2019 Draft Pedestrian and Bicycle Master Plan

THE VILLAGE OF HOBART

OCTOBER 2019

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Acknowledgements

Village of Hobart 2019 Pedestrian and Bicycle Plan

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Brown County Established 1818

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1. Evaluation

1.1 Introduction

People walk and ride a bicycle for a variety of reasons – recreation, fitness, commuting to work, and travel to non-work destinations. Both walking and cycling are efficient and inexpensive forms of transportation that can provide a variety of benefits - community health, livability, decreased vehicular traffic, to name a few - with increased use. As communities continue to change, they should periodically review existing conditions, policies, and procedures to find opportunities for improvement, and to further realize these benefits.

The Village of Hobart has grown rapidly over the last three decades, and especially since 2010, with an estimated 3,000+ additional people in the last nine years[1]. As more people continue to move to the village, the interest level in walking and bicycling will most likely grow. Increased population will also mean that more people are traveling around the community, to a large degree by vehicle. These changing conditions mean more people are using the existing transportation network, but the facilities have largely remained the same. Through working on this plan, the Village is proactively working to plan long-range to address community needs and desires.

However, the village cannot stop at the provision of facilities if it hopes to develop a culture of bicycling and walking. It must also help to inform motorists and non-motorists of their rights and responsibilities, ensure that they are following local and state laws, and provide incentives for residents and visitors to use the facilities for transportation and recreational purposes.

The Village of Hobart's 2036 Comprehensive Plan identifies the creation of a pedestrian and bicycle plan as an important component to create a safe and well-connected pedestrian and bicycle system in the Village. The plan recommends three goals:

- *Expand the development of land use patterns that enable and encourage walking and bicycling.*
- *Create a safe, continuous pedestrian system throughout the Village.*
- *Enable people to easily reach developments in the Village on foot or by bicycle.*

Pedestrian and Bicycle Plan Purpose

This plan will provide the framework to advance the comprehensive plan's three goals through the following plan elements:

I. Evaluation

Goal and Objectives. This section states the Pedestrian and Bicycle Plan's goals, and the objectives to achieve those goals.

Existing Efforts and Conditions. This section addresses recent and current engineering, education, enforcement, and encouragement efforts in Hobart. This section also summarizes the locations and circumstances of reported bicycle and pedestrian crashes in the Village.

II. Engineering

Physical Conditions Analysis. This section includes photos of specific intersections and roadway segments and recommends modifications that will improve safety and accessibility, and looks at ways to improve pedestrian and bicycle connections throughout the Village.

III. Education and Initiatives

Education, Enforcement, Encouragement, Evaluation, and Equity. This section includes recommendations for each of these elements and identifies specific techniques the village can use to implement the recommendations.

IV. Recommendations

Implementation Matrix. The section includes a matrix that identifies when the village should implement each recommendation, how each recommendation should be implemented (through code or policy modifications, etc.), the entities that are responsible for implementing each recommendation, and grant programs and other resources that can be used to implement the plan's recommendations.

[1]2019 Wisconsin Department of Administration Official Final Population Estimates

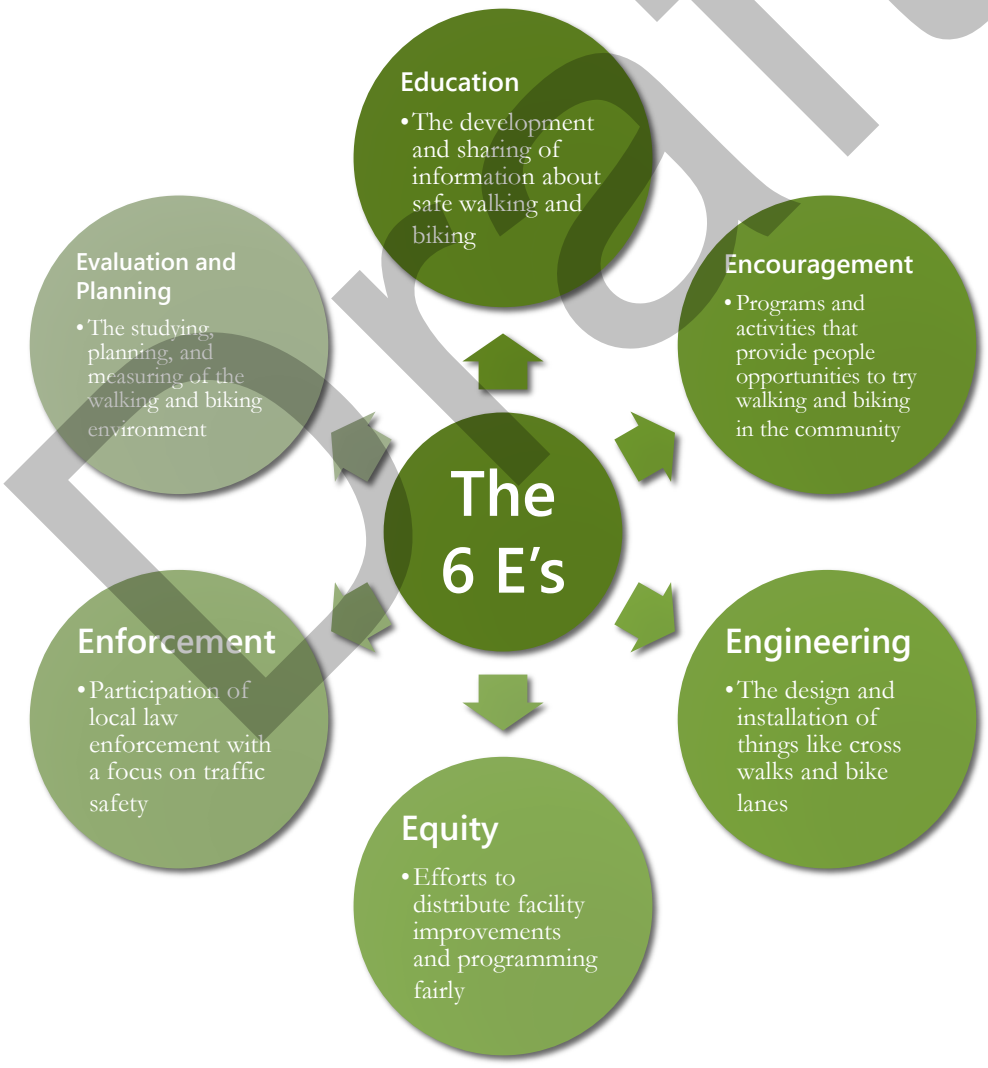
1.1 Introduction - Guiding Principles

The 6 E's of Pedestrian and Bicycle Planning

The 6 E's – Engineering, Education, Enforcement, Encouragement, Evaluation, and Equity – are key components to a comprehensive, integrated approach to pedestrian and bicycle planning. This approach is used by Safe Routes to School programs, and in recent years has added an E, Equity, to bring the total to six.

The incorporation of education, enforcement, encouragement, evaluation, and equity with the provision of bicycle and pedestrian facilities (engineering) is recognized as essential to creating safe and convenient bicycle and pedestrian systems. This approach to bicycle and pedestrian planning has been used to develop the 2016 Brown County's Bicycle and Pedestrian Plan, other local plans, and is the foundation of WisDOT's Bicycle Transportation Plan. This approach has also been used throughout the country to create comprehensive bicycle and pedestrian systems for many years, and is a broad concept to sufficiently address pedestrian and bicycle safety. The 6 E's don't have a specific order, and multiple efforts may be occurring at any given time.

This plan will use this approach to ensure a thorough effort, and that all available options are considered.



1.2 Goals and Objectives

Vision

The Village of Hobart will develop a walking and bicycling culture that enables people of all ages and physical abilities to safely and conveniently travel throughout the community.

Goal I. Expand the existing pedestrian and bicycle network in the Village of Hobart.

Objectives

a. Identify and prioritize short- and long-term projects to reduce barriers for safe pedestrian travel between different areas in the village.

b. Create a seamless corridor system for bicyclists and pedestrians that will provide safe and efficient access to several activity centers within and outside the village.

c. Develop "complete streets" in Hobart by including appropriate provisions for bicyclists and pedestrians when planning, designing, and constructing/reconstructing all streets in the village. This includes considering pedestrians and bicyclists when designing and building intersections, bridges, pavement surfaces, pavement widths, and other street characteristics.

Goal II. Provide and support educational programming that promotes increased walking and biking in the village.

Objectives

a. Educate people of all abilities of the rights and responsibilities of pedestrians, bicyclists, and motorists.

b. Develop village- and school-based programs that educate students and their parents about safe walking and bicycling practices and encourage parents to allow their children to walk or bike to school.

c. Teach bicyclists, pedestrians, and motorists the importance of making predictable movements at intersections, driveways, and other conflict points.

Goal III. Work to change unsafe travel behaviors, and reinforce safe ones.

Objectives

a. Ensure that law enforcement officers and crossing guards are trained in current bicycle and pedestrian laws and enforcement techniques.

b. Develop enforcement programs that maximize compliance with laws that apply to bicyclists, pedestrians, and motorists.

c. Work with the Brown County Sheriff's Department to address the designation of hazardous streets in the village.

Goal IV. Provide opportunities in the village to help make pedestrians and bicyclists more comfortable traveling around in the community.

Objectives

a. Ensure that convenient bicycle parking is available at all parks, government buildings, and other village-owned facilities. Also encourage the establishment of convenient bicycle parking at all schools, major employers, shopping centers, and other major activity centers.

b. Work with developers to create bicycle- and pedestrian-friendly developments and site designs.

c. Include requirements for the provision of direct bicycle and pedestrian access from public streets and sidewalks in the village's codes and community design standards.

d. Allow and encourage the mixing of compatible land uses to provide a variety of destinations that can reached on foot and by bicycle.

1.3 Existing Conditions

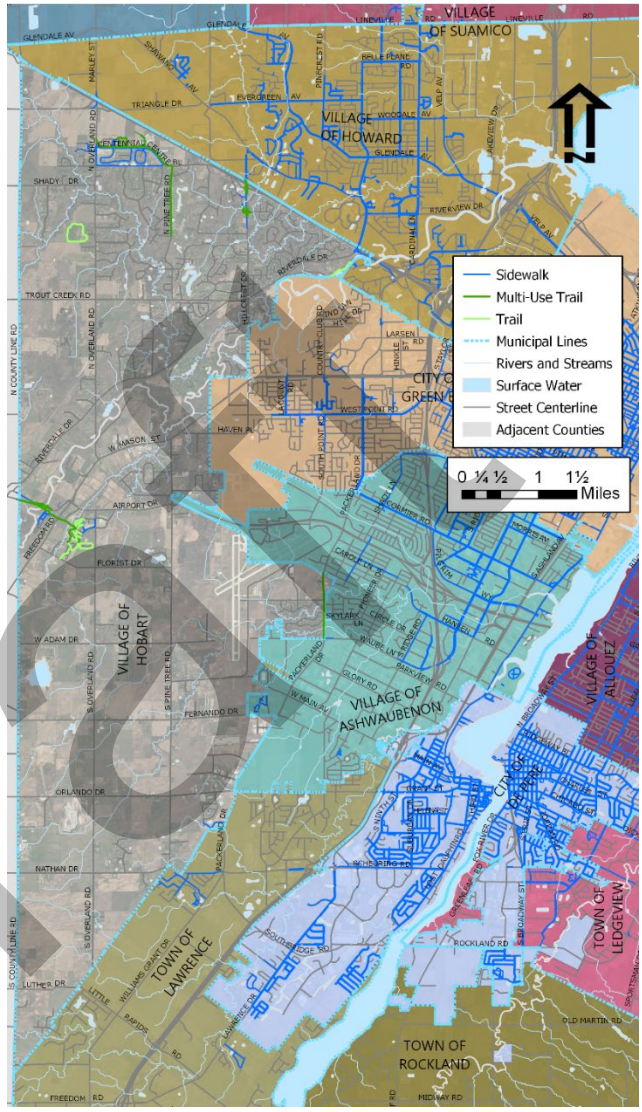
Village Pedestrian Network

The village's existing sidewalks are mostly in the northern half, in the Centennial Centre development and along a portion of Hillcrest Drive.

The village also has multi-use trails, including along North Pine Tree Road, and off of West Mason Street at the west end of the village.

Multi-use trails are considered larger than trails, and are generally eight to ten feet wide, and usually paved. Walking trails may be unpaved, and are usually five feet wide or less. Multi-use trails will more easily accommodate multiple users (such as walkers, bicyclists, wheelchair users, and skaters) in a given area, whereas walking trails won't.

Village of Hobart Existing Pedestrian Facilities	
Sidewalks	6.42 miles
Multi-use trail	5.93 miles
Trail	2.41 miles
Total	**14.76**



Sidewalk along North Hillcrest Drive. Source: BC Planning Commission.

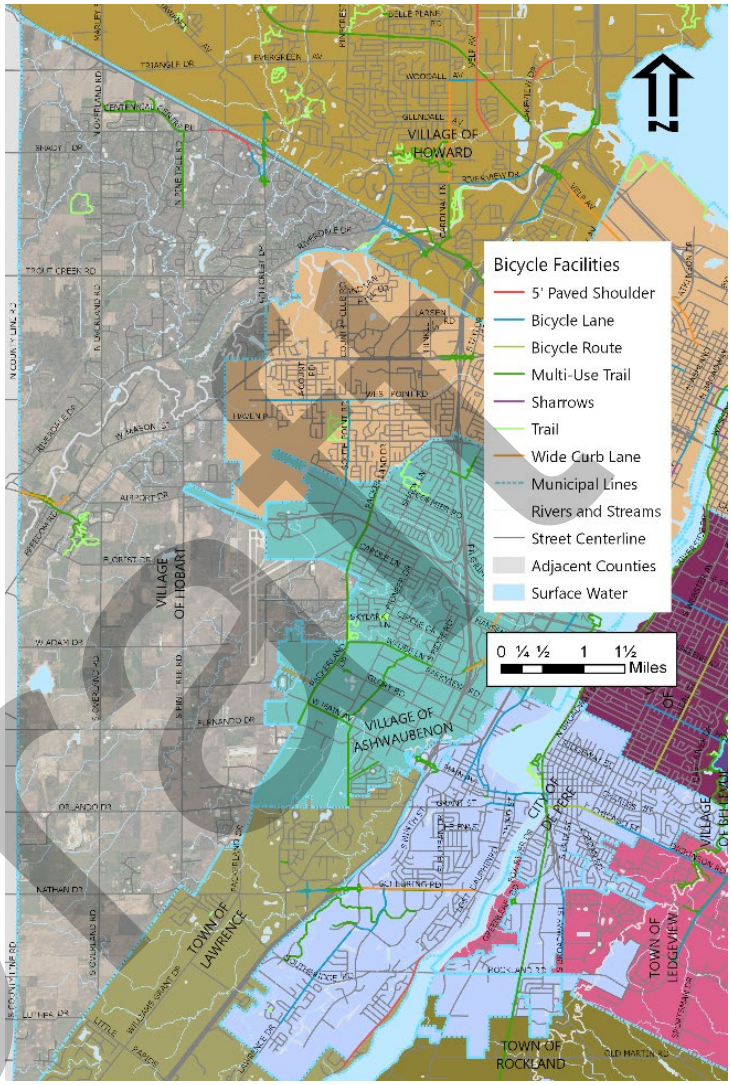
1.3 Existing Conditions

Village Bicycle Network

The village's existing bicycle system currently has a 11 miles of facilities. Multi-use trails make up a majority of the system, with trails being the second largest amount.

