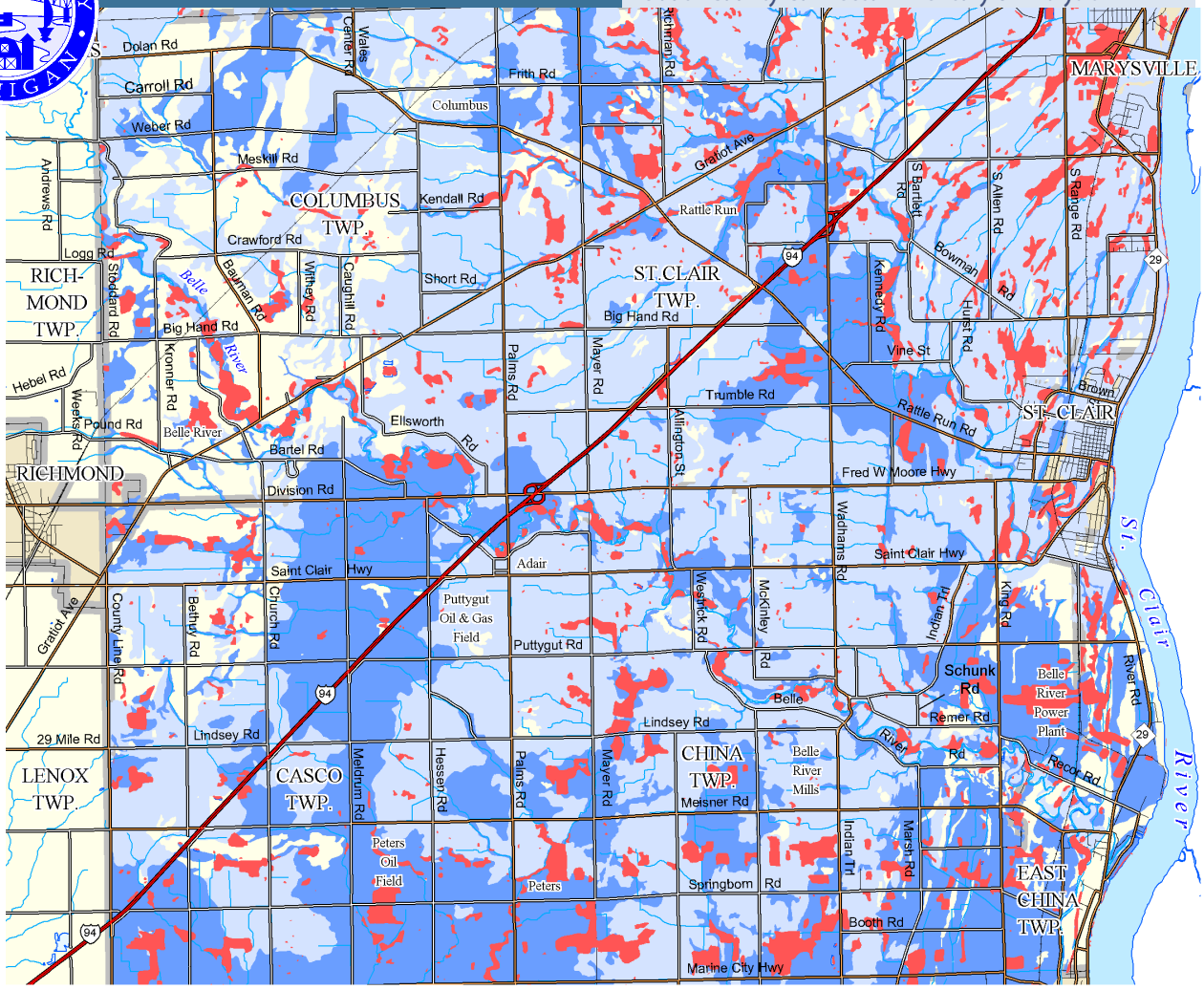
- Recreation and Open Space
- Commercial
- Office and Research Park
- Institutional and Public Facilities
- Industrial
- Transportation
- Commercial Recreation
- Agriculture/ Rural Residential
- Low density Residential
- Medium Density Residential
- Multi-Family Residential

Aerial Photograph and Parcel Map

South County Connector Inventory & Analysis

Wetlands and Hydric Soils

South County Connector Inventory & Analysis



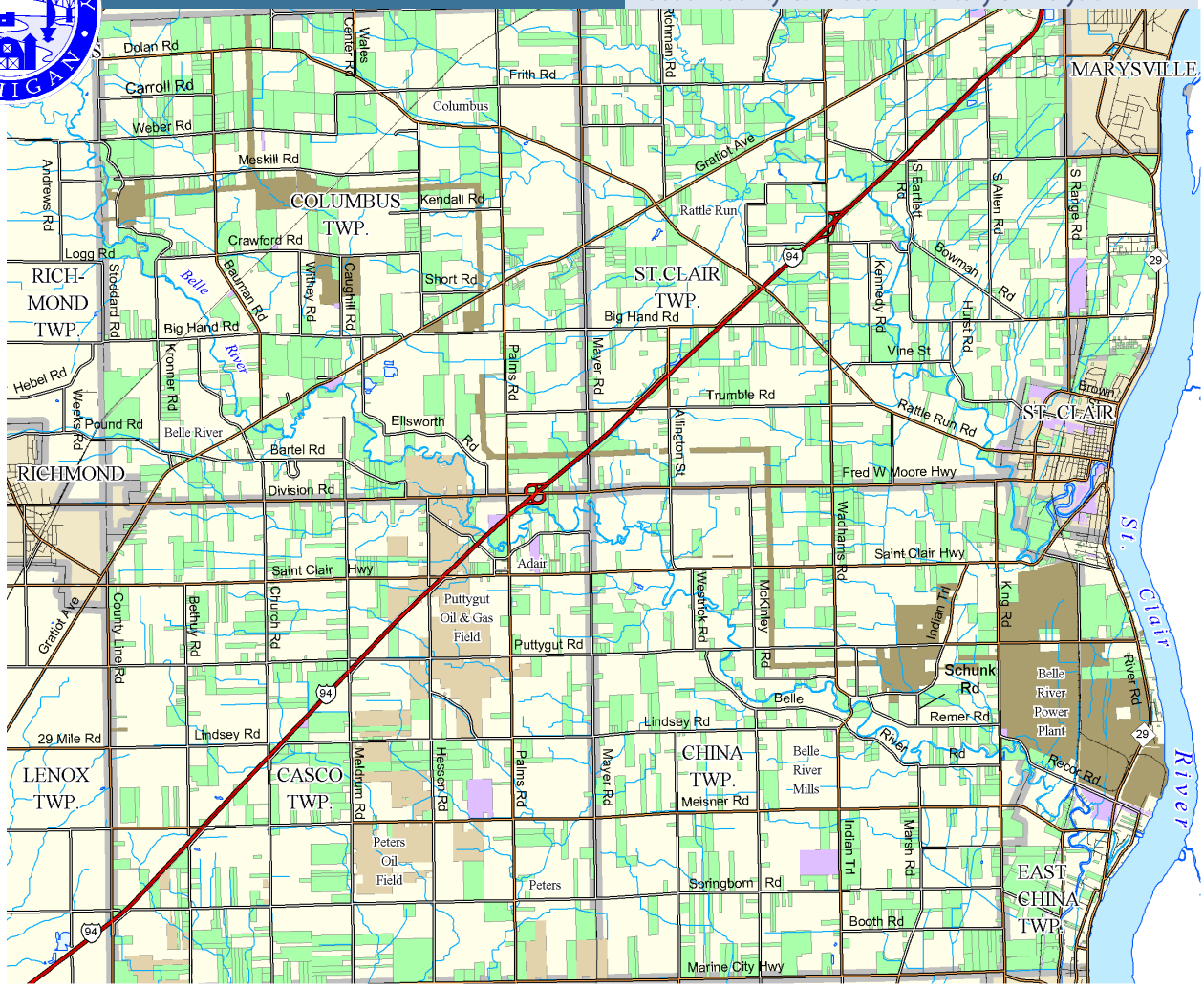
Wetlands

Hydric Soils:

- Partial
- Hydric

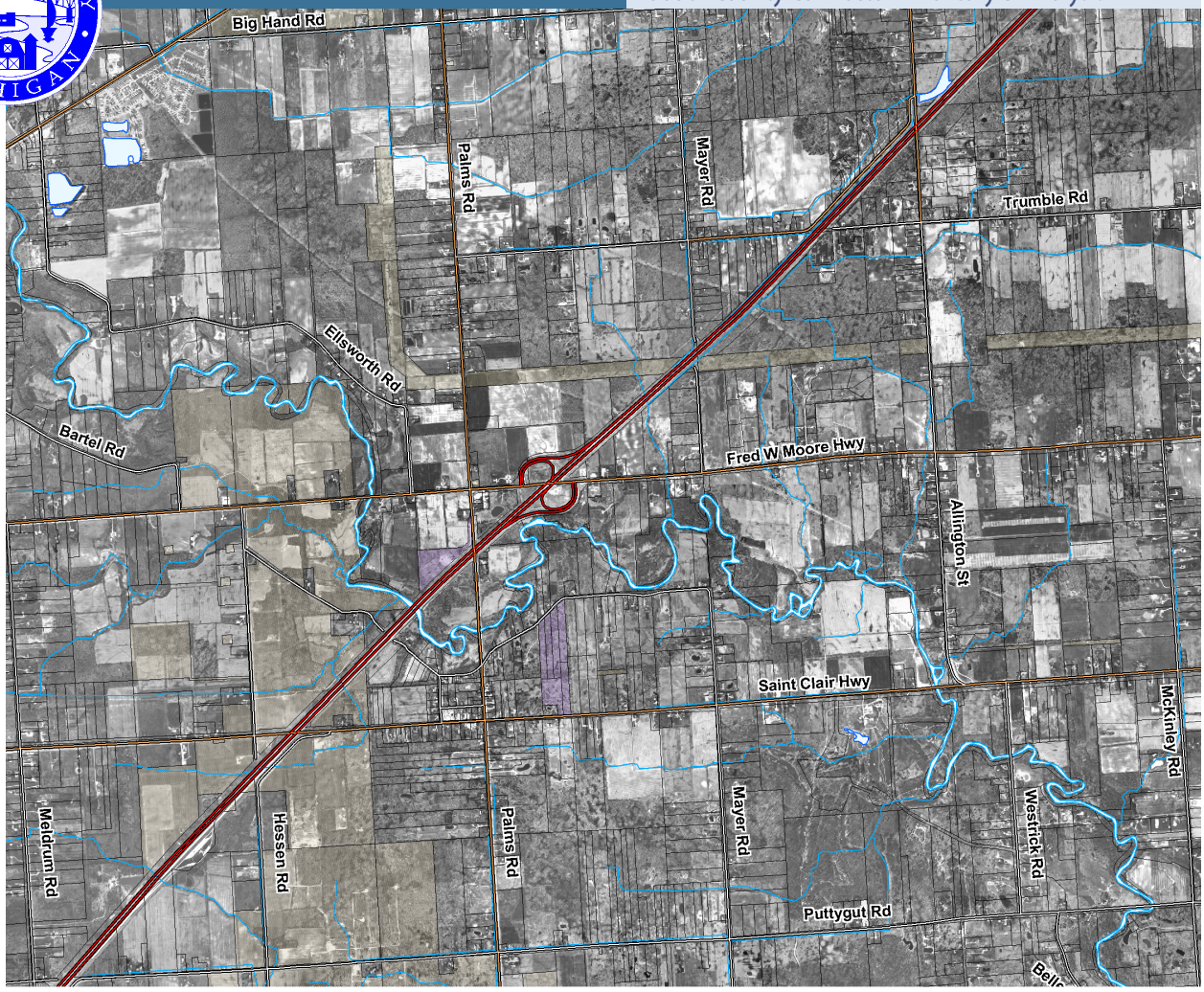
Property Ownership

South County Connector Inventory & Analysis



Adair Area Aerial Photograph and Parcel Map

South County Connector Inventory & Analysis

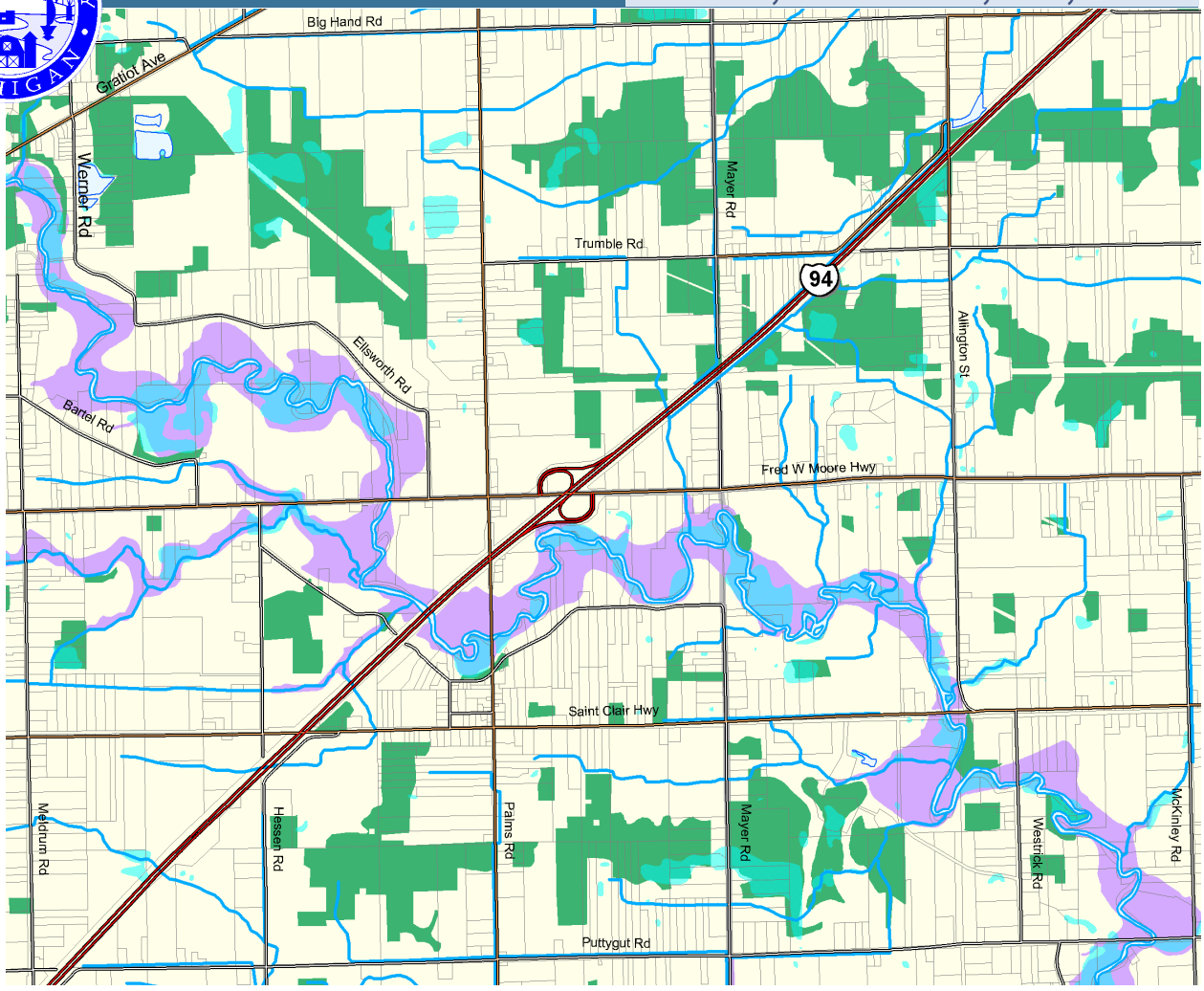


Legend:

- Property Lines
- Public Property
- CMS Property
- DTE Property

Adair Area Base Map

South County Connector Inventory & Analysis



Parcel Boundary

Wetland

Upland Forest

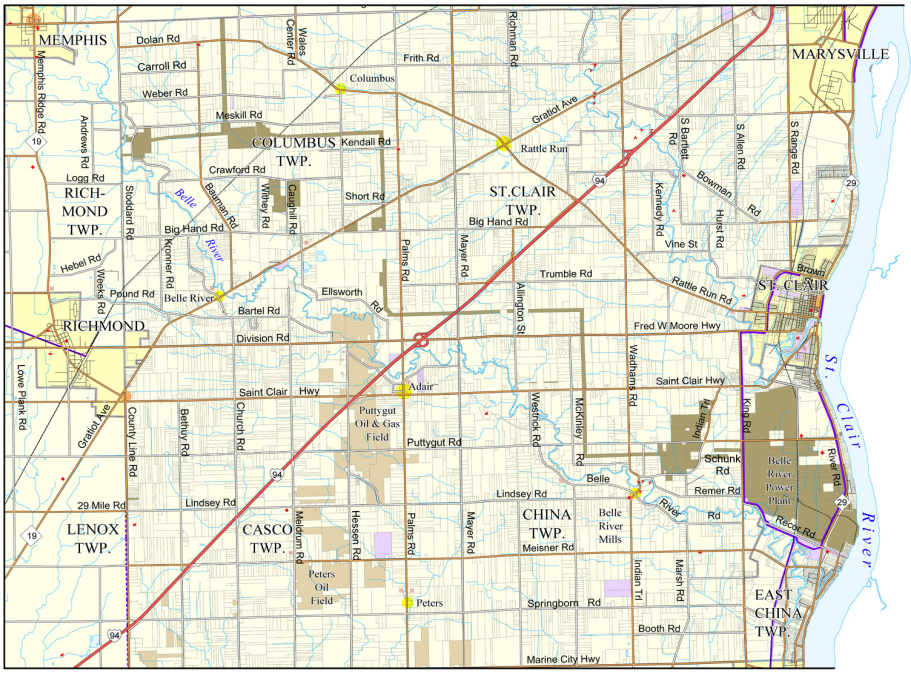
100 Year Floodplain

South County Connector Visioning Workshop

On Monday, May 19th, 2003 from 7:00 PM to 9:00 PM a Visioning Workshop was held at the China Township Hall. After a introductory presentation, participants where asked to list "special places" on worksheets and to draw potential routes on a large map that was provided for each table. The map is shown below and the results of the workshop are listed on the following pages.

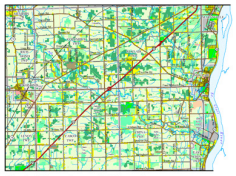
South County Connector Greenway Feasibility Study
Visioning Workshop
May 19, 2003

Table No. _____

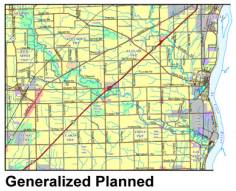


Project Area Overview

Land Ownership and Vacant Lands



Existing Land Use / Land Cover



Generalized Planned Land Use

South County Connector Visioning Workshop Results

Summary of Public Input
Monday May 19th, 2003 from 7:00 PM to 9:00 PM
China Township Hall

Special Places

In general, farmland, rural roads, woodlots, and the river itself along the Belle River corridor were all identified numerous times by individuals as areas encouraged for inclusion in the route and as amenities of the county. Individual responses about the special places in South County can be grouped into several general areas or destination hubs. These areas are highlighted on the Public Input Special Places Map. They include the area of the Belle River Corridor along Columbus Township Park. The park was marked on all four of the groups' maps. Other destinations in this region that were mentioned included the Gratiot Road corridor, Crockett's Restaurant, and the Richmond Sportsman's Club.

Numerous people mentioned the central Adair corridor as a cultural and historic highlight along the Belle River. The Highway 94 overpass of the Belle River was mentioned as a strategic and safe crossing point for the future greenway by several groups. The east side of Hessen Road, the village of Adair, the Dart property and the canoe access point east of the Dart property were all mentioned as notable destinations within this area .

Three different tables noted the Radicke Mill and old bridge at Indian Trail Road for its scenic views and historical significance. The Belle River ravine and Section 6 to the west of the bridge were both noted by two tables as well.

The China Township property at the intersection of King Road and the Belle River was marked on the map by three different groups. Other noted destinations in this area include the Belle River Power Plant and the canoe access along Recor Road.

Connector Routes

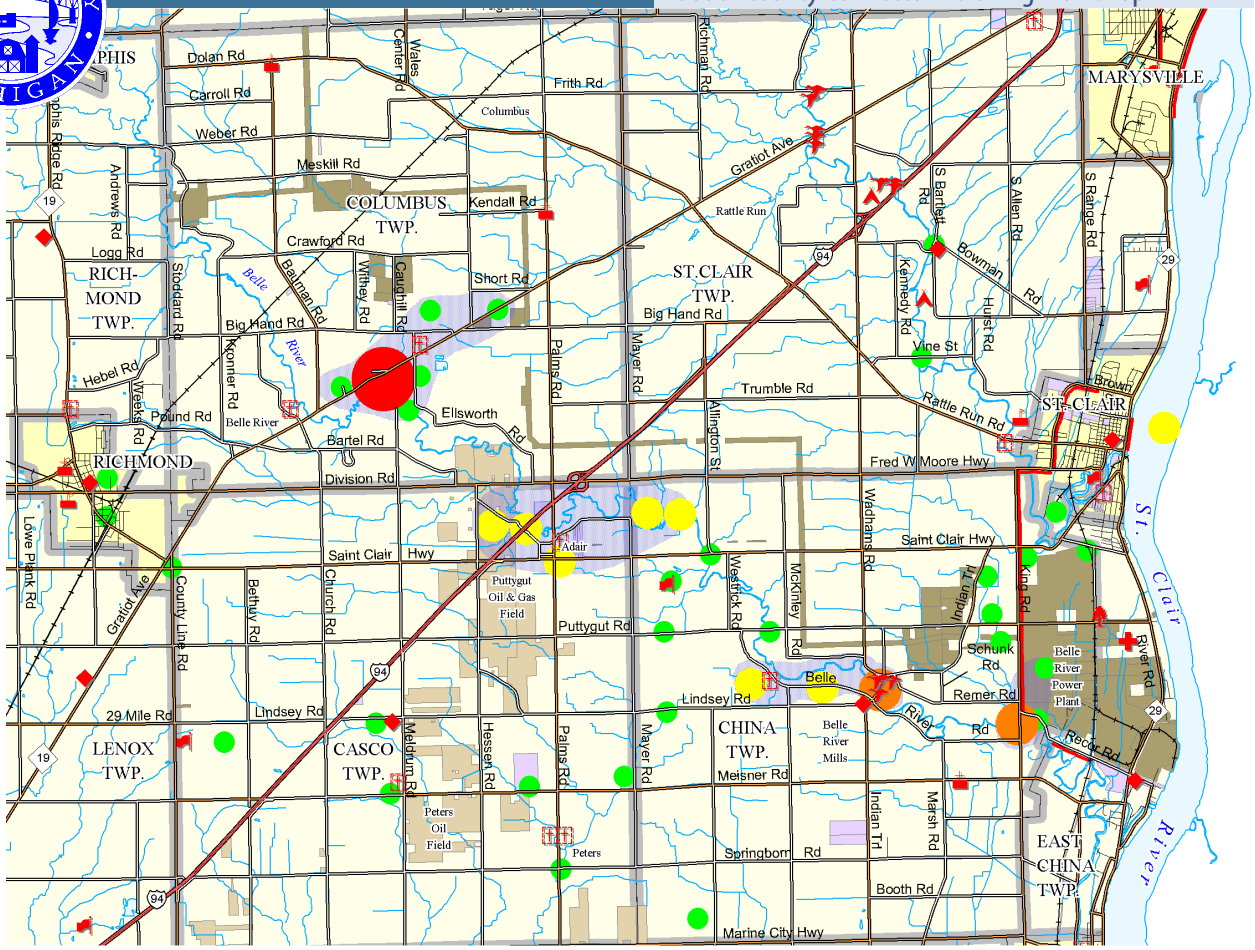
The responses of the group indicated a strong sentiment to expand the system of non-motorized facilities in the township, including off-road pedestrian and bike trails, horse trails, and on-road bike facilities. From the routes marked on the group maps, several areas of focus emerged. The most frequently mentioned opportunities were 1) a connection under the I-94 overpass over the Belle River and 2) a route east of Richmond along Division Road and along Gratiot Road. These areas were noted by all four groups.

Three out of the four groups outlined a route directly adjacent to the Belle River, east of Adair, through what is currently the Dart property. Three out of the four groups also indicated the Gratiot Road corridor connecting Columbus Township Park and the Belle River corridor near the intersection of Bauman and Gratiot as preferable routes.

A direct, on-road linkage along Fred Moore Highway was indicated by two groups. Back-roads scenic bikeway routes were indicated along Westrick Road, Belle River Road and Remer Road by two out of the four groups.