The village's bicycle system is very fragmented, with minimal connections between the different facilities.

Village of Hobart Existing Bicycle Facilities	
5' paved shoulder	0.59 miles
Bicycle lane	1.59 miles
Bicycle route	0 miles
Multi-use trail	5.93 miles
Sharrows	0 miles
Trail	2.41 miles
Wide curb lane	0.64 miles
Total	**11.16 miles**



Multi-use trail south of Airport Drive and east of Freedom Road. Source: BC Planning Commission.

1.3 Existing Conditions

Challenges And Opportunities

Below are some examples of the different challenges in the village related to existing pedestrian and bicycle infrastructure. These contribute to the existing network gaps, and present challenges to enhance connections between different areas.

These conditions also present chances to create and enhance connections in different ways, and could serve as opportunities for the village to showcase its unique features.

Steep drop off along North Pine Tree Road. Source: BC Planning Commission.

The end of the North Pine Tree multi-use trail. Source: BC Planning Commission.

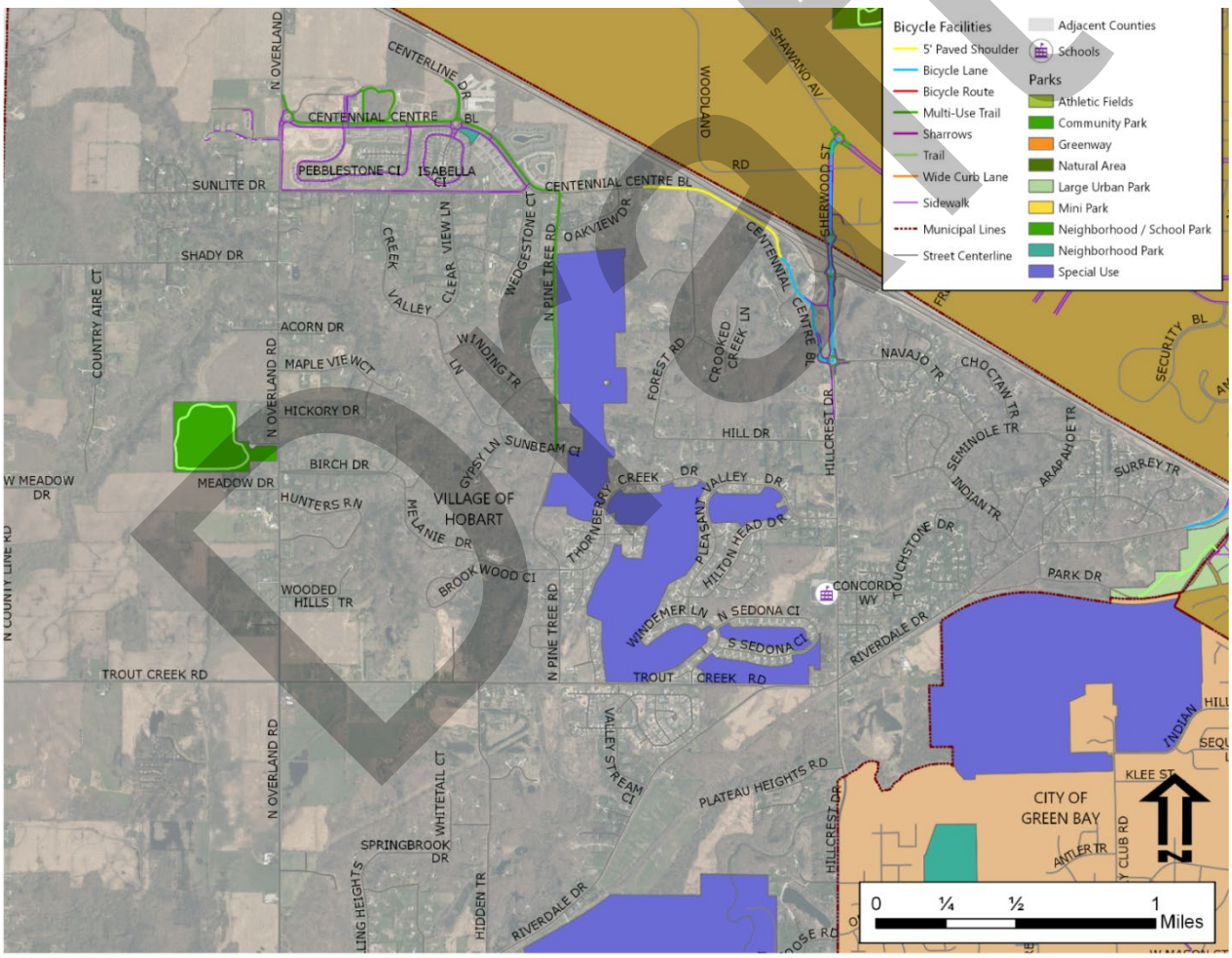
Looking east, the narrow right-of-way and no paved shoulder along Centennial Centre Boulevard between Forest Road and Oakview Court . Source: BC Planning Commission.

Centennial Centre Boulevard wetlands to the south, and east-bound State Highway 29/32 along the north side. The road has a paved shoulder, but high speed traffic conditions. BC Planning Commission.

1.3 Existing Conditions

Northern Hobart Existing Gaps

The northern half of Hobart has a number of destinations, including Hillcrest Elementary School, Four Seasons Park, and Pamperin Park. As commercial sites continue to develop in Centennial Centre, the area will offer more places to visit, also. Currently a number of factors impede pedestrians and bicyclists from safely accessing these different areas. High traffic speeds and volumes along North Overland Road, Trout Creek Road, Hillcrest Drive, and portions of Centennial Centre Boulevard discourage many people from traveling on them. While the village's northern half does have some pedestrian and bicycle infrastructure in place, the individual facilities lack connections between them.

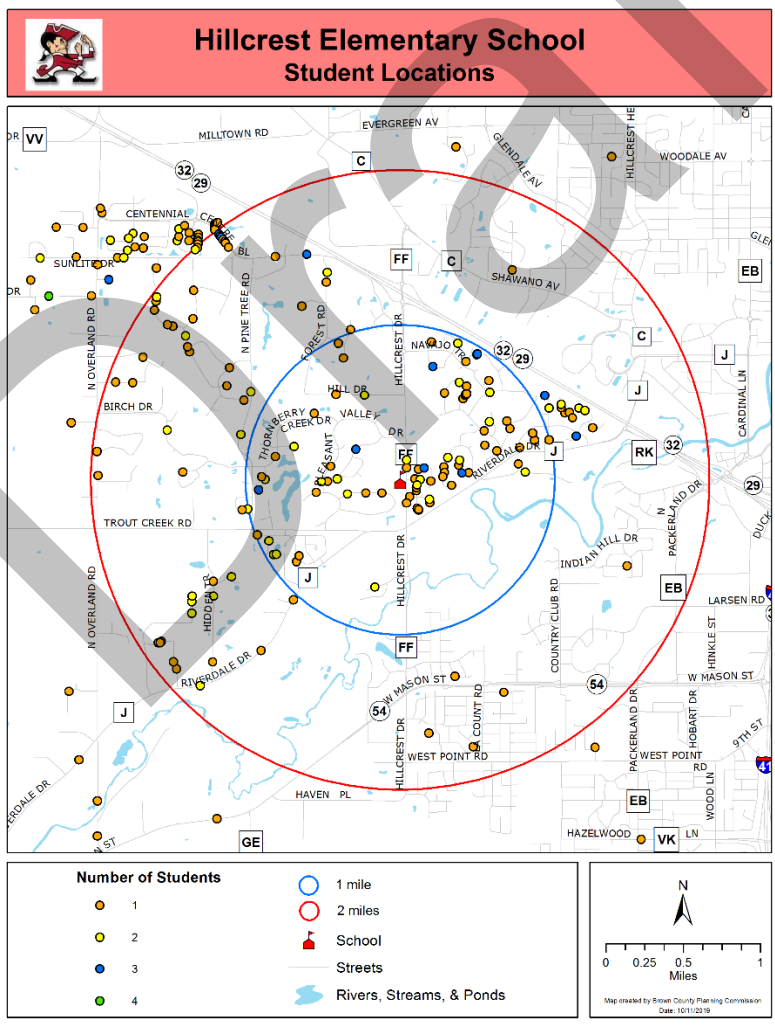


1.3 Existing Conditions

Hillcrest Elementary and Hillcrest Drive

During the research phase of this plan, project staff mapped the generalized locations of all households with students attending Hillcrest Elementary School in May of 2019 to determine what density lived near the school, specifically within a one mile radius. Pulaski School District staff provided anonymous address data used in the map below.

In conversations with Hillcrest Elementary staff and parents, almost all students travel to the school by either bus or private vehicle, with at most only a few students walking to the school. Hillcrest Drive is a busy road with a 45 mile per hour speed limit, and currently serves as a barrier to walking to school. A Hillcrest parent worked with the principal to survey student families and community members about interest in a crosswalk on Hillcrest Drive linking the school to the subdivision to the east. From over 300 responses, over 71% respondents said they would allow their child(ren) to walk or bike to school if a proper crosswalk with enhanced safety features were installed. While there may be other things to consider, these results indicate a general community desire for enhanced pedestrian connections to the school. Note: The principal and the parent that coordinated the survey provided the survey results to project staff.

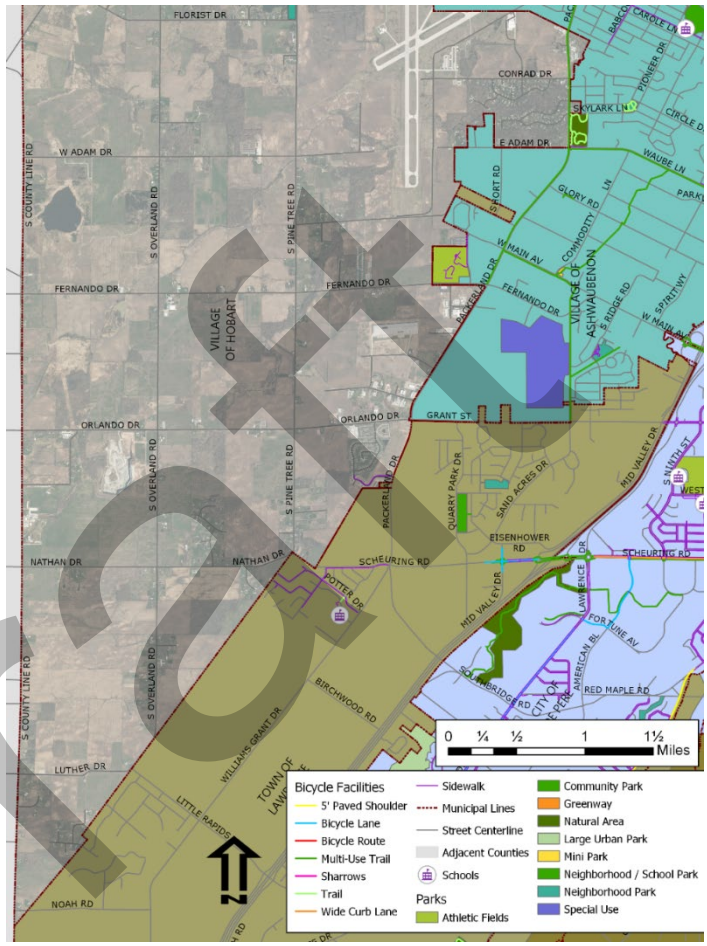


1.3 Existing Conditions

Southern Hobart Existing Gaps

The southern half of Hobart does not connect to the northern half with any bicycle and pedestrian facilities. The east-west roads are more lightly traveled, so they may feel safer to many people. Both South Overland and South Pine Tree are busier, making them less desirable to travel north on. The airport also acts as a barrier, and can only be navigated around via Cyrus Drive on the south side. Airport Drive/STH 172 is not a viable pedestrian and bicycling option on the airport's north side.

While Hobart hasn't had the same level of population growth on the south side, the village has had residential growth by Orlando Drive and west of Packerland Drive. This growth is close to destinations in Lawrence, Ashwaubenon, and De Pere, including West De Pere District schools. The village has some opportunities to work collaboratively to enhance the connections to these places, which will be comparatively easier than connecting to the northern side of the village due to distance, terrain, and existing right-of-way width.



South Overland Drive. Less heavily traveled by vehicles, but narrow roadway width. Source: BC Planning Commission.

1.3 Existing Conditions - Education, Enforcement, and Encouragement Efforts

Enforcement Efforts

The Hobart-Lawrence Police Department (HLPD) enforces the rules of the road during its daily patrol activities. The HLPD has also placed a speed board trailer at various points around the village, including by Hillcrest Elementary.

Education Efforts

To date, the village hasn't undertaken any extensive education efforts because the population level and relatively low pedestrian and bicycling activity had not prompted it. With the population increase in the village, especially the growth around Centennial Centre, the need for that has increased.

Encouragement Efforts

The village has employed a few different encouragement efforts through recent development.

Sidewalks and Traffic Calming Devices

Recent development in Centennial Centre has included sidewalks and other walkways throughout. The village has also worked with the county and state to construct roundabouts, curb extensions, and other devices that slow traffic and encourage people to walk and bicycle, like at the start of Centennial Centre Boulevard and Hillcrest Drive.

Mixing Compatible Land Uses

The village has allowed mixing of compatible land uses in the Centennial Centre Boulevard that will provide a variety of destinations that can be reached on foot and by bicycle.

Pedestrian- and Bicycle-Friendly Site Designs

The Centennial Centre development has included sidewalks and multi-use trails in its development, and considers these items as part of the site plan review process. Recently completed construction along Founders Terrace and Larsen Orchard Parkway includes more pedestrian-friendly design such as buildings fronting the street, identified crosswalks, and narrow streets coupled with parallel parking to encourage lower vehicular speeds.

Centennial Centre residential development fronting Founders Terrace and Centennial Centre Boulevard. Source: 2019 Google Earth

Pedestrian features at Centennial Centre Boulevard and Hillcrest Drive. Source: BC Planning Commission staff

1.3 Existing Conditions – Pedestrian and Bicycle Crashes in the Village of Hobart

Pedestrian Crashes in Hobart

The village had two pedestrian-vehicular crashes between 2014-2018. One pedestrian crash occurred on Pine Tree Road at Cyrus Drive. The other was at Centennial Centre Boulevard and North Pine Tree Road.

Bicycle Crashes in Hobart

The village also had two bicycle-vehicular crashes between 2014-2018. One crash occurred at County Road EE (Orlando Drive) and Navigator Way, and the other was on South Pine Tree Road at Fernando Drive. Both crashes were in the southern half of the village.

1.3 Existing Conditions – Public Input

Public Input Survey

Brown County Planning Commission staff created an online survey about walking and bicycling in the Village of Hobart for any interested persons to take part in. The survey was initially posted through the village website, weekly newsletter, and Facebook page starting in February 2019 through March 2019. The survey was then reposted again from April 2019 through May 2019. Through these two periods, 496 surveys were taken. The following tables are summaries of the responses received.

*Note: Not every question was answered by each participant, so totals will not match the survey total.