Public Input Special Place Input Summary

South County Connector Visioning Workshop



Special Places Public Input:

- Mentioned Once
- Mentioned Twice
- Mentioned Three Times
- Mentioned Four Times
- Concentrations of Special Places

Public workshop participants were asked to choose several of their special places to visit along the Belle River corridor. Bridges, mills, farmland, and forests along the entire corridor were chosen for recreational opportunities, wildlife protection, scenic views and cultural significance. Specific areas highlighted by several of the workshop groups have been noted on the map in blue.

The Gratiot Road corridor and Columbus Township Park area was highlighted by numerous participants for its recreational and scenic amenities. Adair village and the surrounding area was also noted as a prominent cultural amenity along the river corridor. The Radicke Mill, Indian Trail bridge, and the China township property along King Road were other frequently mentioned sites.

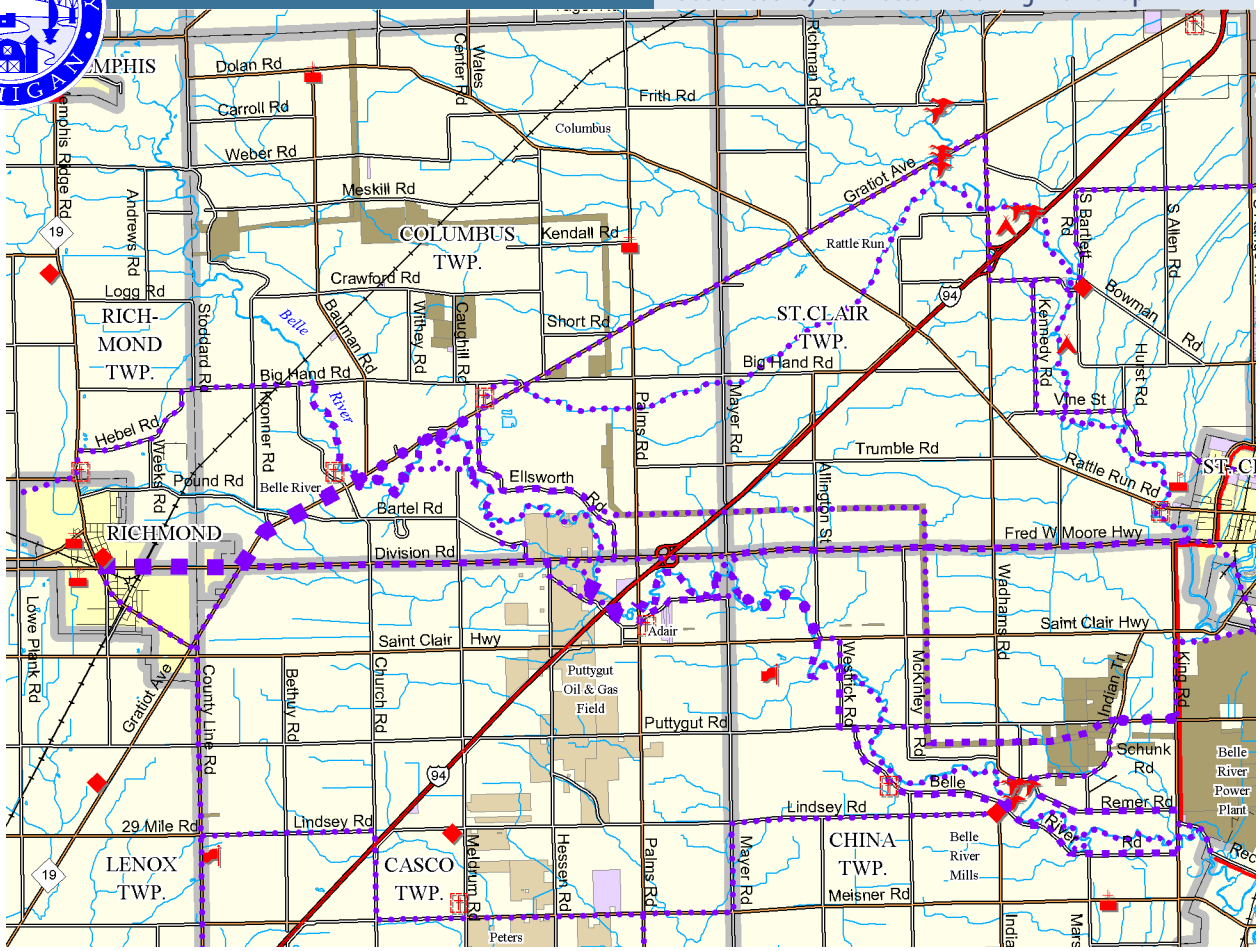
Recorder Worksheets
Summary of group worksheets

Special place	Description (historic, cultural, natural, scenic, etc.)	# of times mentioned
Columbus Twp. Park along Gratiot	Natural, scenic	5
Belle River corridor	Scenic, historic, floodplains, accessible without car	5
Adair	Historic commercial district	3
St. John's Marsh Refuge	Environmental, scenic	3
Marine City Swimming Beach	Access to water	2
Indian River Bridge	Historic bridge and mill	2
Belle River at:		
1. I-94 overpass	Strategic, safe, scenic crossing	2
2. Property at Recor and King, SE corner		2
3. Puttygut Road	Scenic, hills	1
4. Adair Road at the end of Adair	Woods, river	1
5. E.side of Hesson Road	Woods, river	1
6. Belle River Road ravine	Steep river, cemetery	1
7. China Twp. property on river		1
Gratiot Corridor	Historic	1
Harsen's Island	Natural, scenic	1
Smith's Creek	Historic	1
St. Clair Boat Harbor and boardwalk	Scenic, cultural	1
St. Jane's Church at Meldram and Meisner	Architecture, culture	1
Church at Palms and Springer	Architecture and Culture	1
Golden Hawk Golf Course	Scenic, recreation	1
Rattle Run Golf Course	Scenic, recreation	1
Michigan Meadows Golf Course	Scenic, recreation	1
Belle River Dam	Historic	1
Casco Twp. Park	Scenic, undeveloped	1
Richmond Sportsman's Club	Recreation	1
Perch Point Club	Recreation	1
Fred Meiselbach Park	Scenic, cultural	1
Emil the Buffalo	Cultural, historic	1
Wills St. Clair Auto Museum	Historic	1
Grain elevator in Richmond	Historic, commercial building	1
Crockett's Restaurant		1
WaRoad's Hill at Meskill and Kronner	Natural valley	1
Unpaved roads in agricultural lands		1

St. Clair Edison Plant	Impressive power plant	1
Algonac State Park	Natural, river views	1
Algonac Waterfront Park	Scenic	1
Ferry links to flats	Scenic islands and flats	1
Russell Island	Scenic	1
China Twp. Section 6	Scenic-canoeing, kayaking	1
China Twp. Section 17	Scenic-canoeing, kayaking	1
Radicke Mills	Scenic views	1
Railroad route (Bree Road)	Wooded, natural, scenic	1
St. Clair River	Views, shipping	1
Pine River	Scenic, recreation	1
Allington Road and St. Clair Highway	Bridge	1
Muttonville Area	Shopping, eating	1
Marine City, Catholic Pt.		1
Bridges along Belle River		1
Property at W. Pine in St. Clair (China Twp.)		1
Pine River Elementary School Nature Trail		1
Cemeteries in general		1
Horse farms in general		1
Becke Park		1
Quasnic Farm at Staiville and 26 Mile Road		1
Dart Farm		1

Potential Routes Public Input Summary

South County Connector Visioning Workshop



Potential Routes Public Input:

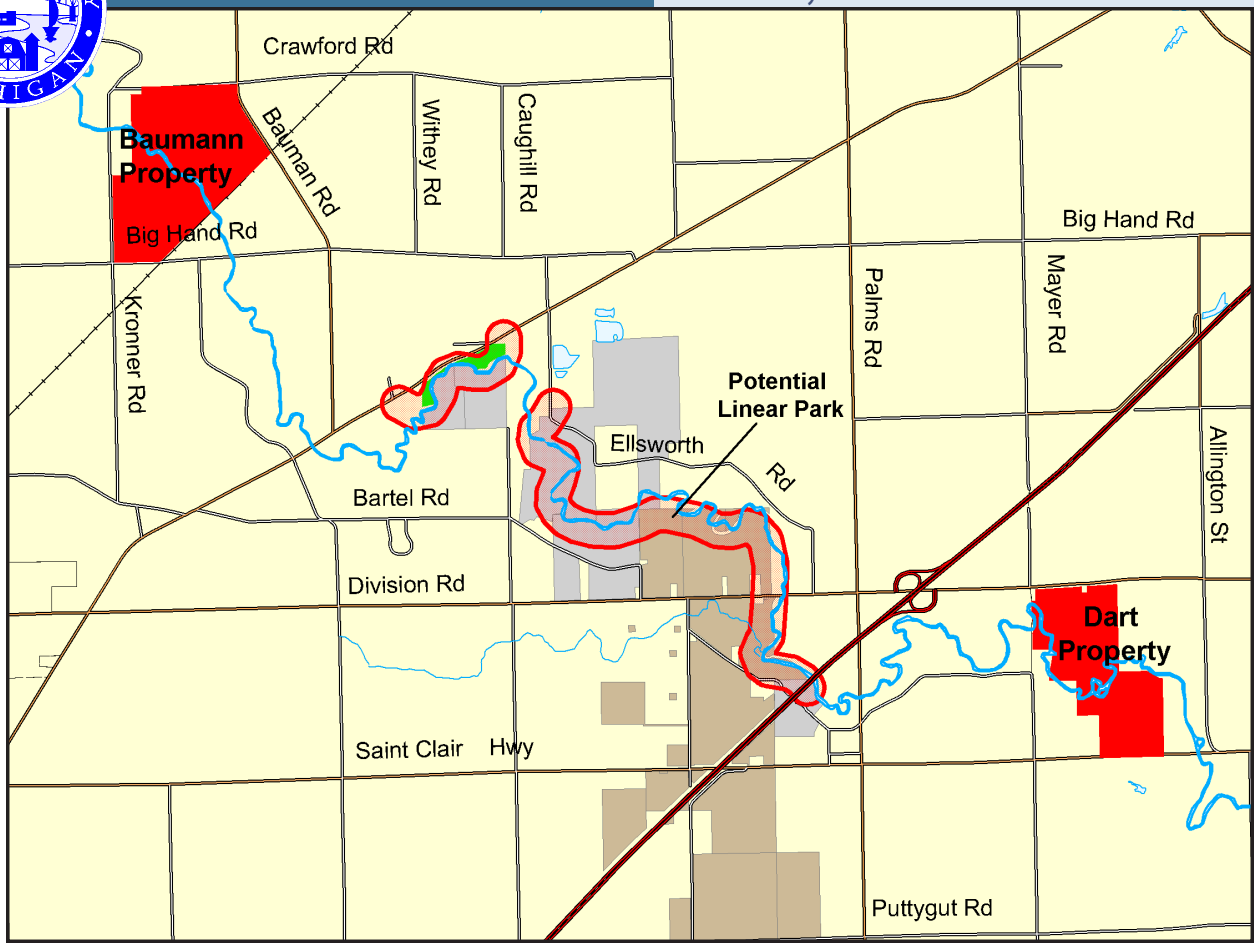
- Mentioned Once
- Mentioned Twice
- Mentioned Three Times
- Mentioned Four Times

Workshop participants were asked to discuss the different routes available for traveling between the special places they had identified and draw the routes on their group maps. This map is a summary of routes identified during the workshop. Suggestions included backroad bikeways, horse trails, pedestrian paths along the river, and bike facilities along major road corridors.

The route under the I-94 overpass of the Belle River was identified by all four groups as being a possible solution to crossing the major obstacle of the interstate. The Gratiot Road and Division Road corridors were identified as important links to the town of Richmond at the western end of the greenway.

Park Site Alternatives

South County Park Alternatives



Legend

- Large property owners adjacent to the river
- Potential linear park
- CMS Property
- Public Park

Three park alternatives are emerged from the feasibility study: the Dart property, the Baumann property, and a linear park connecting to the existing Columbus Township Park.