If you feel safe walking and/or biking, what contributes to that?	
Wide shoulders	3
Pedestrian/bike paths	26
Safety with people around	38
Low traffic	18
Low speeds	5
Sidewalks	0
Bike lanes	1
Pleasant area – feels cared for	12
Use low-traffic roads	6
Visibility and lighting	27
Awareness	10
Stay in neighborhood	16
Law enforcement	5

If you don't feel safe walking and/or biking in the village, why not?	
Narrow road	32
Lack of sidewalks/trails/bike paths	47
Feel unsafe	5
High traffic	35
High speed	34
Lack of sidewalk	1
Lack of bike lanes	9
Unpleasant	0
No low-traffic roads	0
Lack of visibility/light	4
Lack of driver awareness	6
Have to stay in neighborhood	6
Narrow road	32

What are some steps the village could take to help improve walking and biking?	
More trails/sidewalks/facilities	66
Extend existing facilities	18
Improved pedestrian and bicyclist safety	26
Add shoulders/bike lanes	41
Lower speed	0
improved connections between residential areas	73
Reduce the amount of traffic	5
Increased operations and maintenance (such as snow clearance)	19
Separated ped/bike facilities from roadway	85
Add facilities with new construction	6
Enforcement	22
Education	5
Don't increase taxes	5

1.3 Existing Conditions – Public Input

Village of Hobart Pedestrian and Bicycle Advisory Committee

The village board appointed a pedestrian and bicycle committee to review and advise on draft chapters for this plan. The committee's meetings during this planning process are summarized below.

Date	Meeting
January 16, 2019	Project kick-off with village staff
April 3, 2019	Review existing plans and relevant code sections; public input review
June 17, 2019	Draft goals and objectives presentation; review existing conditions
September 18, 2019	Presentation of proposed draft recommendations
October 23, 2019	Final review of entire plan

Through this planning process, Brown County Planning Commission staff also met with stakeholders individually, including Hobart/Lawrence Police Department staff, and Hillcrest Elementary staff and parents.

Village of Hobart Pedestrian and Bicycle Advisory Committee meeting. Source: Village of Hobart staff.

Hillcrest Elementary during afternoon pickup. Source: BC Planning Commission.

2. Pedestrian and Bicycle Network

2.1 Pedestrian and Bicycle Facility Planning

Overview

As the Village of Hobart continues to develop and add residents, the village will need to modify existing facilities, and add new ones to meet that population growth. Through this plan the village should improve pedestrian and bicycle connectivity and safety throughout the village.

When designing bicycle and pedestrian facilities, there are a variety of design guidelines (shown at right) that the village should consider following to better incorporate new facilities into the transportation system. Some general design elements are applicable to the planning, design, and implementation of both bicycle and pedestrian networks. The design guidelines listed are the leading national resources on pedestrian and bicycle facility design.

This section covers engineering treatments and techniques that can and should be used to further improve safety and create a walking and bicycling culture in the Village of Hobart.

Engineering for the Pedestrian

Engineering Considerations for Pedestrian Infrastructure

Pedestrians should receive the same respect as any other transportation mode, because everyone is a pedestrian at some point during a trip. Safe travel corridors for pedestrians should connect different village areas, and be created along all streets and highways. These facilities should be designed for disabled pedestrians (curb cuts at intersections, etc.), for these facilities will also accommodate able-bodied pedestrians.

Engineering Resources

These documents are the leading state and national resources on bicycle and pedestrian facility design. Many of the design guidelines identified by these sources are discussed in this section.

I. American Association of State Highway and Transportation Officials' (AASHTO) Guide for the Development of Bicycle Facilities

II. AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities

III. Federal Highway Administration's (FHWA) Manual on Uniform Traffic Control Devices (MUTCD)

IV. FHWA Selecting Roadway Design Treatments to Accommodate Bicyclists

V. The WisDOT Facilities Development Manual (FDM)

VI. The WisDOT Bicycle and Facilities Design Handbook

VII. Americans with Disabilities Act Accessibility Guidelines

2.1 Pedestrian and Bicycle Facility Planning

Working with Existing Facilities

The village already has a few assets for walking and biking in place now, however those are largely on the north side of the village. Network gaps make it difficult for people to walk or bike safely beyond those areas. An effective way to make improvements is to leverage the existing assets through addressing gaps and barriers in the village's existing network.

Sidewalks

The village has some existing sidewalks in the newest residential developments in Centennial Centre on the north side and a small segment of the Tailwinds Crossing subdivision on the south side.

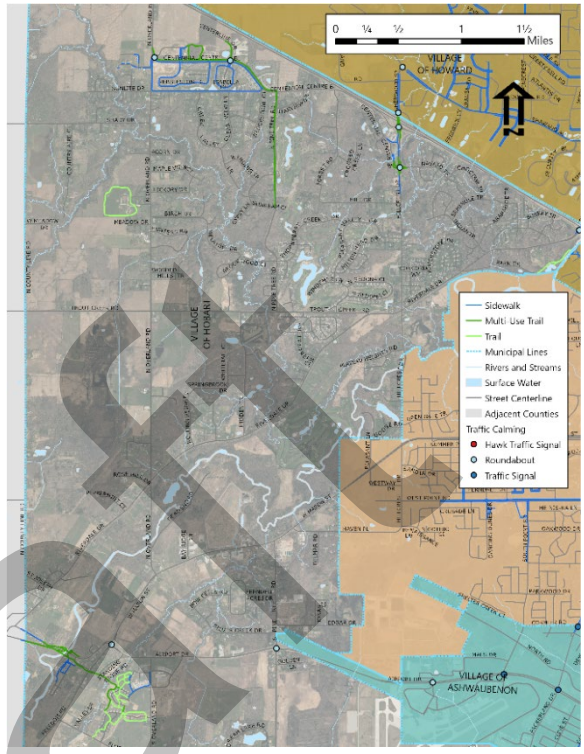
The village should continue to develop its sidewalk system as the community grows over the next 20 years by building sidewalks along both sides of public streets, especially focusing on areas where sidewalks already exist. When sidewalks are on both sides of streets, pedestrians of all ages and physical abilities can avoid crossing motor vehicle traffic to reach walkways. Placing sidewalks on both sides also eliminates the need to make what are often controversial decisions about where the single sidewalk should be constructed.

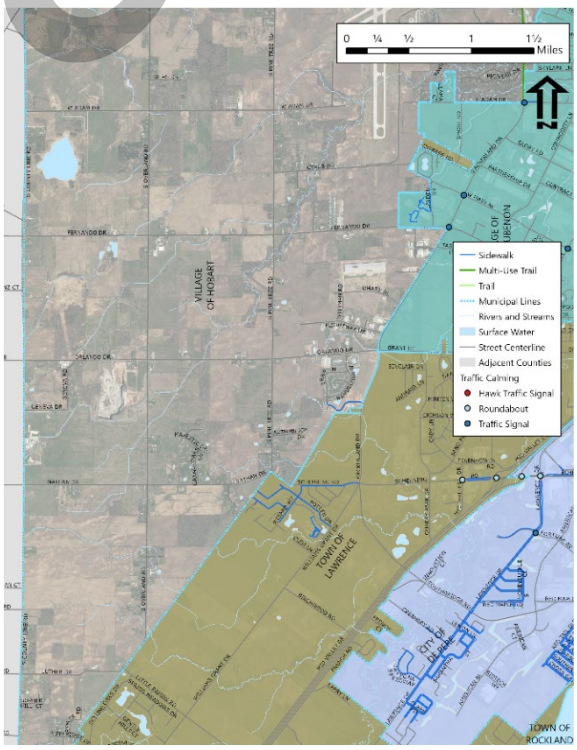
The only situation where sidewalks should not be required on both sides of a street is when physical or environmental constraints exist. In these situations, sidewalks should be required on at least one side of the street.

Typically, sidewalks are made of concrete, and are six feet wide, and located six to eight feet from the back of curb when along collector streets, and 12 feet when along arterial streets.

Multi-use Trails

The village has some multi-use trails, primarily in the northern half near Centennial Centre, and where West Mason Street meets Airport Drive. Adding multi-use trails to where they already exist in the village will help expand the pedestrian and bicycle network, and may be more appropriate than installing sidewalks in terms of both cost and space required (especially in areas where development densities are low).





2.1 Pedestrian and Bicycle Facility Planning

Multi-use trails provide a shared space for people walking and biking that is separate from motor vehicle traffic, and they work better when they have fewer intersections with motorized traffic. Multi-use paths are also ideal for wheelchair users, strollers, skaters, and other non-motorized users.

Multi-use trails are generally recommended parallel to busy roadways where on-street bicycle facilities would not be suitable for the majority of users.

Multi-use trails also work well in conjunction with natural features and seams such as streams, railroads, and through or around parks.

Multi-use paths should be a minimum of ten feet wide. Eight foot widths are acceptable for short distances in constrained spaces. Constructing asphalt paths also helps differentiate multi-use paths from sidewalks, and to reduce installation costs.

Neighborhood Slow Streets

Many of the village's local neighborhood streets have relatively low existing speeds and traffic volumes. With these streets, the village has an opportunity to create and enhance existing connections between different neighborhoods, destinations, and activity centers. In many cases, these streets may already have the makings of a route, and only require treatments or interventions in a few places to achieve the desired low speed/volume conditions and adequate crossings.

Neighborhood slow streets make walking and biking easier and safer by already having low motor vehicle speeds. With further treatments to improve crossing, and/or adding other traffic-calming measures, these already existing routes provide a way to improve connections between different areas. They also benefit residents by maintaining "quiet" streets and improving safety for all users.

Multi-use trail near Freedom Road and West Mason Street.

Multi-use trail adjacent to Hillcrest Drive/CTH FF.

Example of an existing neighborhood street in Thornberry Creek Estates.

2.2 Network Treatments and Facilities

Traffic Control Devices

The village does not currently have any signalized intersections under its jurisdiction. However, in future instances where the village would install a signalized intersection, or coordinate with an adjacent community or any other governmental entity to install a signalized intersection, the village should consider the following treatments.

Install Accessible Pedestrian Signal Activation Buttons at Signalized Intersections

When signalized intersections are projected to have only occasional pedestrian use, the village should ensure that signal activation buttons are available (or coordinate with other municipalities, the county, and/or state as needed). Also, any pedestrian signals that the village would install should comply with the Americans with Disabilities Act (ADA), and be reachable from the sidewalk.

Recognize Area Context When Considering Pedestrian Signal Activation Buttons

This strategy is an addendum to the one above. At signalized intersections that are heavily used by pedestrians, pedestrian signal activation buttons should generally be avoided. Instead, pedestrian signal phases should be built into every green light cycle to ensure that pedestrians have frequent opportunities to cross.

Do Not Use "Right Turn No Stop" Designations

"Right Turn No Stop" designations at intersections can confuse children and others who focus on the stop sign, assume that drivers will stop, and cross without realizing that the stop sign doesn't apply to turning vehicles. These designations can also confuse some drivers and cause them to run the stop sign even if they aren't making right turns. Lastly, chances are greater the driver will only look to the left to check for oncoming traffic; if someone is about to cross from the right, the driver may not see them at all. If the village allows this traffic control device, it is recommended that this device is not used for the inherent dangers presented above.

Example of a pedestrian signal activation button that is reachable from the sidewalk.

"Right Turn No Stop" signs may create confusion and problems for pedestrians.

Include Lead Pedestrian Intervals at Wide and Heavily-Used Intersections

To give pedestrians a head start crossing streets and make them more visible to drivers, the village should include lead pedestrian intervals at signalized intersections that are very wide and/or have a relatively high number of pedestrians. The lead pedestrian intervals would be triggered when pedestrian signal buttons are activated, and the intervals would last approximately five seconds before motorized traffic receives a green light.

2.2 Network Treatments and Facilities

High Intensity Activated crossWalK (HAWK signals)/Pedestrian Hybrid Beacon

A HAWK signal, sometimes also referred to as a pedestrian hybrid beacon (PHB), is a traffic control device that was modeled after a pedestrian signal concept in Europe, and initially adapted by engineers in Arizona. The signal's purpose is to increase motorists' awareness of pedestrians crossing at uncontrolled marked crosswalk locations, such as mid-block locations, and when the crosswalks themselves do not result in adequate motorist yielding.

HAWK signal in Phoenix, AZ. Source: U.S. DOT FHWA.

The HAWK beacon will remain dark until activated by a pedestrian or bicyclist pressing the crossing button. Once activated, the signal will first respond immediately with a flashing yellow pattern that then changes to a solid red light to designate "Stop" to motorists. The MUTCD provides guidance on establishing the signal phasing length.

Studies have shown a better compliance rate by motorists with a HAWK signal than other devices at pedestrian crossings. The signals are designed for use in locations that do not meet traffic engineering 'warrants' for a conventional signal. The new signal is intended to aid pedestrians who desire assistance crossing as street with heavy traffic and it also provides visually impaired pedestrians audible information as to when the walk signal is on.

Rectangular Rapid-Flashing Beacon (RRFB)

A RRFB is a high-intensity flashing sign assembly that is placed ahead of a crosswalk, and is user-activated. The RRFB uses an irregular flash pattern to alert drivers to yield to pedestrians who wish to cross the street. RRFBs are appropriate at locations where no traffic signal is present, and on either two-lane roads or four-lane roads with a median or center island.

RRFB. Source: U.S. DOT FHWA.

Pedestrian Hybrid Beacon Operation

	DRIVERS		PEDESTRIANS	
	Will See ...	Will Do ...	Will See ...	Will Do ...
1		Proceed with caution.		Push the button to activate the system.
2	FLASHING	Proceed with caution. A pedestrian has activated the system.		Wait.
3		Stop if safe to do so.		Continue to wait.
4		STOP. A pedestrian is in the crosswalk.		Start crossing when all vehicles are stopped.
5	FLASHING	STOP. Proceed with caution if the crosswalk is clear.	09	Continue crossing; the signal will count down.
6		Proceed if the cross-walk is clear.		Push the button to activate the system.

Source: WisDOT.

2.2 Network Treatments and Facilities

Crosswalks

Add Advance Stop Bars at Major Uncontrolled Street Crossings or HAWK Signals

Advance yield/stop line include the stop bar or "sharks teeth" yield markings placed 20 to 50 feet in advance of a marked crosswalk to indicate where vehicles are required to stop or yield in compliance with the accompanying "STOP Here for Pedestrians" or "YIELD Here for Pedestrians".

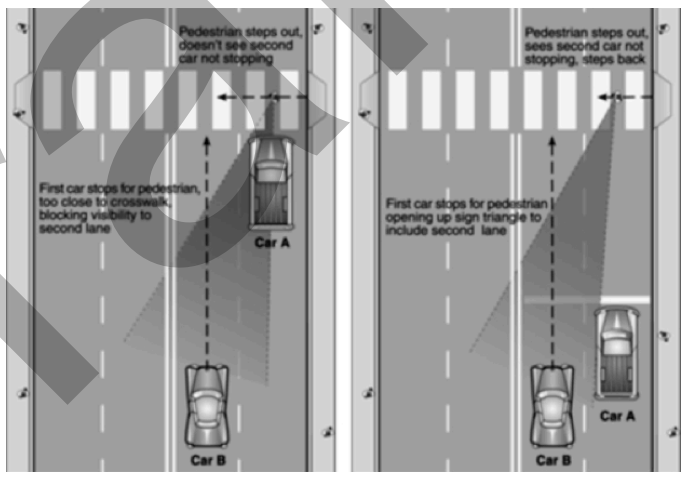
This discourages drivers from stopping too close to crosswalks and blocking other drivers' views of pedestrians and pedestrians' views of vehicles, minimizing the risk of "hidden threat" crashes. An AASHTO study found that a "sign alone reduced conflicts between drivers and pedestrians by 67 percent, and with the addition of an advanced stop or yield line, this type of conflict was reduced by 90 percent compared to baseline levels."[1]

Distinguish Crosswalks in Higher Pedestrian Traffic Areas

As higher density areas continue to develop in Hobart, specifically in Centennial Centre, the village should consider continued use of stamped and/or colored pavement to define the crosswalks and enhance the appearance of street corridors. To maximize crosswalk visibility for approaching drivers (especially at night), the crosswalks should also use reflective white paint to define the pedestrian area.

[1]American Association of State Highway and Transportation Officials, *Guide for the Planning, Design, and Operation of Pedestrian Facilities*, July 2004. Pedsafe, U.S. DOT FHWA, http://www.pedbikesafe.org/pedsafe/countermeasures_detail.cfm?CM_NUM=13.

Advance yield markings at midblock crosswalk with a refuge island. Source: pedbikeimages.org – Toole Design Group.



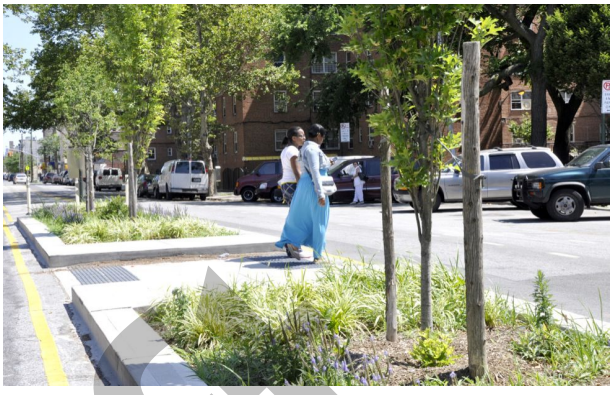
Advance stop lines and yield markings improve the visibility of pedestrians to motorists (right image compared to left). Source: Pedsafe, U.S. DOT FHWA.

Painted crosswalk in Denver, CO.

2.2 Network Treatments and Facilities

Use Medians and Pedestrian Refuge Islands at Pedestrian Crossings

When appropriate in more urban or suburban conditions in the village, the village should work toward installing pedestrian refuge islands in the center of arterial streets. In addition to calming traffic and enabling people to cross one direction of traffic at a time, the islands encourage drivers to yield to pedestrians in the crosswalks because their intentions are clear to drivers. Pedestrian refuge islands can be established at controlled intersections (e.g. as roundabout splitter islands, as already done at the roundabouts in Centennial Centre, or at the end of medians), but they are also very useful at uncontrolled intersections or at midblock crossings.



Pedestrian island. Source: National Association of City Transportation Officials.

Directly Align Curb Ramps with Crosswalks

Curb ramps should be included as sidewalks are constructed. This will allow the pedestrian to stay within the crosswalks upon entering and exiting the crosswalk. The best approach is to build perpendicular ramps that directly connect to each crosswalk, but well-placed single ramps can also work in certain situations. To prevent these types of issues, sidewalks should be included in all new construction projects.

Perpendicular curb ramps aligned with crosswalks.

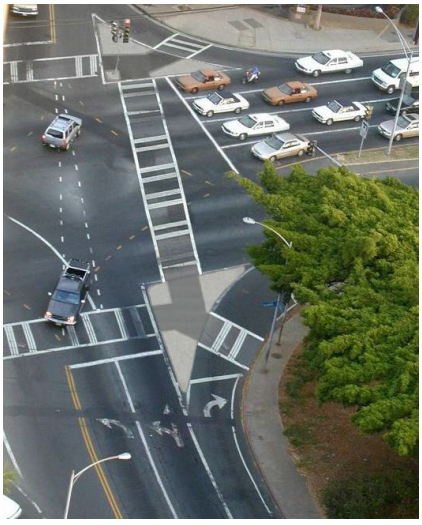
Avoid Establishing Right Turn "Slip" Lanes at Intersections

Because right turn "slip" lanes expose pedestrians to vehicles that are able to turn corners at relatively high speeds, the village should work with the state and county to make sure slip lanes are not built at intersections, unless they are absolutely necessary, along heavy truck routes that have tight corners.

When slip lanes are necessary, the "pork chop" islands that separate the slip lanes from the other driving lanes should be designed to be easily and safely used by people of all ages and physical abilities. This means that the islands should:

- Be large enough to serve as comfortable pedestrian refuges.
- Have curb cuts at all crosswalk approaches.
- Be designed so that sign posts, signal posts, and other fixed objects do not act as obstacles.

Slip lanes should also have a sharp enough angle to reduce vehicle speed through the turn, and to increase visibility.



Example of a well-designed right turn slip lane. Source: Pedsafe, U.S. DOT FHWA.

2.2 Network Treatments and Facilities

Speed Management - Incorporate Vertical Traffic Control Measures to Reduce Speeds

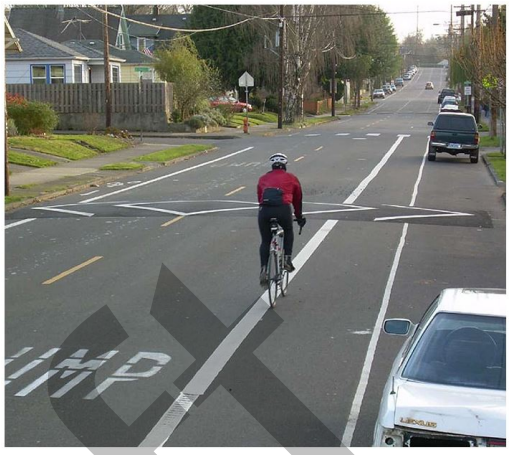
To reduce traffic speeds on streets where pedestrians want to cross regularly, the village should consider installing vertical traffic controls. The most common application is a speed bump, which is frequently used in parking lots. Speed tables and speed humps are two other types of vertical control that could work in different applications in Hobart.

Speed Humps

Speed humps are typically three inches in height, and twelve feet in length along the vehicle travel path axis, and extend across the length of the roadway at a right angle. The speed hump has a more gradual angle compared to a speed bump that people on bicycles will feel more comfortable going over them, but still enough discomfort to discourage motor vehicle speeding. They are more appropriate for residential streets, and where a street provides access to something like a school, park, or community center. Speed tables are generally not appropriate where there are a lot long-wheelbase vehicles, such as in industrial areas. Speed humps are generally not appropriate on streets where the pre-implementation 85th percentile speed is 45 mph or more.

Speed Tables

A speed table is also a midblock traffic calming device like a speed hump, but they are longer than speed humps. Speed tables have a flat top and are generally long enough to accommodate the entire wheelbase of most passenger cars. Speed tables may be more appropriate when incorporated with a crosswalk (referred to as a raised crosswalk). Raised crosswalks may also incorporate elements such as pavers or integrally-colored concrete to accent the crossing area.



Speed hump on a street with bike lanes and on-street parking. Source: U.S. DOT FHWA, Speed Management, Traffic Calming.

Speed table. Source: U.S. DOT FHWA, Speed Management, Traffic Calming.

Speed table/elevated crosswalk in a commercial area. Source: Urban Street Design Guide, National Association of City Transportation Officials.

2.2 Network Treatments and Facilities

Incorporate Lateral Shifts to Reduce Traffic Speed

Laterally shifting the street alignment in one direction will help reduce motor vehicle speed along the street. In order to feel comfortable driving through the feature, the motorist will reduce their travel speed.

Chicanes

Chicanes are a series of alternating curves or lane shifts. Chicanes are a lateral roadway shift with a return to the original path. The maneuver will prompt the motorist to reduce their speed to go through the series of shifts. Chicanes can be created with curb extensions that alternate from one side of the street to the other. Another option to is shift on-street parking to create the chicane. Where neither of those options make sense, street landscaping features could achieve the effect.

Mini roundabouts

Roundabouts are already a familiar sight in Brown County. Mini roundabouts (and neighborhood traffic circles) are related, but can be used in physically-constrained locations, and are appropriate on lower traffic streets with uncontrolled intersections. They have also been shown to increase intersection safety. Traffic circles may be installed with simple markings or raised islands. They may also incorporate landscaping to beautify the streetscape, which also further calms traffic. Depending on the situation, the central island could also be sized to allow for truck traffic to pass over it to make a turn, while still diverting car traffic around the circle.

On streets where the village is considering a pedestrian/bicycle route, installing traffic circles may be a low-tech way to help improve intersection safety.

Bike route with chicanes to slow traffic flow. Source: Urban Street Design Guide, National Association of City Transportation Officials.

Mini roundabout with mountable apron and island that larger vehicles can drive over to negotiate turn. Source: Urban Street Design Guide, National Association of City Transportation Officials.

Traffic circle with landscaping. Source: U.S. DOT FHWA, Speed Management, Traffic Calming.

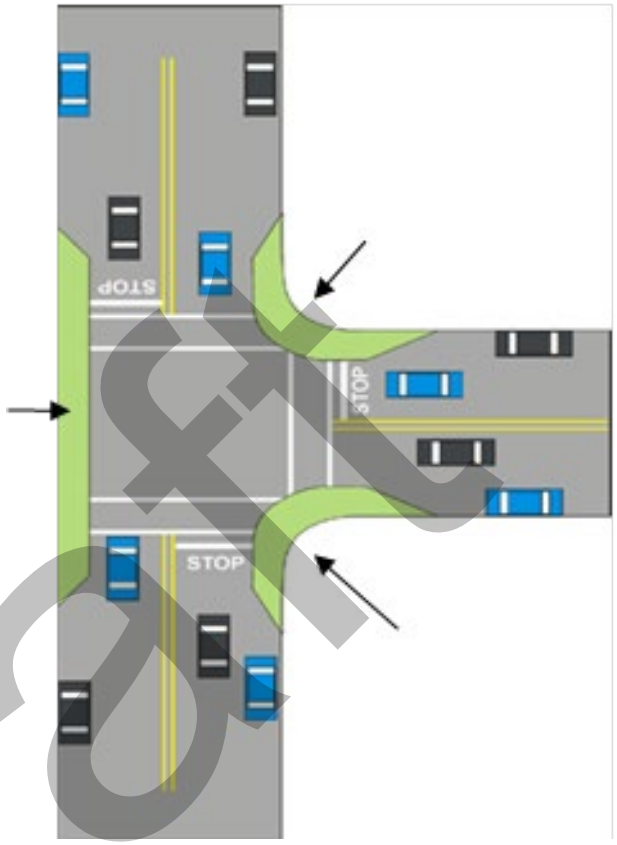
2.2 Network Treatments and Facilities

Install Curb Extensions in High-Priority Areas

When the village installs new curb and gutter in the future in anticipated high pedestrian areas, it should consider installing curb extensions. Curb extensions improve pedestrian safety because they help to maximize predictability and minimize speed and exposure at crossings. Specifically, curb extensions:

- Prohibit drivers from using parking lanes as passing or turning lanes at crossings.
- Encourage people to drive slowly through crossings when parked vehicles are not present.
- Minimize pedestrian exposure to traffic by providing short crossing distances.
- Maximize pedestrian visibility to approaching drivers by allowing pedestrians to essentially walk into the street.
- Enable pedestrians to clearly communicate to approaching drivers that they intend to cross the street.

Note: Intersections near polling locations, parks, bus stops, schools, pools, and other places that tend to attract a high number of pedestrians and bicyclists of various ages and physical abilities should be studied for the potential to install curb extensions. Curb extensions should approach the curb at a 45 degree angle to allow for easier plowing and cleaning.



Curb extensions (green areas) shorten pedestrian crossing distance, and increase safety.

Curb extension at the Grant Street/Fourth Street Intersection in De Pere.

2.2 Network Treatments and Facilities

Developing a Continuous Sidewalk System

In addition to providing a place for people of all ages and physical abilities to travel safely, sidewalks are a place for friends and neighbors to interact with each other, for children to play, and for commerce to occur. Sidewalks also provide the "street life" that helps to enhance neighborhood security. For these and other reasons, Hobart should install sidewalks along its neighborhood roads. A process for accomplishing this is summarized in this section.

Require Sidewalks in all New Subdivisions

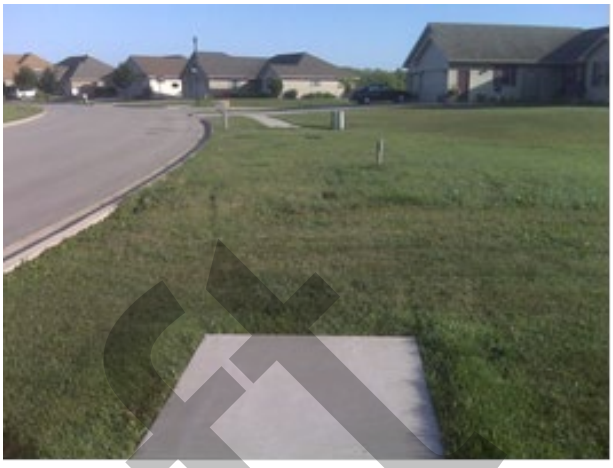
Hobart should begin the process of creating its comprehensive sidewalk system by requiring developers to install sidewalks on both sides of all streets in new subdivisions. Additionally, subdivisions that do not include sidewalks should not be approved. The only situation where sidewalks should not be required on both sides of a street is when physical or environmental constraints exist. In these situations, sidewalks should be required on at least one side of the street.

Install sidewalks along major streets and home-to-school walking routes

If Hobart wants to expand its sidewalk network, it should focus on working to install sidewalks along both sides of all existing home-to-school walking routes, collector and arterial streets, and connections to bus stops when or if the bus runs into Hobart. These sidewalks will enable children to walk outside of the driving area and provide people a safe place to walk along the streets that carry high volumes of traffic.

Require Sidewalks to be Installed When Streets Are Constructed

When constructing new streets, the village should require sidewalks as part of that initial construction. If sidewalks are not required until the time of occupancy permit issuance, network gaps will exist. Adding sidewalks at the time of street construction is less disruptive later.



Sidewalk system gap created by single vacant lot.

Sidewalks on only one side of the street.

Entire sidewalk network available from the start.

2.2 Network Treatments and Facilities

Engineering for the Bicycle

Engineering Considerations for Bicycle Infrastructure

The accommodation of bicycles should be considered during the planning, design, and construction or reconstruction of all transportation facilities in the street right-of-way. In addition, all streets should be made minimally acceptable for bicycling. Also, the village should provide pedestrian and bicycle facilities on all bridges, overpasses, and other transportation structures when constructing or reconstructing those facilities.

This plan recommends creating a system of bicycle corridors through a variety of different means. However, there are several design details that the village should observe on all streets to create a safe and efficient bicycle network. These design concerns are identified in the AASHTO *Guide for the Development of Bicycle Facilities*.

Drainage Grates

Drainage inlet grates and utility covers are potential problems for bicyclists when a new roadway is designed, and all such grates and covers should be kept out of a bicyclist's expected path. On new construction, curb inlets should be used when possible to minimize the exposure of bicyclists to grate inlets. It is important that grates and utility covers be flush with the surface, and this uniformity should be maintained when a road is resurfaced

Railroad Crossings

While there aren't currently any railroad tracks in the village, this should be considered in the event there ever are. When bikeways cross railroad tracks at grade, the crossing should ideally be at a right angle to the rails. When this is not possible, the approaching bicycle lane or shoulder should be widened to allow bicycles to cross the tracks at a right angle without veering into the traffic lanes. The width of these extended lanes should be eight feet if the right-of-way is available.

Parallel bar grates can be hazardous to bicyclists.

Perpendicular grates allow bikers to cross them safely.

Railroad crossing requires enough room for bicyclist to approach the tracks at 60-90 degrees.