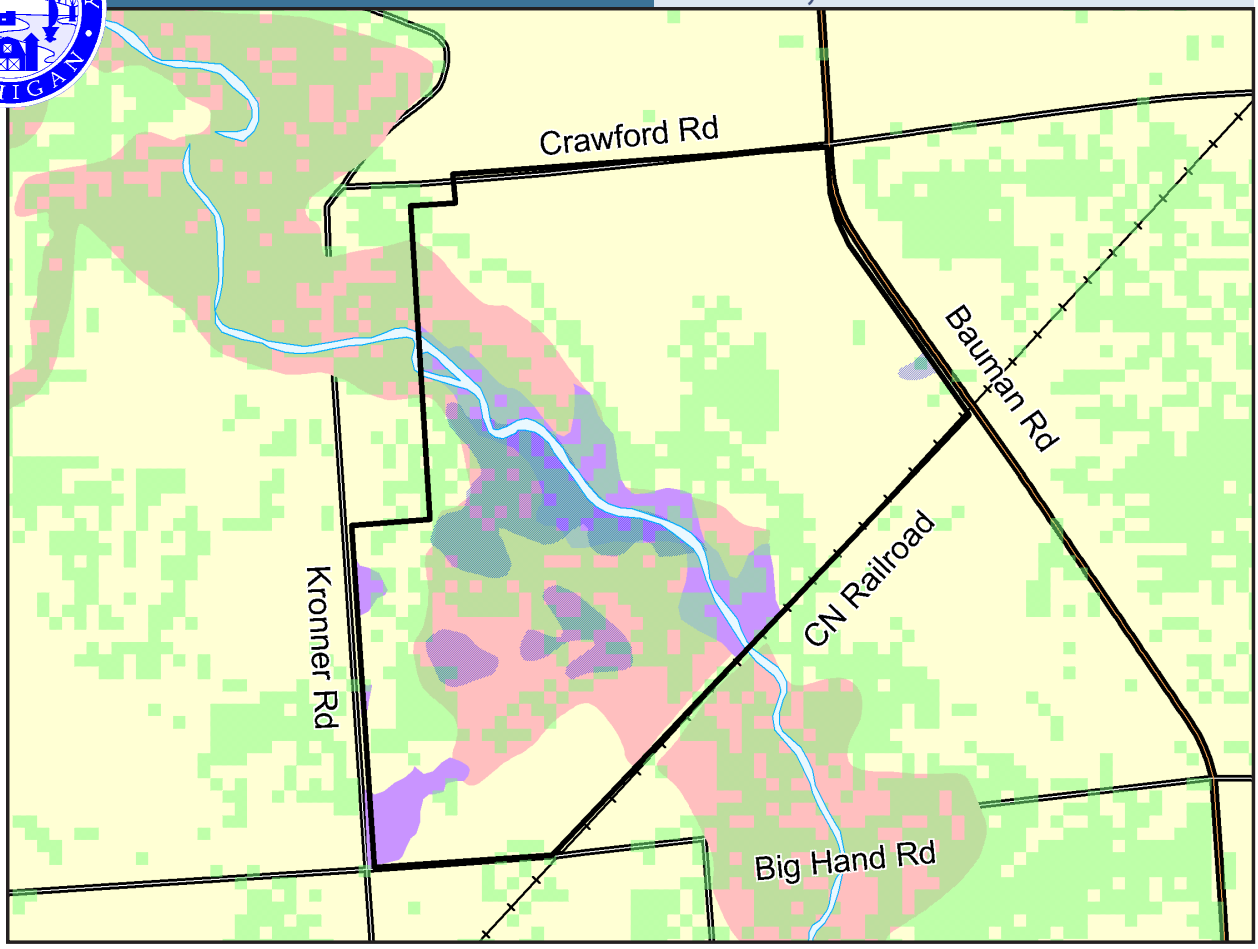
The Dart property is a 300 acre parcel with nearly a mile of river frontage on one or both sides. It is very centrally located in the county and near the small village of Adair. Results from the Public Alternatives workshop showed that out of the three park location alternatives, this was the most preferred.

The potential linear park would be a nearly 5 mile stretch of river frontage created from easements of 3 private land owners, one public utility and MDOT. This was the second most preferred option for a park location.

The Baumann property is a 416 acre parcel with over 3/4 mile river frontage where both sides of the river corridor are owned. It is in the western portion of the county, and 6 miles from the city of Richmond, therefore, a significant draw on the park would likely be from Macomb County residents. Public input showed it was the least preferred option for a park location.

Baumann Property Site Analysis

South County Connector Park Alternatives



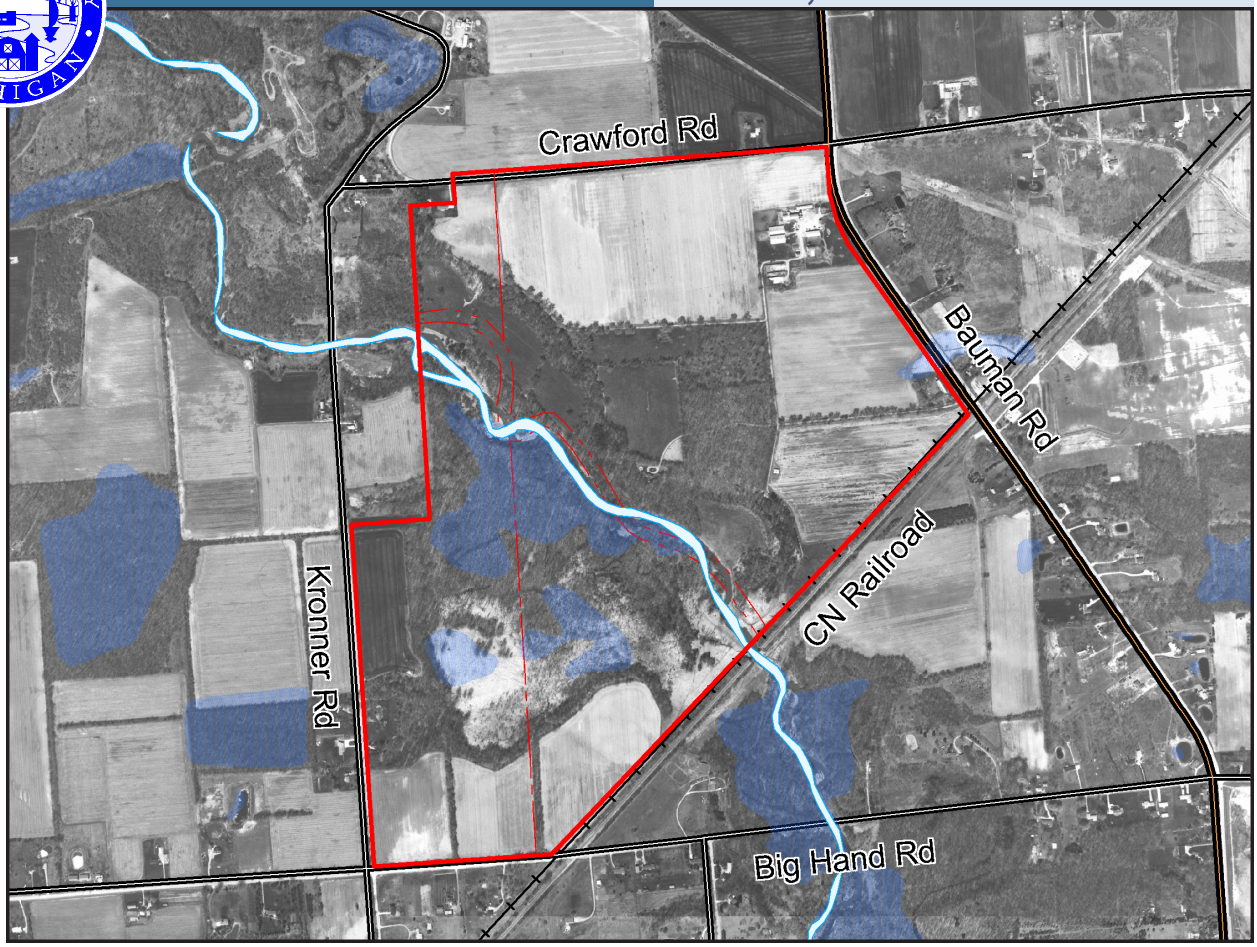
Legend

- Wetlands
- Wooded areas
- Hydric Soils
- 100-year floodplain
- Property Boundaries

Total:	416 acres
Forested Acres:	132.1 acres
Wetland:	40.3 acres
Shrubland:	20.6 acres
Farmland and Herbaceous Cover)	241.6 acres
River segment:	.77 mile (both sides owned)
Hydric Soil:	50.7 acres
Elevation Change:	55 feet