2.2 Network Treatments and Facilities

Traffic Signal Timing

The Village of Hobart does not have traffic signals at this time. However, if in the future the village installs traffic signals, it is recommended that the signals be timed such that a bicyclists and or a pedestrian have ample time to traverse the intersection safely. The MUTCD should be consulted to determine traffic signal timing depending on the existing conditions at the intersection, and that the signals be timed such that a bicyclists and or a pedestrian have ample time to traverse the intersection safely.

Bicycle Facilities

Paved Shoulders

Paved roadway shoulders can create relatively safe bikeways on roads without curb and gutter. According to AASHTO, shoulders may be designated as bicycle facilities by signing and marking them for preferential use. AASHTO identifies the following guidelines for paved shoulders.

Appropriate Applications

- On roads without curb and gutter.
- On high speed, rural arterials that serve a high number of experienced cyclists when wide curb lanes are not practical.

Special Considerations

- Shoulders must be paved and maintained to an equivalent surface standard as regular travel lanes.
- Paved shoulders that are intended for bicycle use should continue through intersections and should not be routinely used as right turn lanes for vehicular traffic.
- Rumble strips should be placed in a manner that minimizes hazards to bicyclists and should not be extended across the shoulder area.
- Shoulders may be designated as lanes for preferential bicycle use through appropriate signage and pavement markings if they meet the recommended AASHTO width of four feet or greater.

Paved shoulder. Source: Cornell Local Roads Program.

Paved shoulder with rumble strip. Source: *Small Town and Rural Multimodal Networks*, U.S. DOT FHWA..

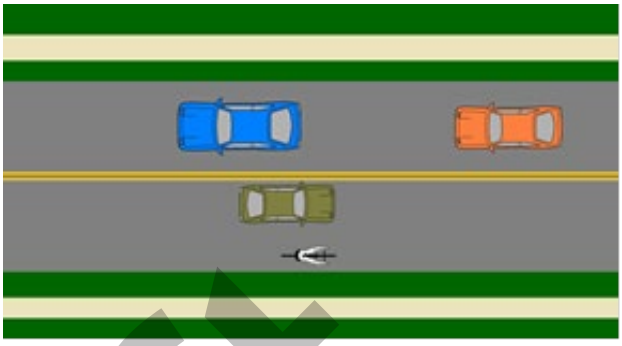
Roads with shoulders less than four feet wide normally should not be signed as bikeways. In situations where motor vehicle speeds exceed 35 mph and/or the percentage of trucks, buses, and recreational vehicles is high, additional width is desirable. Paved shoulders also improve bicyclist and driver safety and cost less than gravel shoulders to maintain.

2.2 Network Treatments and Facilities

Wide Curb Lanes

On street segments without bicycle lanes, a wide right lane can accommodate both bicycles and motor vehicles. In many cases where there is a wide curb lane, motorists will not need to change lanes to pass a bicyclist. Also, more maneuvering room is provided when drivers are exiting from driveways or in areas with limited sight distance.

In general, 15 feet of useable lane width is desired. Useable width would normally be from curb face to lane stripe or from edge line to lane stripe, but adjustments need to be made for drainage grates, parking, and longitudinal joints between pavement and gutter sections. However, widths greater than 15 feet may encourage the undesirable operation of two motor vehicles in one lane, especially in urban areas.



Wide, unmarked curb lanes allow motorists room to safely pass. Source: Brown County Planning Commission.

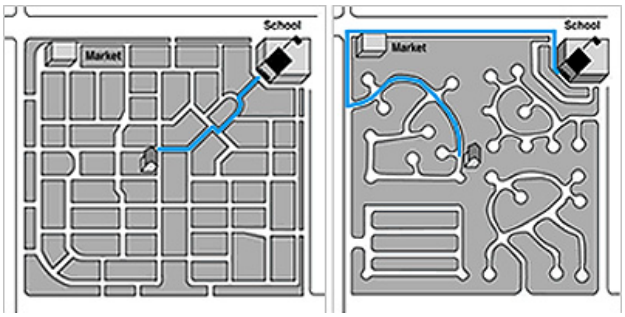
Provide Bicycle and Pedestrian Connections when Cul-De-Sacs are Necessary

If streets cannot be connected, the village should require the designation of public rights-of-way at or near the end of the cul-de-sacs, horseshoe roads, and other streets for multi-use paths that connect to neighboring subdivisions, schools, parks, and other destinations.

Walkway connection to VFW Park from Seventh Street in De Pere.

Developed Well-Connected Street Systems

To enable and encourage people to walk and bicycle throughout the village and to adjacent communities, Hobart should require well-connected street patterns within new developments that have frequent connections to the existing street system. The village should avoid cul-de-sacs and loop streets when physical or environmental constraints do not exist, but if these constraints prohibit street connections, the village should permit the development of cul-de-sacs only near the constraints.



Travel route for well-connected street grid vs. cul-de-sac developments, Source: Safe Routes to Schools.

2.2 Network Treatments and Facilities

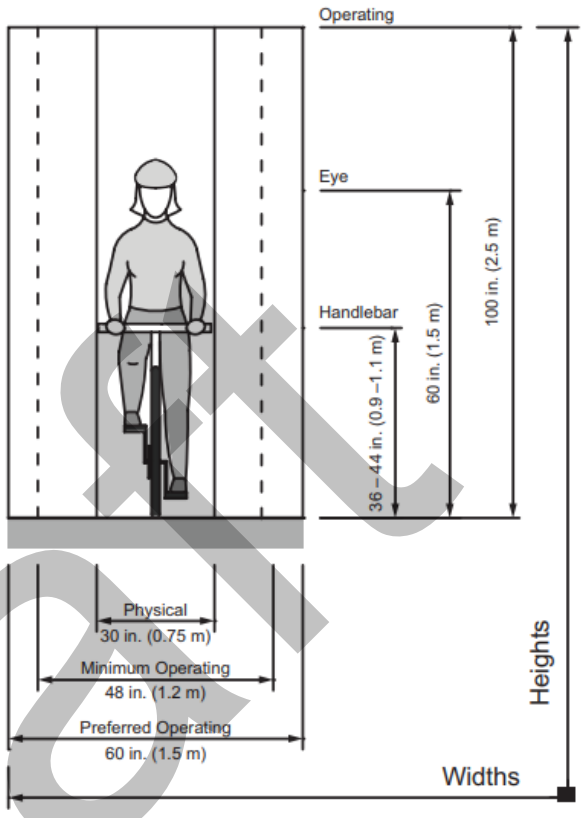
Bicycle Lanes

Bicycle lanes are designated portions of a roadway that are striped and marked for bicycle use. Some bicycle lanes may use signs in coordination with painted markings but signs are not required for the designation of bicycle lanes. These facilities, which should be at least four feet wide excluding the curb and gutter, are added to a road for the following purposes:

- To improve conditions for cyclists of all abilities within a given corridor.
- To encourage increased bicycle use on a given roadway by providing a greater degree of comfort and perceived safety for less skilled cyclists.
- To provide for more predictable movements by cyclists and motorists.
- To establish an overall channeling effect and promote an orderly flow of traffic.

The addition of bicycle lanes is appropriate in the following situations:

- When it is desirable to delineate the right-of-way assigned to cyclists and motorists to provide for more predictable movements by each.
- Where significant bicycle demand is desired or expected on arterial streets and roadways, which are generally defined as having average daily traffic flows that exceed 10,000 or average vehicle speeds that exceed 30 mph.
- When a community wants to encourage bicycle use on a particular facility.
- On streets where lane designation is not complicated by frequent roadway intersections and commercial driveways.



Bicyclist operating space for typical adult on upright bicycle. Source: *AASHTO Guide for the Development of Bicycle Facilities.*

5′ bike lanes provide sufficient room for cyclists to maneuver.

2.2 Network Treatments and Facilities

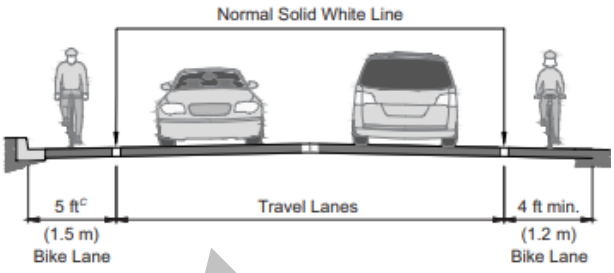
- On streets with heavy bicycle traffic where cyclists must frequently pass each other traveling in the same direction.
- When the route is anticipated to serve a high number of less experienced adult, child, and recreational bicyclists.

Bicycle lanes should always be one way facilities that carry traffic in the same direction as adjacent motor vehicle traffic. Two way bicycle lanes on one side of the roadway are unacceptable because they promote riding against the flow of motor vehicle traffic. Wrong-way riding is a major cause of bicycle crashes and violates the rules of the road stated in the Uniform Vehicle Code. In addition, bicycle lanes on one-way streets should be on the right side of the street except in areas where a bicycle lane on the left will decrease the number of conflicts.

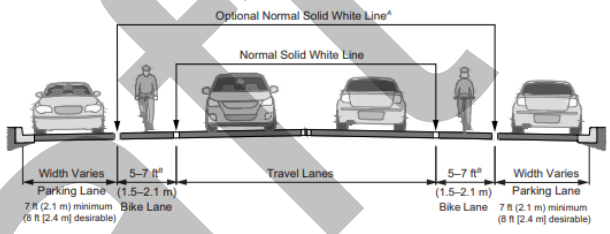
Incorporation with Parking Lanes

Bicycle lanes should always be placed between the parking lane and the motor vehicle lanes. Bicycle lanes between the curb and the parking lane can create obstacles for bicyclists and reduce visibility at intersections and driveways. These lanes can also prohibit bicyclists from making left turns. The placement of bicycle lanes between the driving and parking lanes (right) is an important component of many of the corridor recommendations.

Where parking is permitted but a parking lane is not provided, a combination lane that is at least 12 feet wide could be installed that accommodates motor vehicle parking and bicycle use (second image from top in adjacent column). However, if it is likely the combination lane will be used as an additional motor vehicle lane, it is preferable to designate separate parking and bicycle lanes. In both instances, an additional one or two feet of width is desirable if parking volumes are substantial or turnover is high.



Typical bike lane cross section without parking. Source: Planning Commission. *AASHTO Guide for the Development of Bicycle Facilities.*



Typical bike lane cross section with parking. Source: Planning Commission. *AASHTO Guide for the Development of Bicycle Facilities.*

Bike lanes and parking lane contrast with the roadway, further delineating the spaces. Golden, CO.

Parking lane is designed to include the car door, limiting the chance of a cyclist hitting an open door.

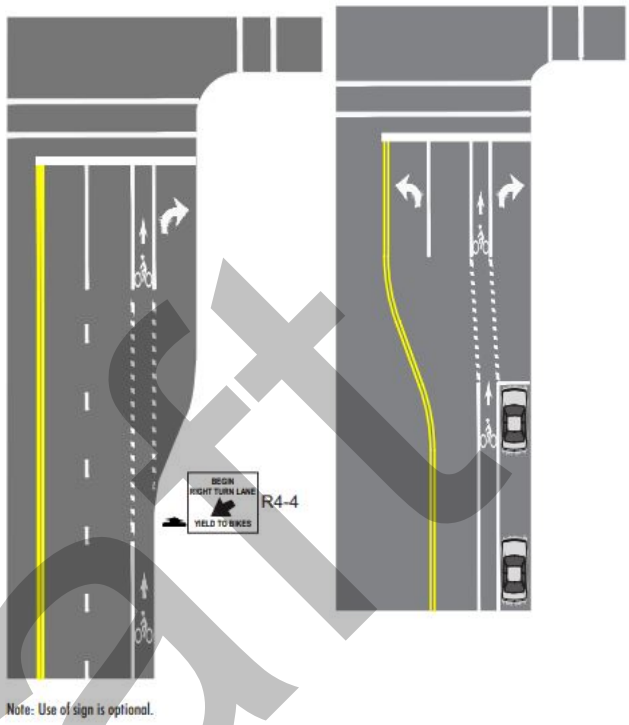
2.2 Network Treatments and Facilities

Intersections with Bicycle Lanes

Bicycle lanes tend to complicate bicycle and motor vehicle turning movements at intersections. Because they encourage bicyclists to keep to the right and motorists to keep to the left, both operators are somewhat discouraged from merging in advance of turns. As a result, some bicyclists will begin left turns from the bicycle lanes and some motorists will begin right turns from the left of the bicycle lane. Both maneuvers are contrary to the established rules of the road and can result in conflict.

At intersections, bicyclists proceeding straight through and motorists turning right must cross paths. Striping and signing configurations that encourage these crossings in advance of the intersection are preferable to those that force the crossing in the immediate vicinity of the intersection. To a lesser extent, the same is true for left turning bicyclists; however, in this maneuver, most vehicle codes allow the bicyclist the option of making either a "vehicular style" left turn (where the bicyclist merges leftward to occupy the same lane used for motor vehicle left turns) or a "pedestrian style" left turn (where the bicyclist proceeds straight through the intersection, turns left at the far side, and proceeds across the intersection again on the cross street). Examples of these turning situations can be found in Appendix B.

Where there are several left turning bicyclists, a separate turning lane should be considered. The design of bicycle lanes should also include appropriate signing at intersections to reduce the number of conflicts. General guidance for pavement marking of bicycle lanes is contained in the MUTCD. In addition, adequate pavement surfaces, bicycle-safe grate inlets, safe railroad crossings, and traffic signals responsive to bicycles should always be provided on roadways where bicycle lanes are being designated. Raised pavement markings and raised barriers can cause steering difficulties for bicyclists and should not be used to delineate bicycle lanes.



Bike lane with a right turn lane at the intersection (left), and an intersection with a bike lane and on-street parking (right).

Bike lane with a right-turn lane and on-street parking.

2.2 Network Treatments and Facilities

Colored Bicycle Lanes and Bike Boxes

Colored bike lanes have been a feature of bicycle infrastructure in the Netherlands (red), Denmark (blue), France (green) and many other countries. In the United Kingdom, both red and green pigments are used to delineate bike lanes and bike boxes.

The use of colored bicycle lanes attempts to "highlight" the potential areas of conflict between cyclists and drivers and warn both that the potential for conflict is approaching. A number of cities around the United States have incorporated colored bike lanes into their bicycle systems, and the colored bike lanes have shown decreases in crashes and increases in overall safety. The use of colored bike lanes also encourages new riders to use the bike lanes, which empowers more people to use this form of transportation.

The purpose of colored bicycle lanes is as follows:

- To help define cyclist and motorist rights-of-way.
- To create awareness for both the motorist and cyclist that an area of conflict is approaching.

This plan recommends that the Village of Hobart consider incorporating colored bike lanes into the design and implementation process. The following examples are areas where a colored bike lane would be appropriate:

- Along any designated bike lane, and more specifically, at intersections that contain right turn lanes.
- Provide bicycle boxes at intersections that are highly traveled by cyclists.
- Odd intersections (any intersection that is not a typical 3 or 4 way stop) along any existing or proposed bike lane. This includes intersections that have approaching lanes and an angle of greater or less than 90 degrees to the cross street.

Green markings to highlight bike lane adjacent to back-in on-street parking. Denver, CO.

Green markings for bike lane as it crosses intersection. Golden, CO.

Bike lane with a bike box to let bicyclists queue in front of turning vehicles.

2.2 Network Treatments and Facilities

Bicycle Paths and Multi-use Paths/Trails

In transportation planning, off-road bicycle facilities are referred to as bicycle paths. However, any path that is open for public use is also likely to be popular with walkers, joggers, in-line skaters, wheelchair users, and others. As a result, bicycle paths have come to be called multi-use trails (also referred to here as sidepaths). In either case, these facilities are typically 10 to 12 foot two-directional trails that are separated from the roadway and designed for the exclusive use of bicycle and other non-motorized transportations modes.

The purposes of multi-use trails/sidepaths are as follows:

- To serve as significant generators of bicycle use, especially for less skilled bicyclists.
- To provide enjoyable recreational opportunities as well as desirable commuter routes.
- To provide system continuity and linkage in areas where no on-street facilities are available.

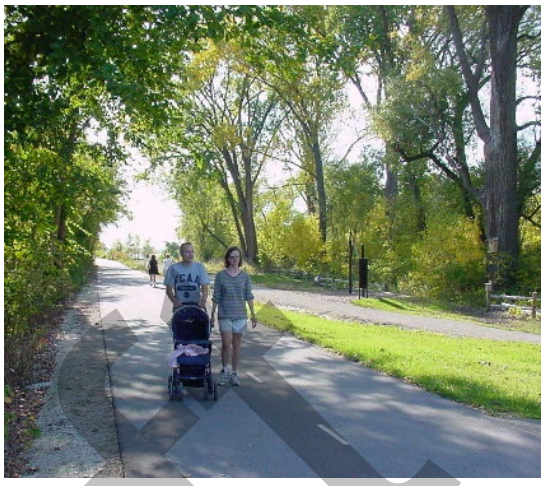
This plan recommends the development of multi-use trails along rail corridors that are proposed for abandonment ("rails to trails" projects), along utility easements, and as sidepath projects when sidepaths are found to be suitable.

In the image on the right, where a minimum of 5' unpaved separation cannot by provided (top), a physical barrier may be used between the sidepath and the roadway (center). In extremely constrained conditions for short distances, on-roadway rumble strips my be used as a form of separation (bottom).

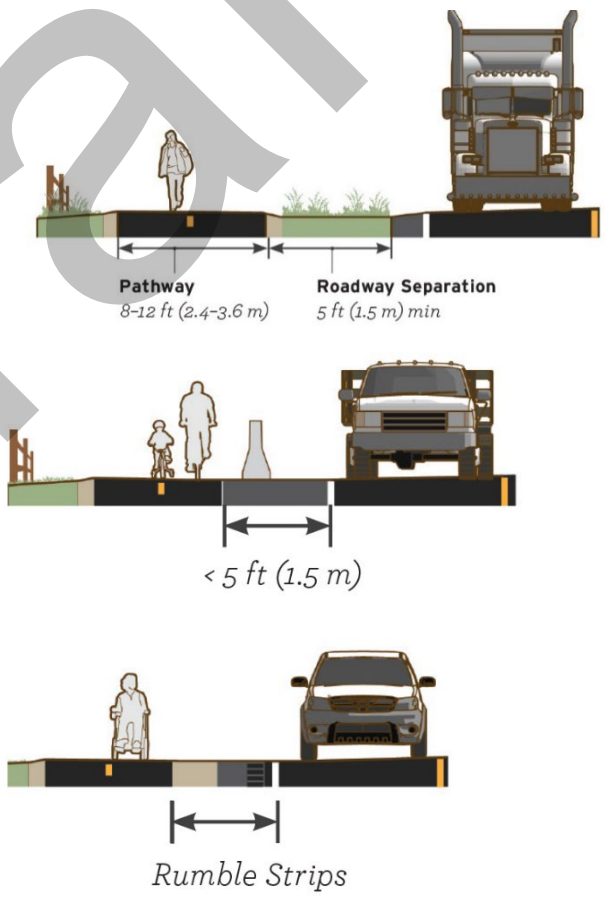
Some of the benefits of multi-use sidepaths are:

- They help complete a network where high-speed roads are the only corridors available.
- They encourage bicycling and walking in areas where traffic speed might otherwise discourage it.
- They help preserve rural character through maintaining narrower paved roadway width, and when combined with vegetation, help physically separate the sidepath from the roadway.

The primary consideration for sidepaths are that they require a wider roadside environment to provide for separation, unless other treatments are provided.



Fox River State Trail.



Different sidepath design options for separation. Source: Small Town and Rural Multimodal Networks, U.S. DOT FHWA.

2.2 Network Treatments and Facilities

Sidepath Suitability

A method of estimating the relative safety of bicyclists on trails (or paths) that run parallel to streets was developed by the League of Illinois Bicyclists (LIB). This "Sidepath Suitability Index" is designed to enable communities to rate the safety of existing parallel paths, determine if a new path would be an appropriate option, and identify methods for making existing or planned paths as safe as possible. Appendix I has a more detailed explanation of the algorithm, and specific Hobart examples.

To assess the suitability of placing a path along a road segment, the following factors are considered:

- **Intersection traffic**, which considers vehicle volumes, vehicle speeds, the number of driveway and street intersections, and other conditions.
- **Path continuity**, which measures the impact of gaps (unpaved areas, etc.) that exist along the path.
- **Curb cuts**, which considers whether or not curb cuts exist at street and driveway crossings.
- **Pedestrian use**, which considers the level of pedestrian use and the conflicts that exist or could exist between walkers and bicyclists.
- **Crosswalks**, which measures the visibility of crosswalks at intersections.
- **Separation between intersections and sidepaths**, which considers the proximity of the path's intersection and driveway crossings to the parallel road.

Each of these factors is assessed and scored, and the final score is used to determine the overall suitability of the path by comparing the score to the categories shown in the table at the bottom of the right column.

If the Village of Hobart intends to emphasize the construction of parallel paths, it is important that those who will be involved in developing these paths carefully consider where the paths should and should not be built. The following two examples illustrate how the suitability index works.

Example 1: *A street segment with very few access points that has curb cuts and highly visible crosswalks at intersections. The sidepath crosswalks are close to the parallel street at the crossings, and pedestrian use of the path is moderate.*

After completing an analysis, this segment's suitability rating was found to be 4, which falls within the Most Suitable category. This result suggests that a path along this segment that includes the features summarized in Example 1 would be acceptable.

Example 2: *A street segment that intersects often with commercial driveways and streets. This segment has curb cuts and highly visible crosswalks at street intersections. The sidepath crosswalks are close to the parallel street at the street intersections, but the driveway crossings are not close to the parallel street. Pedestrian use of the path is moderate here as well.*

After completing an analysis, this segment's suitability rating was found to be 11, which falls within the Least Suitable category. This result suggests that a path along this segment that includes the features summarized in Example 2 would not be as safe as on-street bicycle lanes because of the relatively high number of street and driveway crossings and the possibility that drivers will not see oncoming bikers because the drivers will tend to look for gaps in traffic instead of bicyclists on the path.

In situations where parallel multi-use paths are found to fall within the Not Suitable or Least Suitable categories, the village should strongly consider adding on-street bicycle lanes and sidewalks instead of the paths. The village should also consider choosing on-street lanes and sidewalks over multi-use paths in situations where the parallel paths fall within the Somewhat Suitable category. However, if the community still wants to build paths when undesirable conditions exist, they should try to maximize the paths' suitability by minimizing the number of conflict points and making the paths as visible as possible to drivers.

Sidepath Suitability	Points
Most Suitable	0-7
Somewhat Suitable	8-9
Least Suitable	10-11
Not Suitable	12+

2.2 Network Treatments and Facilities

Bicycle Routes

When providing a connection between bicycle facilities, a bicycle route can be relatively short or it could continue for several miles. Bicycle routes of any length should use a standard bicycle route sign while longer bicycle routes should use a marker with a numerical designation in accordance with the MUTCD. The number may correspond to a parallel highway, indicating the route is a preferred alternative route for bicyclists. It is often desirable to use supplemental plaques with bicycle route signs or markers to display distance and destination information.

Most bicycle routes in this plan are relatively short. For short segments standard bicycle route signs should be sufficient. However, the drainage grates, pavement, and other road characteristics along these routes should be corrected as necessary to safely accommodate bicycles. For the longer bicycle routes, and for the specific neighborhood connecting routes, wayfinding signage will be useful. The example sign to the right displays the standard route sign with a simple text sign below directing the user to a destination.

Source: Town of Ledgeview.

Wayfinding for Bicycle Routes

Using a comprehensive wayfinding system, a community may identify its preferred bicycle routes and destinations along them, and encourage cycling by familiarizing riders with the network and making it easier for them to reach preferred destinations. The three types of bicycle wayfinding signs are:

- **Confirmation signs** reassure bicycle riders that they are on a designated route, and to make motorists aware they are driving along a route they can expect to encounter bicyclists.
- **Turn signs** indicate where a bike route turns onto a new street, or when the rider has reached a particular destination.
- **Decision signs** inform riders of different options they have from a given point, and may provide additional information such as time and/or distance.

While wayfinding signs will need to adhere to specific placement standards, individual communities have flexibility for the signage design elements.

Pavement marking may also be installed along routes to help reinforce routes and directional signage.

MUCTD guide signs for bicycle route navigation, including confirmation sign (top), turn sign (middle), and decision sign (bottom). Source: Small Town and Rural Multimodal Networks, U.S. DOT FHWA.

Examples of possible pavement markings. Source: Alta Planning, Wayfinding Design.

2.2 Network Treatments and Facilities

Lighting

Fixed-source lighting improves visibility along paths and at intersections. In addition, lighting allows the bicyclist to see the path direction, surface conditions, and obstacles. Lighting for shared use paths is important and should be considered where night usage is expected such as paths servicing college students or commuters and at highway intersections. Lighting should also be included in underpasses and tunnels or when nighttime security could be an issue. Depending on the location, average maintained horizontal illumination levels of 5 lux to 22 lux should be used. Where special security problems exist, higher illumination levels may be considered. Light standards (poles) should meet the recommended horizontal and vertical clearances. Luminaries and standards should be at a scale appropriate for a pedestrian.

Top two images: examples of lighting along paths.

Lighting technology has also improved through LEDs, resulting in more efficient lighting systems. Adaptive lighting technology also allows for more fine-tuning of lighting for a specific area, and for lighting levels that can adjust depending on ambient lighting and other factors.

Utilize a Complete Streets Approach to Develop Policies That Guide Street Design and Construction

The State of Wisconsin made modifications to State Statute 84.01(35) which was known as the "Complete Streets Law". Despite the changes, communities are still required to give "due consideration" to providing bicycle and pedestrian accommodations in projects that utilize state or federal monies. Brown County and all Brown County communities are encouraged to develop roadway design policies that utilize complete streets principles to ensure that bicyclists, pedestrians, and motorists can be safely and conveniently accommodated on all streets. The communities should also work with the state and county to ensure that state and county highways in the metropolitan area are built and rebuilt to safely and conveniently accommodate all transportation modes.

Views of 2nd Street in Milwaukee, before and after "complete streets" improvements.: Source: Wisconsin Bike Fed.

2.2 Network Treatments and Facilities

Shared Lane Pavement Marking a.k.a. Sharrows

Shared lane pavement markings (or "sharrows") are bicycle symbols carefully placed to guide bicyclists to the best place to ride on the road, avoid car doors, and remind drivers to share the road with cyclists. Unlike bicycle lanes, sharrows do not designate a particular part of the street for the exclusive use of bicyclists. They are simply a marking to guide bicyclists to the best place to ride and help motorists expect to see and share the lane with bicyclists.

What do sharrows mean for motorists and bicyclists?

Motorists:

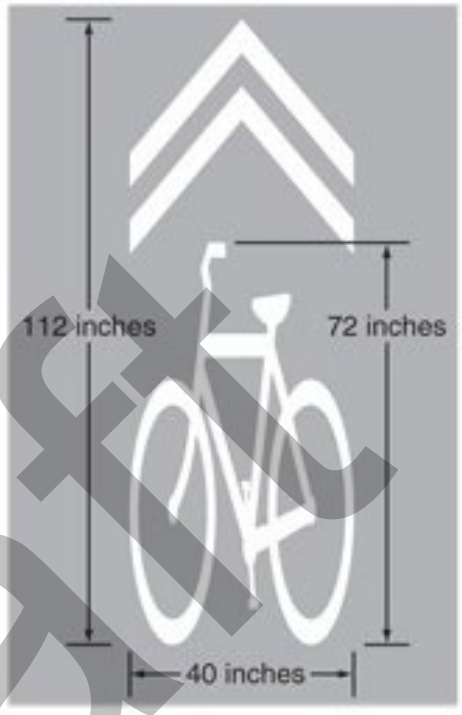
- Expect to see bicyclists on the street.
- Remember to give bicyclists three feet of space when passing.
- Follow the rules of the road as if there were no sharrows.

Bicyclists:

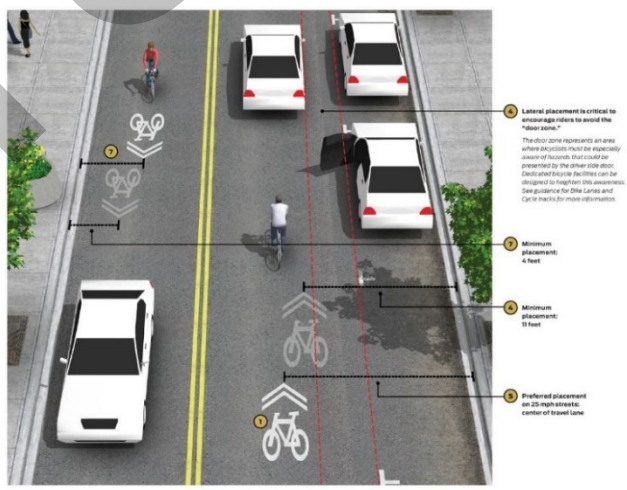
- Use the sharrow to guide where you ride within the lane.
- Remember not to ride too close to parked cars.
- Follow the rules of the road as if there were no sharrows.

While properly-placed sharrows do provide benefits, they should not be considered a substitute for bike lanes or other separation treatments where those types of facilities are otherwise warranted or space permits.

The NACTO Urban Bikeway Design Guide recommends placing shared lane markings, or sharrows, every 250 feet or more on low-traffic streets. Another placement consideration is how difficult it is for bicyclists to maintain the proper travel path; for these and higher traffic streets, placement more frequently (every 50 to 100 feet) may be necessary.



Standard Shared Lane Marking from the MUTCD.



Design guidance for shared lane markings. On streets with no parking, markings should be far enough into the street to direct bicyclists away from gutters, seams, and other obstacles (left lane). Where parking is present, the markings should be laterally far enough into the lane to stay out of the "door zone" (right lane). Source: *Urban Bikeway Design Guide*, National Association of City Transportation Officials.

2.3 Programs and Operation - Education

The success of any bicycle and pedestrian program hinges upon educating the general public and public officials of the rights and rules that apply to these transportation modes. This education process includes learning where problems exist through the collection of accurate crash statistics, teaching children and adults proper methods of operating bicycles in traffic, and increasing motorist awareness of cyclists and pedestrians.

Crash Reporting

Police officers are currently required to complete a form when a crash involves a motor vehicle or the damage associated with a crash exceeds a certain cost. As a result of this policy, many bicycle crashes are not reported. To improve the information available for monitoring bicycle crashes, all incidents involving bicycles should be reported and placed on file.

Bicycle and Pedestrian Education Programs

Several methods should be used to educate people about the rights and responsibilities of cyclists and pedestrians. Examples of these methods are below.