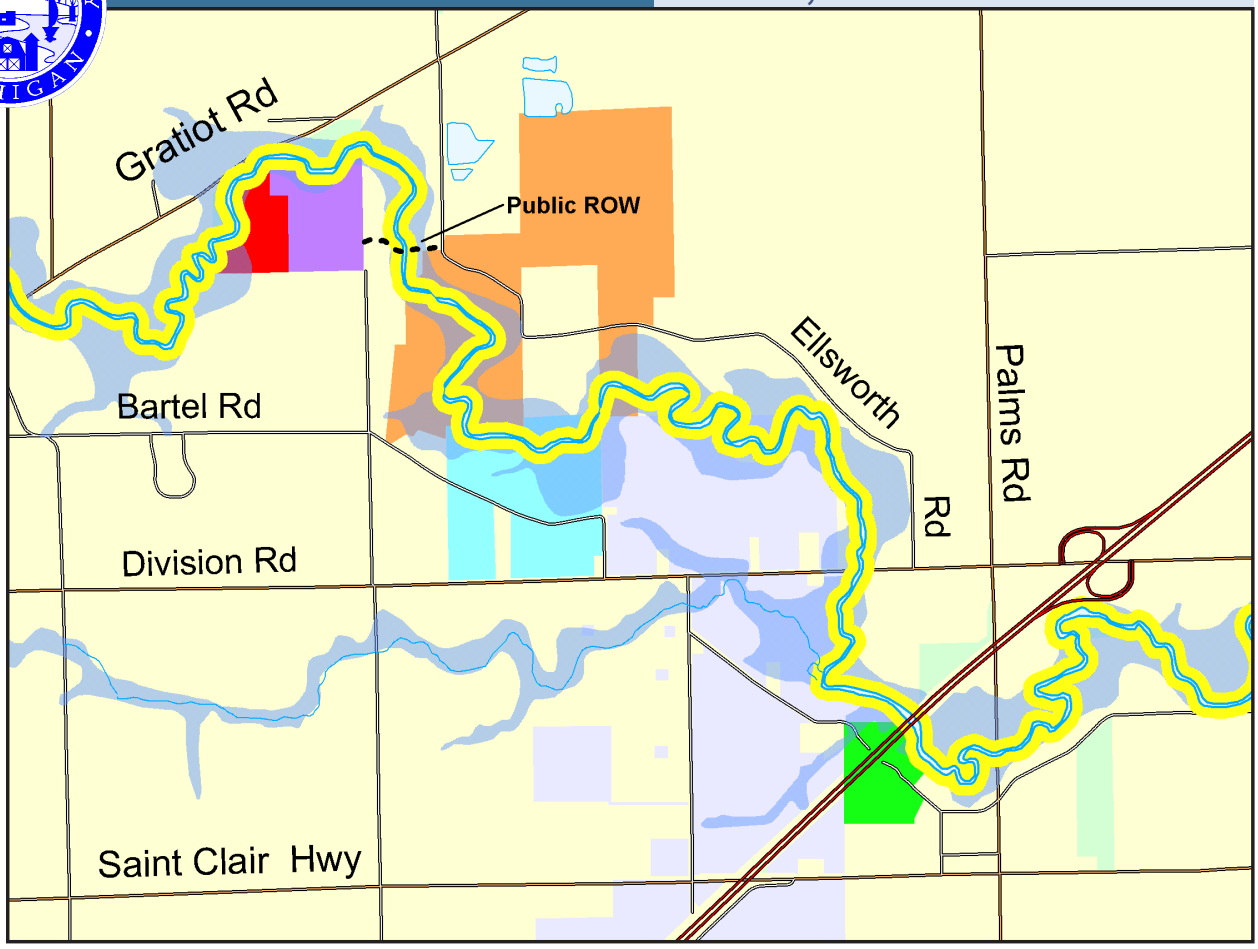
Baumann Property
Air Photo

South County Connector Park Alternatives



Linear Park Site Analysis

South County Connector Park Alternatives



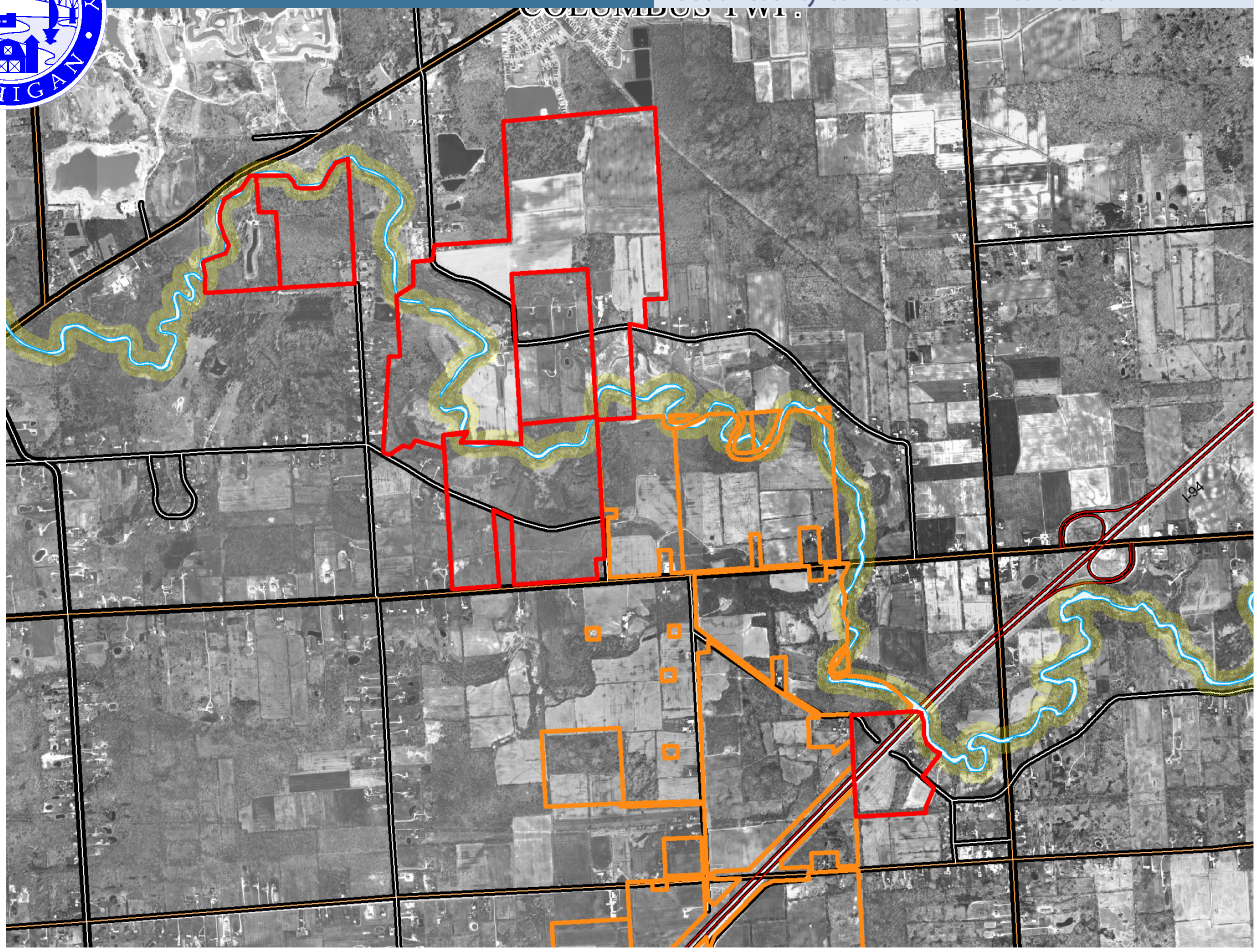
Legend

- 200 ft. river buffer (potential easement size)
- 100 year floodplain
- CMS property
- Public Property

	Total Size	River Frontage	Land Use
	40.1 acres	0.17 miles (one side)	Residential
	37.6 acres	0.49 miles (one side)	Residential
	145.5 acres	0.21 miles (one side) 0.32 (both sides)	Vacant
	61.5 acres	0.36 miles (one side)	Portion Vacant
	367.6 acres	1 mile (both sides)	Portion Vacant

Linear Park
Air Photo

South County Connector Park Alternatives

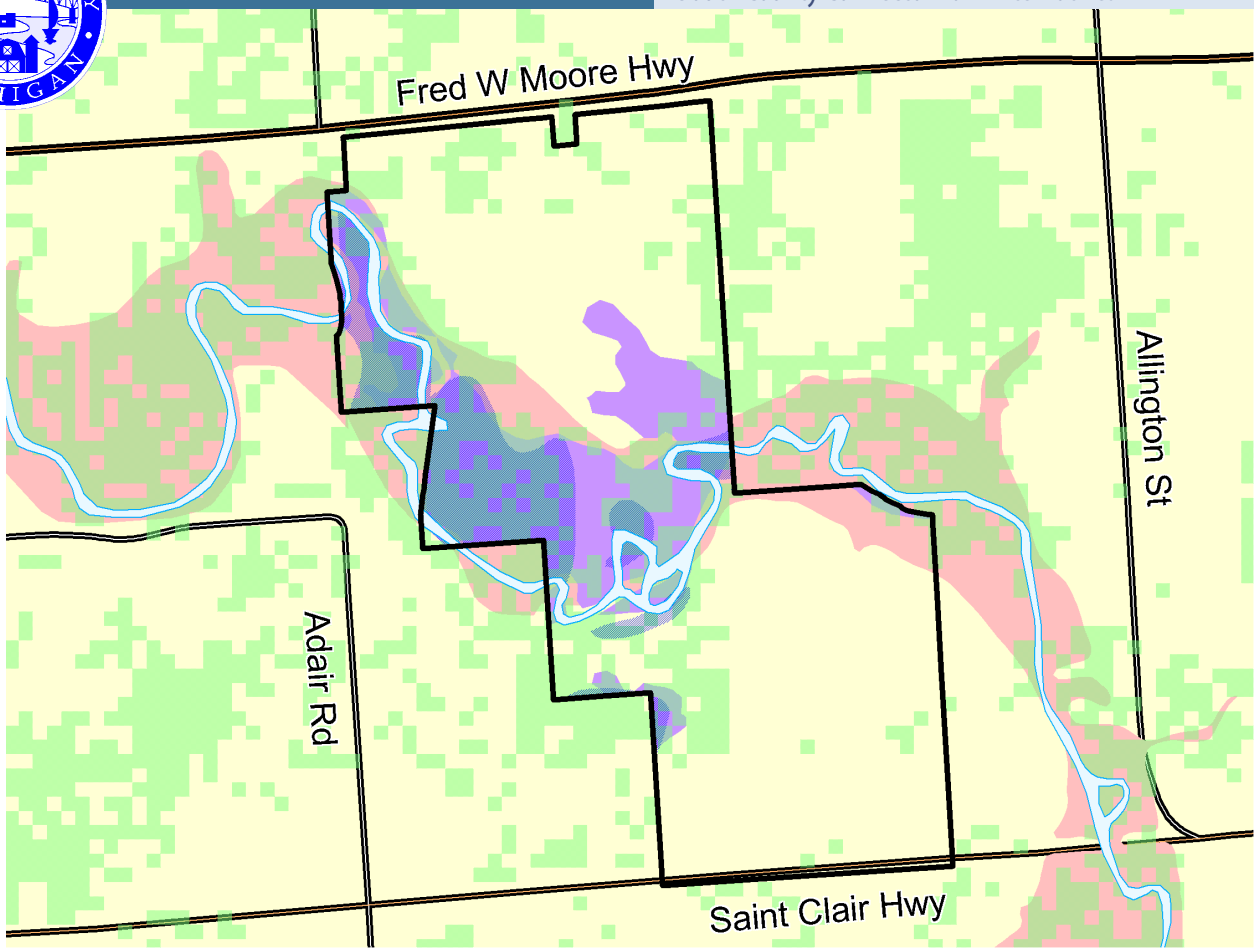


Legend

- Large property owners
- CMS Property
- 200 ft. river buffer

Dart Property Analysis

South County Connector Park Alternatives



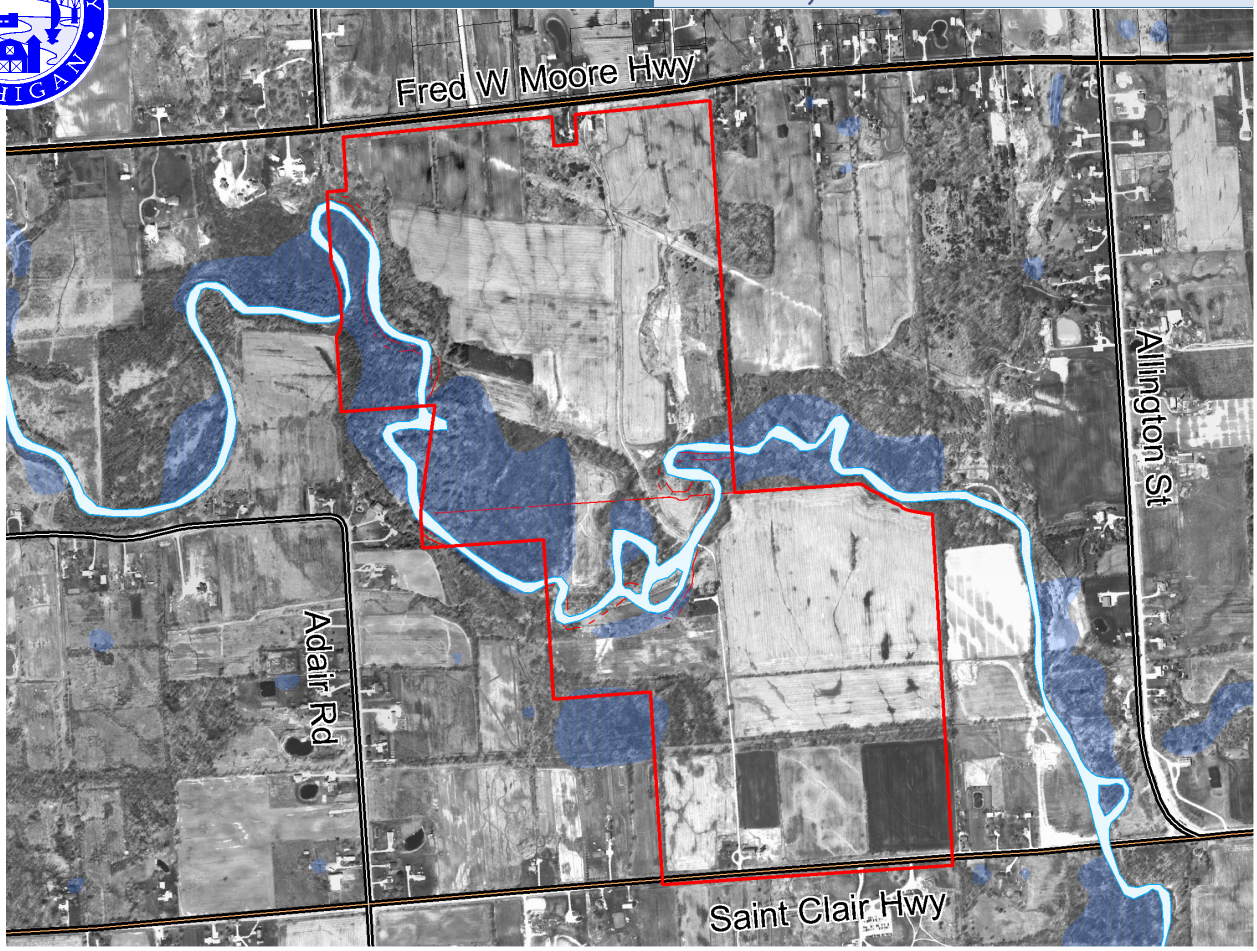
Legend

- Wetlands
- Wooded areas
- Hydric Soils
- 100-year floodplain
- Property Boundaries

Total:	300 acres
Forested Acres:	80.1 acres
Wetland:	39.8 acres
Shrubland:	20.6 acres
Farmland and Herbaceous Cover)	177.1 acres
River segment:	0.77 mile (both sides owned) 0.13 (one side owned)
Hydric Soil:	66.4 acres
Elevation Change:	35 feet