- Hillcrest Elementary and any future primary schools should incorporate bicycle safety into the physical education curriculum. The local law enforcement agency could donate bicycles to be used in the physical education classes and could also offer to have an officer attend class and speak about the law and safety.
- Bicycle and pedestrian training should be offered to all law enforcement officers and included in driver's education courses. This would result in an increased level of awareness by law enforcement personnel and young motor vehicle operators
- Send monthly or quarterly press release and public service announcement series on bicycle safety to local media.
- Bicycle education programs should be sponsored by law enforcement agencies, bicycle shop owners, bicycle clubs, communities, media groups, or other interested groups and individuals. Typically, a bicycle education program includes small seminars and demonstrations on bicycle maintenance, safe riding, and the rules of the road. It is important to extensively advertise these programs and to staff them with knowledgeable people.
- Community service programs would be effective in educating children and adults. Special presentations at schools, bicycle education programs, and education and enforcement programs have been helpful in many communities. For example, a spokesperson from a local law enforcement agency could talk to classes or entire schools about bicycle and pedestrian rules and safety.
- Village law enforcement officers can help with driver education through running "Operation Frogger" exercises. Law enforcement officers work with adult volunteers, and monitor vehicular traffic for how well they stop for pedestrians. Officers will issue warnings and citations, if warranted, for drivers that do not properly yield to the volunteer pedestrians.

Regardless of the program or programs chosen by the county or its communities, the primary goal should be the establishment of policies and ordinances that promote safe and effective bicycling and walking. Educating the public about these policies and ordinances is the key to reaching the desired goals of any program.

Bicycle education is for people of all ages. The left image shows a bicycle education and skills course for children, while the right shows an adult bicycling class.

2.3 Programs and Operation - Education

Pedestrian and Bicycle Signage

Develop a Pedestrian Crosswalk Sign Placement Policy

The Yield to Pedestrians in Crosswalk signs are becoming increasingly common and they are often installed after a difficult or dangerous crossing situation is observed and reported. Instead of reacting to problems, the village should identify crosswalks where these signs would be beneficial and place the signs in the crosswalks before receiving requests. An example of where signs could be placed is at all intersections that have crossing guards, and these signs could remain when school is not in session so drivers are constantly reminded that they need to yield to pedestrians at these intersections.

Install Share the Road with Bicycles Signs Along Bicycle Routes and Other Streets Where Bicycling is Common

The Village of Hobart should consider installing "Share the Road with Bicycles" signs along its signed bicycle routes and on other streets where bicycling is common to remind drivers to look for bikes and remind bicyclists that they belong on the street.

Install Signs at Controlled Intersections that Remind Drivers to Look for Crossing Pedestrians

A number of pedestrian crash reports from around the county stated or suggested that drivers did not see the pedestrians before hitting them. In many cases, it appears that drivers did not see pedestrians crossing at intersections because the drivers were looking for gaps in traffic prior to making turns.

To remind drivers that pedestrians could be present, signs should be posted at controlled intersections that tell drivers to look for crossing pedestrians before proceeding. The signs should be posted at the intersections where pedestrians were hit, and this program should be extended in the future to other intersections that are identified as potential hazards for pedestrians.

Signage helps remind drivers that pedestrians and bicyclists may be present.

2.3 Programs and Operation - Enforcement

Bicyclists are subject to the same rules of the road and privileges of operation as motorists and are expected to follow these rules. However, adult bicyclists often disregard traffic regulations thereby setting a poor example for young riders. This perpetuates the view that bicycles are toys rather than a legitimate mode of transportation. Motorists also often fail to follow basic rules of the road and fail to understand bicyclists' rights and responsibilities. This results in dangerous situations for bicyclists and other road users and discourages many people from using bicycles for transportation.

Motorists and bicyclists are responsible for knowing and following the rules of the road. It is necessary for an enforcement program to allow bicyclists and motorists to be reprimanded for dangerous behavior and, if necessary, have their privileges revoked. Failure to follow the rules is often a result of people not knowing the rules or thinking that the rules do not apply to them. However, everyone must follow the rules in order to prevent crashes and allow for the safe and efficient movement of traffic.

Law Enforcement Education

Brown County and its communities rely on the local police departments and the Brown County Sheriff's Department to keep our communities safe. One of the aspects of the community that is often overlooked is the enforcement of the laws governing pedestrians and cyclists. This is often a result of the police officers not knowing those particular laws well enough for them to be consistently enforced. It should be a priority of all law enforcement agencies in Brown County to further their education in bicycle and pedestrian laws by attending the Wisconsin Pedestrian and Bicycle Law Enforcement Training course or other similar classes.

Police officer assisting with bicycle safety training. Source: Oregon Police Department, Village of Oregon, WI.

Bicycle and Pedestrian Law Enforcement/Education Program

This program is designed to boost the level of enforcement exhibited toward cyclists while at the same time educating people about the safe and proper use of a bicycle on the road. This program would encourage police officers to issue citations to motorists, bicyclists, and pedestrians that are committing infractions. Each community could develop and hold a bicycle and pedestrian safety class similar to the class attended by drivers looking to reduce the number of points deducted from their driver's license after committing a traffic violation. This class could be held once a month to provide an opportunity for the offenders to gain a better understanding of bicycle and pedestrian scenarios and laws. The person receiving the citation will have the option of attending this class to reduce or eliminate the fine or if the offender chose not to attend the class, a fine commensurate with the violation shall be issued.

Develop a Pedestrian and Bicycle Law Enforcement Plan for the Village

The police department, in collaboration with village staff, should develop a bicycle and pedestrian law enforcement plan that identifies additional enforcement activities, training opportunities, and other actions that will help to achieve the plan's goal of developing a walking and bicycling culture in the village.

Treat Enforcement Actions as Education and Outreach Opportunities

As Hobart's pedestrian and bicycle systems continue to be developed and residents are being educated on how to use them properly, the police department should support these efforts by enforcing the rules of the road as they apply to drivers, pedestrians, and bicyclists. These enforcement activities should initially be treated as education outreach programs where officers see offenses, stop the offenders, explain what they did wrong, and give them a leaflet or other piece of literature. The department could issue citations for serious violations and repeat offenses, but most ticketing should not occur until after the outreach element has been in place for several months.

2.3 Programs and Operation - Encouragement

Special events have been proven effective in inspiring students, parents, elected officials and school leaders to try something new, which often results in the development of ongoing programs to encourage walking and bicycling. Walk to School Day and Bike to School Day are some of the most popular events taking place at schools across the country each year .

The village may also implement specific design tools that help improve safety and convenience for pedestrians and bicyclists.

Bicycle Parking

The provision of bicycle parking facilities is essential in the effort to promote bicycling, for people are discouraged from bicycling if adequate parking is not available.

Bicycle parking needs vary by type, duration of use, and location. The Association of Pedestrian and Bicycle Professionals (APBP) developed the *Essentials of Bike Parking*, which is designed to provide guidance for governments and businesses that are planning to purchase or install bicycle parking fixtures. The following are suggested performance criteria for bicycle parking racks in *Essentials*.

- Supports bike upright without putting stress on wheels.
- Accommodates a variety of bicycles and attachments
- Allows locking of frame and at least one wheel with a U-lock.
- Provides security and longevity features appropriate for the intended locations.
- Rack use is intuitive.

Bicycle parking can function as street art (top), as street as architectural elements along the street (middle), and secured bicycle storage (bottom).

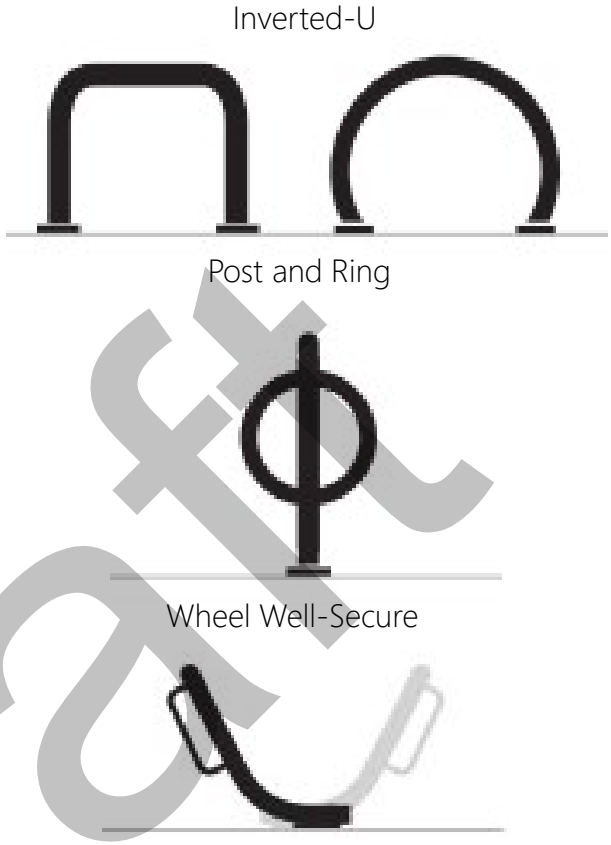
2.3 Programs and Operation - Encouragement

Bicycle Parking Standards

The APBP recommends using the bicycle racks to meet the parking performance criteria; however, they also recommend that a rack be tested before committing to a mass installation project. While there are different bike rack types, the three bicycle parking examples on the right, when properly designed and installed, typically meet all performance criteria and are appropriate for use in nearly any application. Other types of bicycle parking may work in certain instances, but are not considered ideal from performance concerns.

The proposed bicycle corridor system presented in this document is designed to provide direct connections to several activity centers in the village However, this system will not be very attractive to cyclists if their destinations lack secure bicycle parking facilities. The provision of bicycle parking by schools, businesses, commercial establishments, local governments, and other major destinations is one of the most significant incentives for people to use bicycles.

The generally accepted bicycle parking requirements for several destinations are listed



Bicycle parking can function as street art (top), as street as architectural elements along the street (middle), and secured bicycle storage (bottom).

Table 3: Bicycle Parking Space Requirements

Type of Establishment	Minimum # of Parking Spaces
Primary or Secondary School	10% of the number students plus 3% of the number of employees
College or University Classroom	6% of the number of students plus 3% of the number of employees
Dorms, Fraternities & Sororities	1 space per 3 students
Shopping Center	5% of the number of automobile spaces
Commercial Street	1 space per 3,000 sq. ft. of commercial space
Sport and Recreational Center	12% of the number of automobile spaces
Office Building	10% of the number of automobile spaces
Government Building	10% of the number of automobile spaces
Movie Theater or Restaurant	5-10% of the number of automobile spaces
Manufacturing Plant	4% of the number of automobile spaces
Multi-Unit Housing	1 space per 2 apartments
Public Transit Station (Transitway)	20 spaces minimum
Other Land Uses	**5-10% of the number of automobile spaces**

Source: Bicycle Facility Planning: A Resource for Local Governments, American Planning Association.

2.3 Programs and Operation - Encouragement

Mix Compatible Land Uses to Enable and Encourage Walking and Biking

The Village of Hobart currently allows mixing compatible land uses (residential, commercial, research and institutional, parks, open space, retail, and hospitality) in the Planned Development Districts for Centennial Centre and Orlando/Packerland. Mixing land uses increases the number of destinations that can be easily reached by pedestrians and bicyclists. The village should continue to focus on these locations by incorporating the appropriate types of transportation facilities to allow the area to be as accessible as possible to the surrounding areas.

Centennial Centre conceptual design. Centennial Centre was envisioned to mix different uses, and that vision is already being realized. The development will serve as a model for both mixed-use design, and for the village.

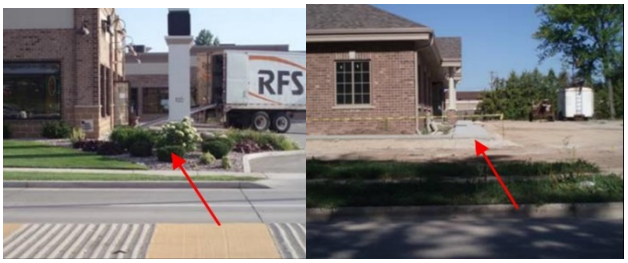
Require Bicycle and Pedestrian-Friendly Site Designs and Direct Walkway Connections between Buildings and Sidewalks

To enable and encourage people to travel to and within the mixed use areas proposed in Hobart, the Village should consider modifying its Zoning Ordinance in Planned Development Districts (Chapter 295, Articles XIII, XIV, and XV) to ensure that new and redevelopment projects have buildings with zero or minimal setbacks, parking along the side or in the rear, and other similar features. Requiring direct walkway connections to the sidewalk and between buildings will ensure that pedestrians are able to easily access the site. Code revision examples are also found in the following *Recommendations* section.

The store on the left is more difficult for pedestrians and bicyclists to reach because the building is at the rear of the parking lot. The store on the right is more easily accessible because its entrance is immediately adjacent to the sidewalk.

Maintaining Pedestrian and Cycling Facilities

Pavement surface irregularities can do more than cause an unpleasant ride. For example, gaps between slabs or overlay faults that run parallel to the direction of travel can trap a bicycle wheel and cause a fall, and holes and bumps can cause bicyclists to swerve into the path of motor vehicle traffic as they attempt to avoid these hazards. Therefore, the pavement along the recommended bicycle corridors should be maintained to avoid these problems. This could involve filling joints, adjusting utility covers, and possibly resurfacing streets to make them suitable for bicycling. Uneven sidewalks with gaps or ledges also pose hazards for pedestrians. The village should ensure a way is in place to report any hazards for repair.



Both buildings have good placement directly adjacent to the sidewalk and the street, but no direct sidewalk connection.

2.3 Programs and Operation - Encouragement

Organize Walk and Bike to School Days

To educate students and their parents about safe walking and bicycling practices and encourage parents to allow their children to frequently walk and bike to school, the village should work with the Pulaski School District to organize walk and bike to school days at some or all of the schools within the districts. These events could be held in October to coincide with international walk and bike to school day events, and the National Center for Safe Routes to School has a number of resources available to help make programs like this a success.

Other Encouragement Methods

In addition to bicycle parking facilities, there are several other improvements that complement bicycle paths and roadway improvements. These include:

- Rest areas on long, uninterrupted bicycle paths. These facilities have been installed along the Fox River Trail and the Mountain Bay Trail.
- The placement of bicycle racks on Green Bay Metro buses. In 2007 Green Bay Metro installed bicycle racks on its fixed route buses that serve a number of metropolitan communities. This program has been successful and based on the recorded number of bicycles on buses; Green Bay Metro has considered adding bicycle capacity to the bike racks. While the Village of Hobart is outside the Green Bay Metro service area, people would be able to ride to the west side of Green Bay, Ashwaubenon, or West De Pere and take the bus from that location.
- Bicycle corridor maps. Maps can help bicyclists navigate corridors and locate parking and other transportation facilities. Maps can also provide information about the rules of the road and bicycle safety tips. Brown County Planning most recently updated the bicycle map in 2013. Mobile application and mapping software have made it possible to develop a mobile bicycle map which could be developed in the future.
- Working in coordination with Google Maps to provide information about bicycle lanes, bicycle routes, and recreational trails for the new bicycle route mapping option provided by Google.
- Work with local bike clubs, cycling teams, and other organizations to help promote cycling and serve as an educational resource for people who are learning about cycling in the area.

Children walking to school in the Village of Allouez.


Rest area and bicycle repair stand along the Fox River Trail.