Dart Property
Air Photo

South County Connector Park Alternatives

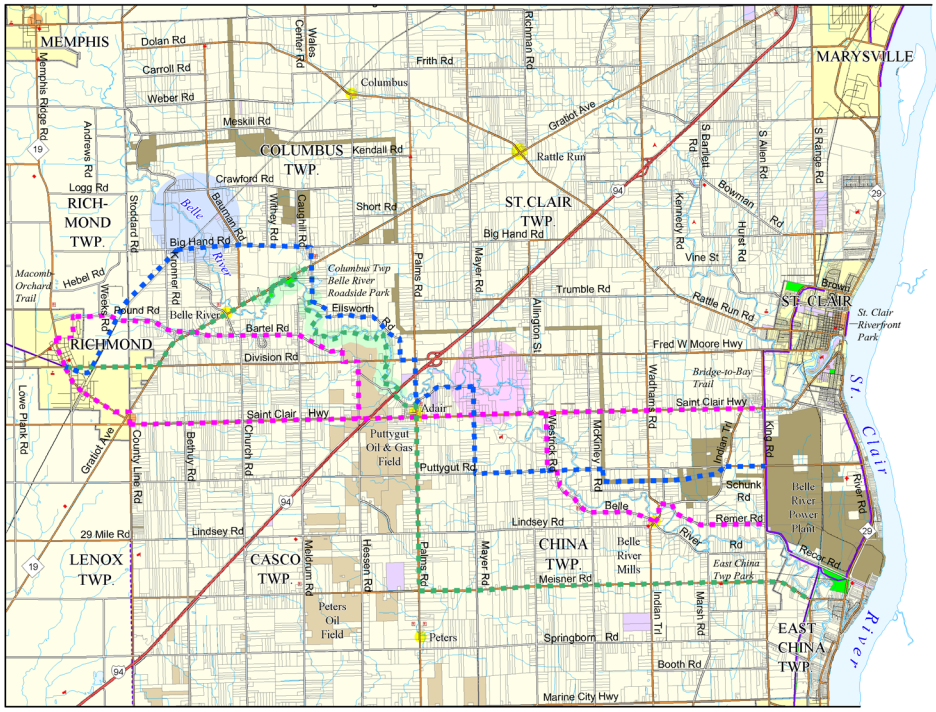


South County Connector Alternatives Workshop

On Monday, July 21, 2003 a workshop was held at the China Township Hall from 7:00 PM to 9:00 PM. Participants where asked to review the maps at their table (shown below). They where asked to identify a preferred park location and a route that they feel was the most desirable and/or the most feasible to connect the park to Richmond and St. Clair. They where encourage to mix and match the solutions. For example, Park A does not have to be exclusively matched with Route A. It may include portions of Alt. Routes B and C.

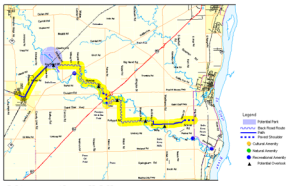
Participants where encouraged to elaborate on the reasons for their choice of parks and routes on worksheets. The responses from the worksheets are summarized next to each alternative.

South County Connector Greenway Feasibility Study
Alternatives Workshop
July 21, 2003



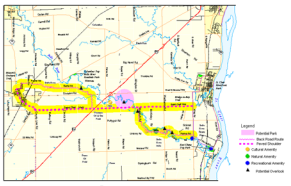
Alternatives Worksheet

Table No. _____



Alternative "A" Overview

Alternative "B" Overview

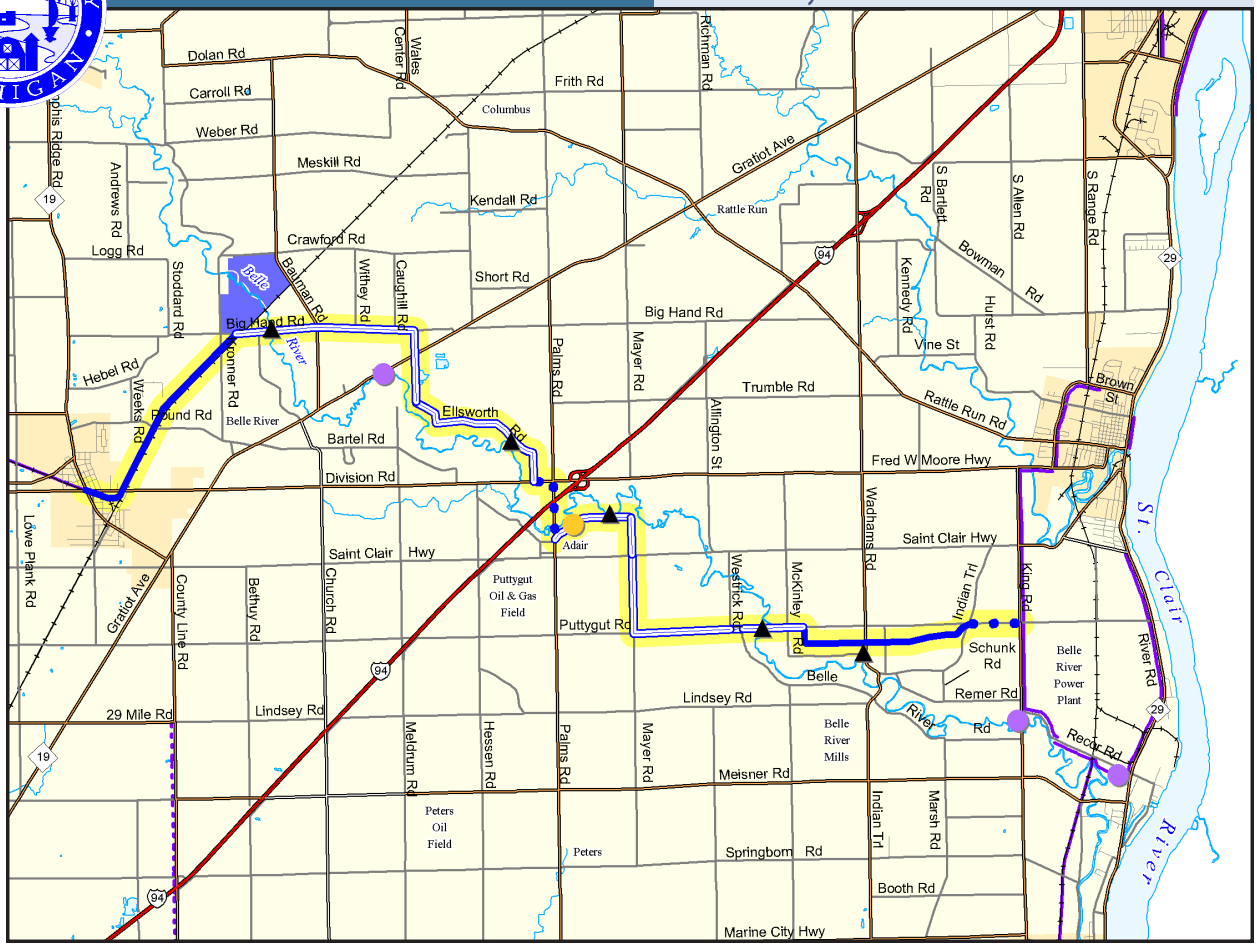


Alternative "C" Overview

The Greenway Collaborative, Inc.
Greenways, Trail, Open Space, and Non-motorized Planning

Alternative A: North Park

South County Connector Route Alternatives



Legend

- Overlook Opportunity
- Cultural Amenity
- Natural Amenity
- Recreational Amenity
- Back Road Route
- Path
- Paved Shoulder
- Existing Trail
- Planned Trail
- Proposed Park Location

Alternative Route A is designed to link to the Baumann property and provide a direct route between Richmond and the northern park. The route includes 3 miles along the existing railroad, 12 miles of back roads routes, and 2.4 miles of shard-use path along the utility easement. The route crosses I-94 on the Palms Road overpass.

The feasibility of this route with its reliance on working with the railroad and utility companies is difficult. However, one advantage of the route is that it is away from the major roadways for long stretches.

Alternative A: North Park

Park Location

Ranking 1 2 3 X X

Why did your group give the park location this ranking? Please comment on the feasibility or desirability of this park location.

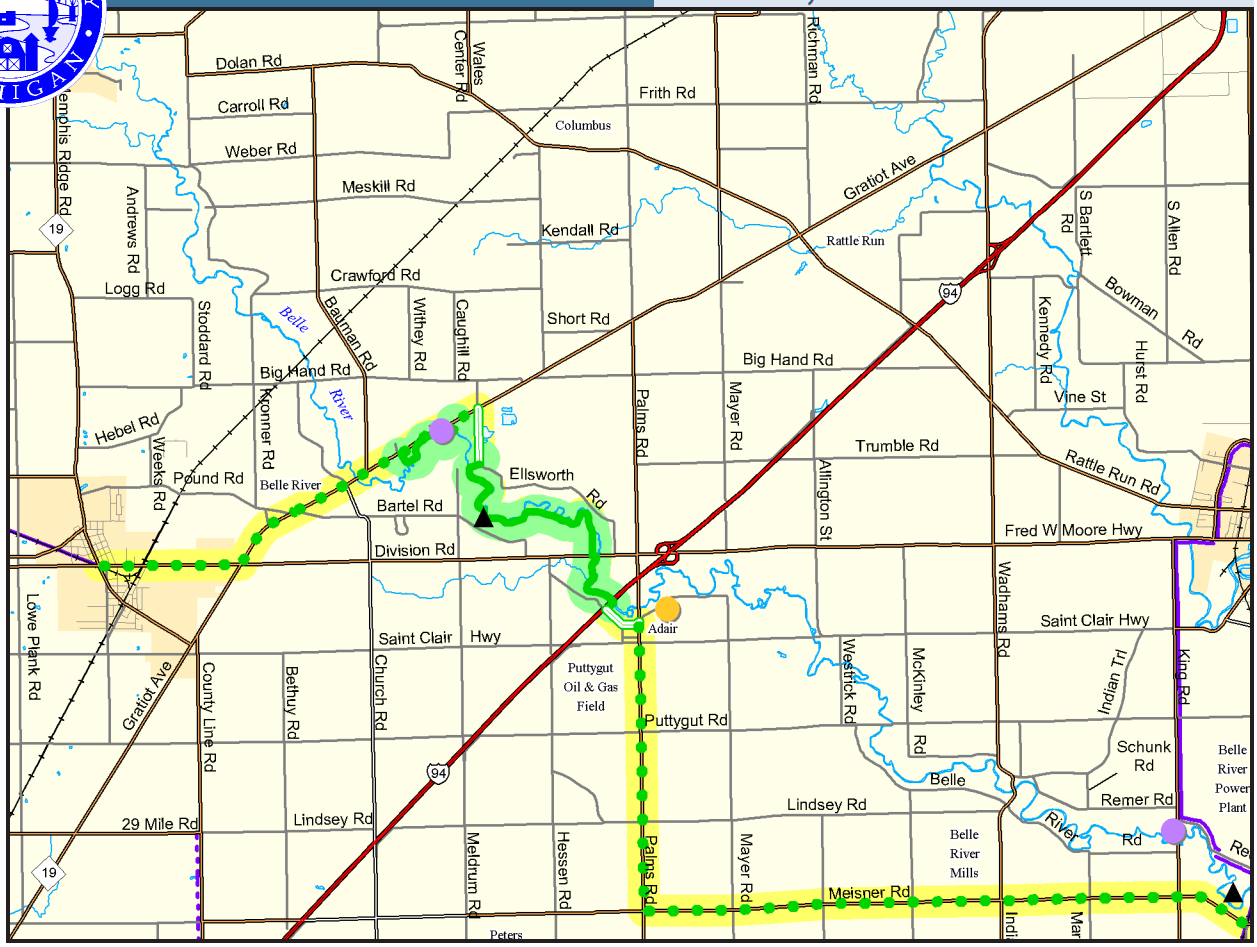
(3) Not centrally located. Not as good as C.

Greenway Routes
Please comment on the specific sections of this route including the desirability, feasibility and amenities encountered along the route.

Route Section	**Type**	**Yes or No?** **Comments**
Along the CSX Railroad ROW to Kronner Road	Off-road Path	No- Trains are a potential problem Yes- Railroad gets you thru Richmond with less trouble
Big Hand and Ellsworth Road to Division Road	Back Roads Route	Prefer to stay off Division but use if flooded Yes- No cost
Cross over I-94 on Palms Road	Paved Shoulder	Yes/no- If a trail under I-94 is flooded, use Palms Overpass Yes
Adair Road to McKinley Road	Back Roads Route	Adair Rd to Mayer to Puttygut- stay off St. Clair (busy) Yes- No cost Yes- Needs to be kept better and improved for cycle use
Overland through DTE corridor: McKinley Road to Schunk Road	Off-road Path	No- costly
Indian Trail to King Road	Paved Shoulder	No- costly

Alternative B: Linear Park

South County Connector Route Alternatives



Legend

- Overlook Opportunity
- Cultural Amenity
- Recreational Amenity
- Back Road Route
- Path
- Paved Shoulder
- Existing Trail
- Planned Trail
- Proposed Linear Park

Alternative Route B is designed around the idea of the linear park created from easements of three private land owners, MDOT and the utility property. The route leaves Richmond along a paved shoulder of the major road corridors of Division and Gratiot. It includes a paved shoulder route for 4 miles on these high volume roadways and 10 miles of paved shoulder on moderate volume roadways of Meisner and Palms Roads. These busy roads may intimidate novice bike users because of their high volumes of fast moving traffic. The route also relies on the cooperation of land owners along the river, which may be difficult to establish. The route crosses I-94 at the underpass of the Belle River.

Alternative B: Linear Park

Park Location

Ranking 1 X 2 X 3

Why did your group give the park location this ranking? Please comment on the feasibility or desirability of this park location.

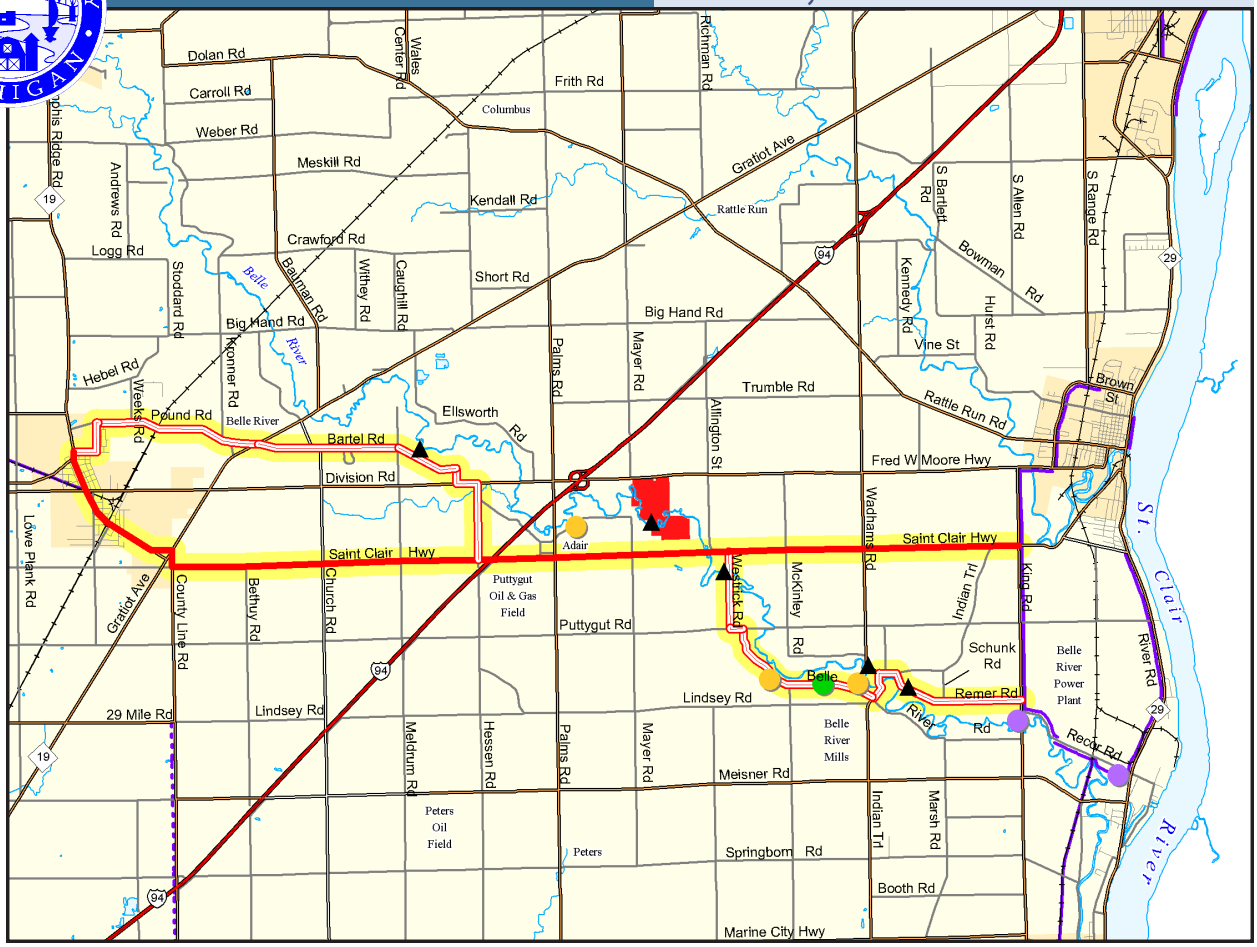
(2) Natural Beauty

Greenway Routes
Please comment on the specific sections of this route including the desirability, feasibility and amenities encountered along the route.

Route Section	**Type**	**Yes or No?** **Comments**
Gratiot Road: Division Road to Columbus Township Park	Paved Shoulder	No- Stay off high use roads No- Costly
Overland route along Belle River through the new park	Off-road Path	Yes- very scenic and peaceful Yes- Natural Beauty
Cross under I-94 at Belle River	Off-road Path	Yes- when not flooded No- Costly with flooding
Palms Road: Adair Road to Meisner	Paved Shoulder	No- Costly
Meisner Road: Palms Road to King Road	Paved Shoulder	No- costly

Alternative C: Central Park

South County Connector Route Alternatives



Legend

- Overlook Opportunity
- Cultural Amenity
- Natural Amenity
- Recreational Amenity
- Back Road Route
- Paved Shoulder
- Existing Trail
- Planned Trail
- Proposed Park Location

Alternative Route C is designed to connect to the Dart property park. It includes a 13 mile "straight shot" along the St. Clair Highway, or an alternative 13 mile back road route that includes only 3 miles along the St. Clair Highway. Both options cross I-94 at the St. Clair Hwy. overpass. While the back roads routes can highlight many scenic areas in the county, they are virtually impassible during the spring and long stretches of gravel road can be difficult for novice bikers.

Alternative C: Central Park

Park Location

Ranking 1 XX 2 X 3

Why did your group give the park location this ranking? Please comment on the feasibility or desirability of this park location.

1- Because of location. Central, equal accessible for population. Near access to store. Natural beauty.

1- Relatively central, property potentially available. Route (E to W)- St. Clair Highway should be dedicated bike lane to Mayer, thru park to Adair, under I-94 along river, jumping off onto Bartel, then Gratiot-Division into Richmond, up side street to Beebe Park then west on side st. to Macomb Orchard Trail

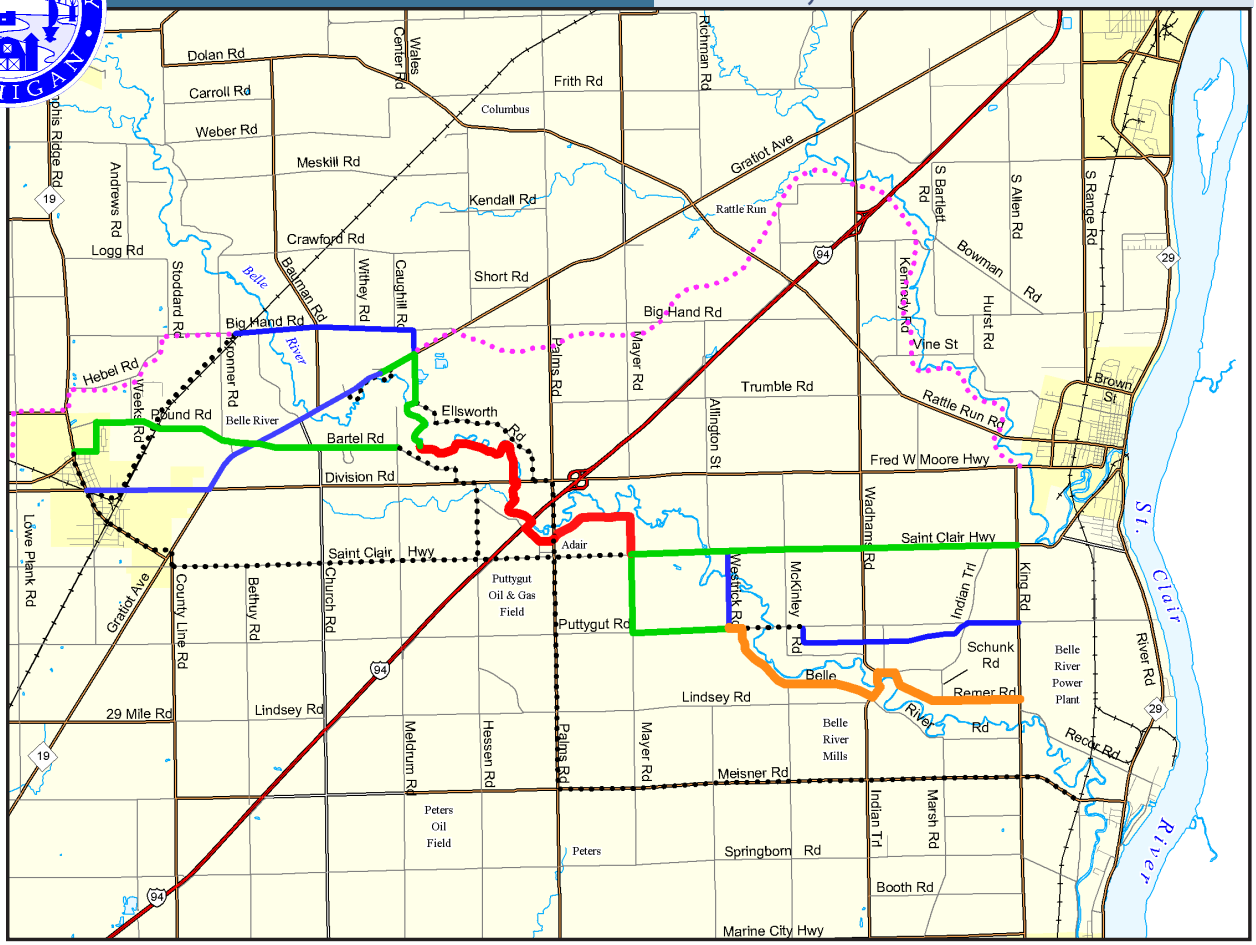
Greenway Routes

Please comment on the specific sections of this route including the desirability, feasibility and amenities encountered along the route.

Route Section	**Type**	**Yes or No?** **Comments**
St. Clair Highway: Richmond to St. Clair	Paved Shoulder	No- too busy No- Dangerous Yes- from park east, dedicated bike lane
Pound Road to Banal Road to Hessen Road	Back Roads Route	Yes- not costly
Cross over I-94 at St. Clair Highway	Paved Shoulder	No- not wide enough
Westrick Road to Belle River Road to Indian Trail Bridge	Back Roads Route	Yes- not costly
Remer Road from Indian Trail Bridge to King Road	Back Roads Route	Yes- not costly

Alternative Workshop Results

South County Connector Route Alternatives



Legend

- Added route
- Not mentioned
- Mentioned 1 time
- Mentioned 2 times
- Mentioned 3 times
- Mentioned 4 times

Workshop participants were asked to highlight their preferred route or combination of routes from Alternatives A, B, and C. The map shows the number of times each route segment was chosen as most preferred route. In addition, the map shows routes that were added by workshop participants.

Although the Dart property was chosen as the most preferred *park location*, the results show that pursuing the easement options along the river and under the 94-overpass was the most preferred *greenway route* for the central part of the greenway. Back roads routes along Belle River Road or Bartel Road were also preferred.

Wadhams Road / Trail Crossing Alternatives

December 15, 2006

The Wadhams-to-Avoca Trail currently intersects Wadhams Road just north of the Wadhams Road / I-69 interchange. There are currently no crosswalks in place. The Wadhams-to-Avoca Trail extends 9.5 miles to the northwest and 2.5 miles to the southeast and is planned to extend an additional 4 miles east to connect to the Bridge-to-Bay Trail. The trail has been identified as having regional significance as part of a recent regional trail planning process. Increasing use of the recently paved segment to the southeast puts additional pressure to resolve this trail / road intersection quickly.

Wadhams Road is under the jurisdiction of the St. Clair County Road Commission. The trail corridor crosses Wadhams Road just north of the I-69 interchange. Immediately north of the trail corridor and continuing ¼ mile north to Lapeer Road is a commercial district with numerous curb cuts.

A preliminary examination of the alternatives revealed that there are three general route alternatives and many potential crossing variations within each route alternative. Thus three general route alternatives are discussed separate from the crossing options within each route alternative.

Alternative Routes

Alternative Route 1 (shown in red) – starting at the west, it heads north from the railroad right-of-way going behind businesses to Lapeer Road where it runs parallel to Lapeer Road crossing 2 residential and 9 commercial driveways of which 5 are wide high volume driveways. It crosses Wadhams Road at the traffic signal (no pedestrian signal currently exists) and then heads south along Stable Drive and through undeveloped property to the trail. There are various alignment options that follow this same general concept.

Alternative Route 2 (shown in green) – follows the existing railroad right-of-way and crosses Wadhams Road between the existing traffic signals at Lapeer Road and the I-69 Ramp.

Alternative Route 3 (shown in blue) – starting at the west, it veers southeast from the railroad right-of-way through undeveloped property and crosses Wadhams Road at the existing traffic signal at the freeway entrance and exit ramps. It then continues easterly along the edge of a brownfield site and then rejoins the railroad right-of-way. There are various alignment options that follow this same general concept.

Figure 1 – Route Alternatives, illustrates the three alternatives.

Alternative Route Evaluation

The following evaluation factors were used to evaluate the Alternative Routes:

- **Out-of-Direction Travel** – how far and to what degree the trail user must veer from the most direct route.
- **Quality of Experience** – what will be the perceived quality of the trail by the majority of users
- **Compliance with AASHTO Guidelines** – can a trail be constructed that meets AASHTO guidelines. This is used as a measurement of safety.

Figure 1 - Alternatives Routes

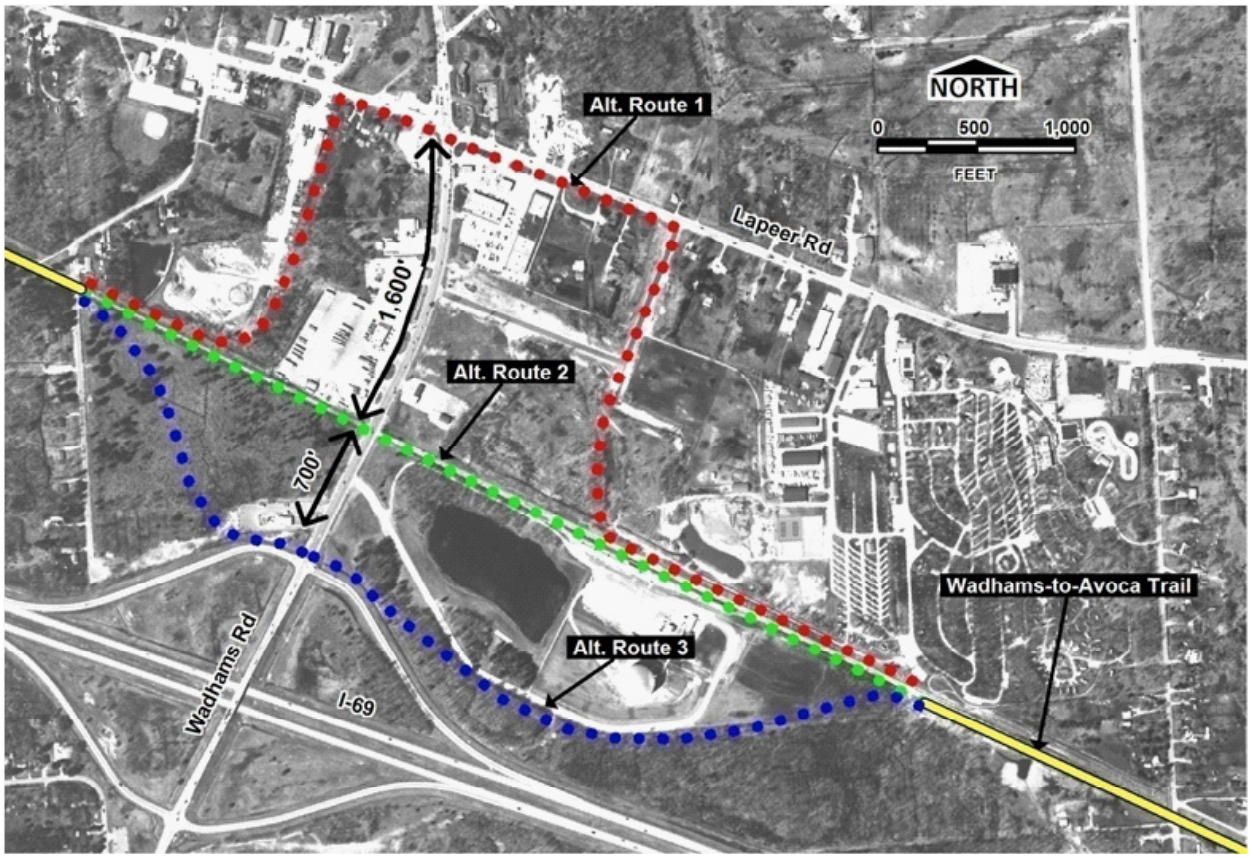


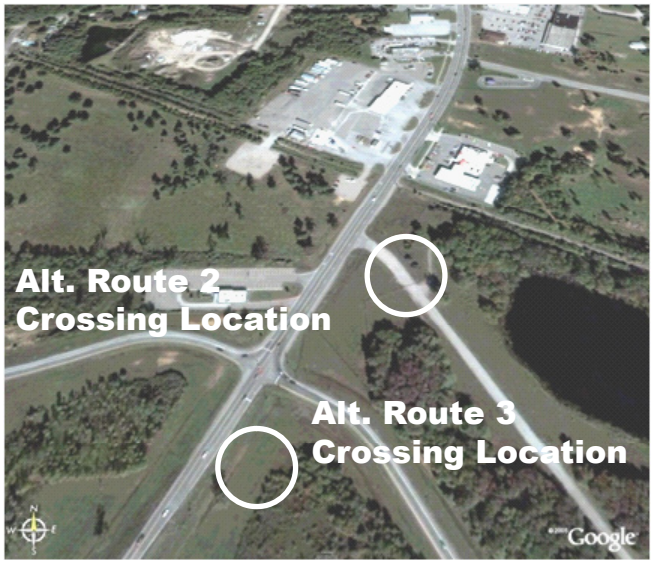
Table 1 - Alternative Route Evaluation

	Out-of-Direction Travel	Quality of Experience	Compliance with AASHTO Guidelines
Alt. Route 1	1.57 x the distance of the most direct route and an abrupt departure from the trail alignment.	Poor – many automobile oriented commercial developments.	No - numerous high volume commercial driveways would make for an unsatisfactory Shared-use Path.
Alt. Route 2	Most direct route possible.	Unknown as area will likely develop in the near-term.	Yes, the crossing point is more than 660' from a signalized intersection.
Alt. Route 3	1.12 x the distance of the most direct route with a gradual departure from the trail alignment.	Unknown as area will likely develop in the near-term.	Yes.

Alternative Route Evaluation Summary

Alternative Route 1 was deemed an unfeasible alternative. Crossing Alternatives were explored for Alternative Routes 2 and 3.

Figure 2 – Alternative Routes 2 and 3 Crossing Locations



Crossing Options Evaluation Factors

A preliminary assessment of the crossing options was prepared using the following evaluation factors:

- Safety – safety issues for both non-motorized and motorized users
- Motorized Traffic Impact – what affects will the proposed crosswalk have on the flow of the intersection / road segment.
- Construction Cost / Issues – relative cost of the improvements.
- Acquisitions/Easements – what properties, if any, will need to be acquired or long-term easement obtained.

Alternative Route 2 Crossing Options

The following options were explored for Alternative Route 2:

2A – No Action – Do not mark crosswalk or make any improvements.

2B – Unsignalized At Grade Crosswalk, 3 Lanes – Add a pedestrian refuge island by converting road from four lanes to three lane road and placing crossing island in the center turn lane area.

2C – Unsignalized At Grade Crosswalk, 4 Lanes – Add a marked crosswalk with a crossing island by widening the existing four lane road.

2D – Signalized At Grade Crossing – Add a pedestrian activated signal.

2E – Underpass – Add a pedestrian underpass.

2F – Overpass – Add a pedestrian overpass.

Figure 3- Alternative Route 2 Crossing Location Looking North

Table 2 - Alternate Route Crossing Options Evaluation

	Safety Issues	Motorized Traffic Capacity Impact	Construction Cost / Issues	Acquisitions / Easement
2A – No Action	Unpredictable usable gaps for pedestrians due many access points. Unexpected pedestrians and bicyclists in road.	None.	None.	None.
2B – Unsignalized At- Grade Crossing, 3 Lanes	Clear sight triangles frequently blocked by trucks exiting truck stop. Marginal stopping sight distance especially for vehicles existing driveways.	Probably minimal if any, additional data and analysis needed for full assessment.	Moderate – crossing island, lighting, signage and pavement markings.	None.
2C – Unsignalized At-Grade Crosswalk, 4 Lanes	Same sight issues as above and potential for multiple threat crashes.	None.	High – widen road, crossing island, lighting, signage and pavement markings.	Probably none.
2D – Signalized At-Grade Crossing	Potential for rear-end crashes with intermittent use of new signal.	Minimal depending if signal can be coordinated with existing signals.	Moderate – pedestrian activated signal and pavement markings.	None.
2E – Underpass	Perceived and real personal safety issues. Some users will cross at-grade because of discomfort using underpass.	None.	Very high. May need to provide pumps to drain storm water.	None.
2F – Overpass	Safety of bicyclists descending ramps. Some users will cross at-grade because of fear of heights.	None.	Very high.	None if ramps follow the trail corridor, circular ramps would require additional ROW.

Alternative Route 3 Crossing Options

The following options were explored for Alterative Route 3:

3A – Pedestrian Signal – Add a pedestrian activated signal to the existing I-69 Ramp / Wadhams Road intersection traffic signal.

3B – Roundabout – Replace the existing signalized intersection with a single lane roundabout with crosswalks.

Figure 4- Alternative Route Crossing Location, Looking South

Table 3 - Alternate Route 3 Crossing Options Evaluation

	Safety Issues	Motorized Traffic Capacity Impact	Construction Cost / Issues	Acquisitions / Easement
3A – Pedestrian Signal	Right turn on red not yielding to pedestrians in crosswalk.	Minimal – pedestrian clearance interval may extend some signal phases.	Moderate – pedestrian signal, pavement markings and lighting. May need new controller.	None.
3B – Roundabout	Pedestrians with sight impairments.	None.	Moderate – higher initial cost than signal but lower maintenance costs.	None.

Feasible Alternatives

Based on the preliminary assessment, four alternatives were identified as feasible alternatives:

- 2B – Unsignalized At- Grade Crossing, 3 Lanes
- 2D – Signalized At-Grade Crossing
- 3A – Pedestrian Signal
- 3B – Roundabout

Alternative 2B needs further assessment to determine if converting the road to three lanes with bicycle lanes would improve the sight triangles sufficiently to make for a safe crossing. The conversion to three lanes though may reduce the number of usable gaps. Infrequent usable gaps may cause excessive delay for the trail users who may then become impatient and try to cross when it would not be safe.

Alternate 2D needs further assessment to look at the safety implications of introducing a new signal, if the signal would meet warrants and the potential to coordinate the new signal with the signals at Lapeer and the freeway ramps. The use of coordinated signals though may cause excessive delay for the trail users who may then become impatient and cross against the light.

Both Alternative 3A and 3B need further assessment to see if ROW or a long-term easement may be obtained in order to provide a gradual departure from the existing trail alignment to the desired crossing point. If the trail were to continue to Wadhams Road and then follow the road to the crossing point the majority of users would likely option to try crossing where the trail meets the road.

Alternative 3A needs further assessment to determine if the compliance with the existing signal is sufficient to provide safety to trail users.

Alternative 3B needs further assessment to make sure that a single lane roundabout would have sufficient capacity. The use of a two-lane roundabout would not provide a satisfactory trail crossing.

Preferred Alternative

Of the four feasible alternatives the preferred alternative based on the information available is Alternative 3B, the roundabout at the freeway ramp. This would cause minimal delays to pedestrians and motorists. Any crashes would be at slower speeds dramatically increasing the survivability of a crash for a pedestrian or bicyclist and reducing the severity of injury and extent of property damage for motorists.

The roundabout may also be desirable to pair with a 4 to 3 lane conversion on Wadhams Road from the freeway ramps to Lapeer Road. The end result would be a safer roadway for motorists and have the added advantage of providing bike lanes for bicyclists who may want to visit the commercial establishments along Wadhams Road.