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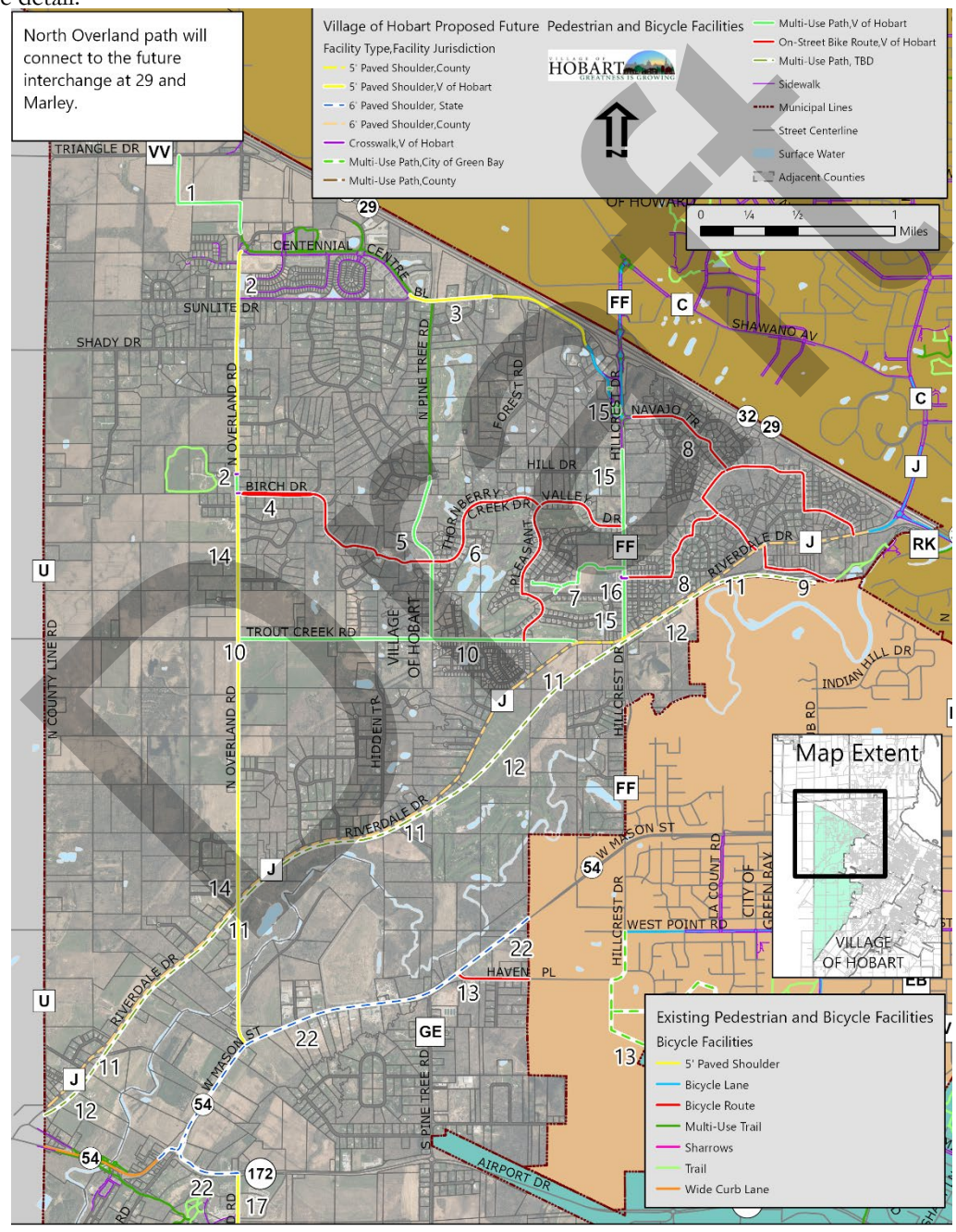
3. Recommendations and Implementation

3.1 Network and Infrastructure Recommendations

Proposed Pedestrian and Bicycle Facilities – Northern Hobart

With the bulk of village growth happening in the northern half, the village has a number of opportunities to create important connections between different residential areas, and to Centennial Centre. While physical terrain is a constraint, the village has seen enough development, and focused development energy on the north side to warrant creating a pedestrian and bicycle network for residents to move around safely. Since this area has a number of low-traffic residential streets, Hobart has an opportunity to build some momentum with some relatively small improvements. Please see the reference table on the following pages for more detail.



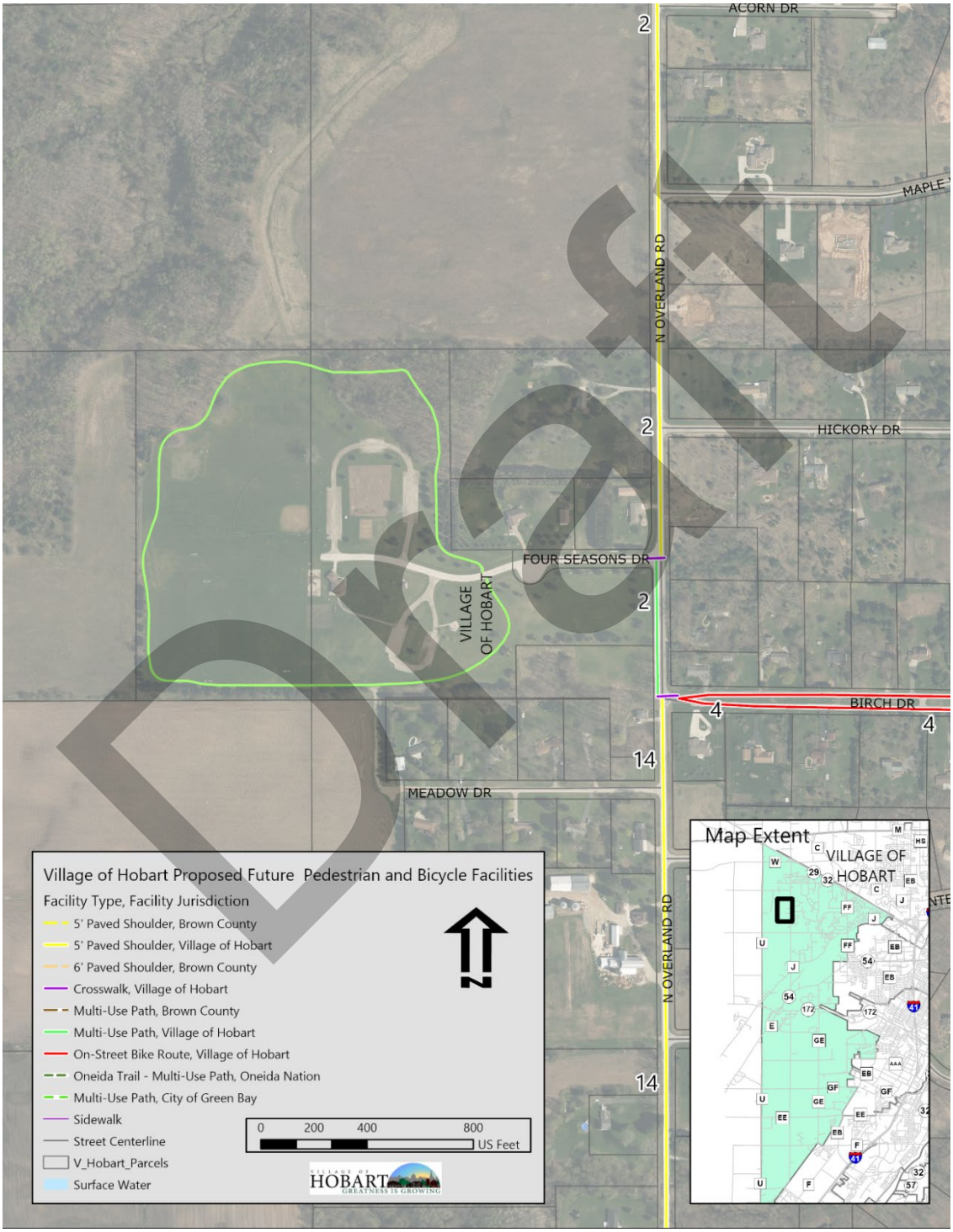
3.1 Network and Infrastructure Recommendations

Proposed Pedestrian and Bicycle Facilities – Northern Hobart

Map Point	Location	Termini	Implementation Method	Priority	Justification
1	North Overland Road	Multi-use path at Larsen Orchard Parkway to future walkway at the end of N Overland and STH 29.	Paved shoulder	Medium	This will complete the gap along North Overland from Centennial Centre to the Village of Howard. Future road work on Marley Street is currently proposed to have pedestrian and bicycle accommodations along it.
2	North Overland Road	Intersection of Birch Drive and N Overland to Centennial Centre Blvd.	Paved shoulder	High	The segment will complete a critical link between Centennial Centre and Four Seasons Park. The segment should accommodate paved shoulders along most of it. The physical terrain over Trout Creek will present challenges, and may require a different treatment, like sharrows on the downhill sections, but connecting the park to the village's major population center is worth the effort. The village should also enhance the connection from Birch Drive to Four Seasons Drive, including a crosswalk, in order to promote safety and usage both to and from the Birch Drive route.
3	Centennial Centre Boulevard	End of paved shoulder on Centennial Centre to Sunlite Drive	Paved Shoulder	High	This road segment is very narrow, and a lot of people travel on this between Centennial Centre and Hillcrest Drive. Additional room would at least more comfortable accommodate pedestrians and bicyclists.
4	Birch Drive	Intersection of Birch Drive and N Pine Tree Road	Bicycle route with markings/signage	High	Birch Drive is a relatively low-traffic street that could provide a critical east-west connection between Hillcrest Drive and N Overland. While not all the terrain may be most ideal for a bicyclist, the street should have lower vehicular speeds on it.
5	North Pine Tree Road	Sunbeam Circle to Trout Creek Road	Multi-use Path	Medium	Since North Pine already has a multi-use path along it, this extension would provide a complete link from Centennial Centre to Trout Creek. The "medium" priority is because of lower residential density and traffic volume (compared to other streets) through the segment . **This connection was also identified in the 2016 Brown County Bicycle and Pedestrian Plan.**

3.1 Network and Infrastructure Recommendations

Proposed Pedestrian and Bicycle Facilities – Northern Hobart – Four Seasons Park



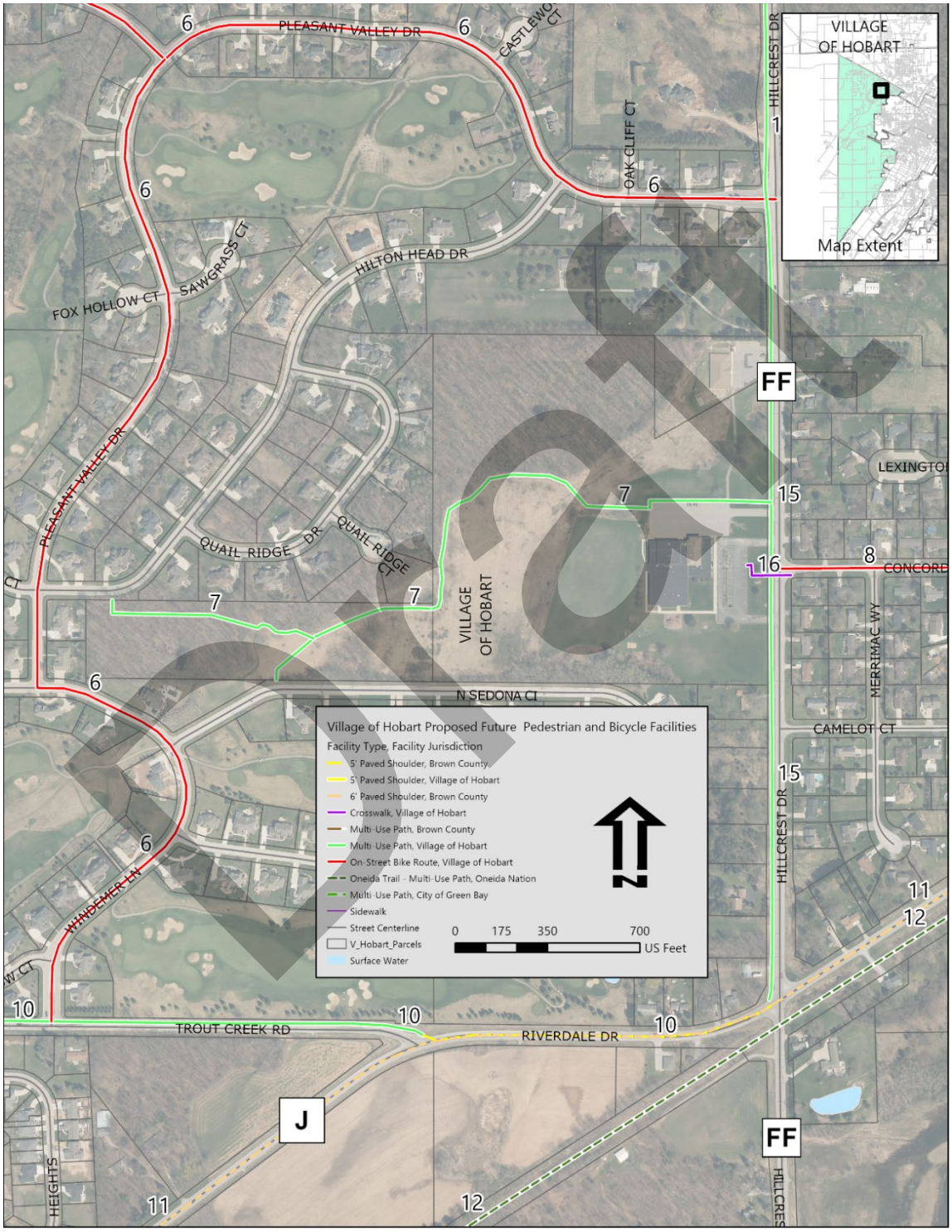
3.1 Network and Infrastructure Recommendations

Proposed Pedestrian and Bicycle Facilities – Northern Hobart

Map Point	Location	Termini	Implementation Method	Priority	Justification
6	Thornberry Creek /Pleasant Valley	Thornberry Creek Drive from N Pine Tree, connecting to Pleasant Valley Drive, and ending at Hillcrest Drive; Pleasant Valley south via Windemer Lane to Trout Creek.	Bicycle route with markings and signage	High	The two sections of street in Thornberry Creek could provide a designated route that connects Hillcrest Drive to Pine Tree Road by using low-traffic streets. This could also be implemented more quickly and for lower cost than any other treatment type.
7	Hillcrest Elementary Trail	N Sedona Circle to Hillcrest Drive, with an extension also from Hilton Head Drive.	Multi-use Path	High /medium	Creating a multi-use trail on village property would provide a link from the Thornberry Creek area directly to Hillcrest Elementary, and open up walking possibilities for students in that area. Also paired with bike routes east of Hillcrest Drive, this could help create a longer pedestrian and bicycle route through the Village. This area also already has desire paths established from people walking through it.
8	Neighborh-ood east of Hillcrest Drive	Connections from Hillcrest Drive at two points, to Riverdale Drive at two points.	Bicycle route with markings and signage.	High	Establishing a signed route in this area would help promote walking and biking. Because of the curvilinear streets and residential character, this area could more easily accommodate on-street bicyclists and pedestrians because of slower, low traffic volumes. These routes will provide a connection through the neighborhood, and complement the crosswalk by Hillcrest Elementary,.
9	Park Drive	Intersection of Riverdale Drive and Hazel Road to end of Park Drive	Bicycle route with markings and signage	Medium	This segment would provide a connection from the neighborhood on the north side of Riverdale Drive to connect with Pamperin Park, and points beyond.
10	Trout Creek Road	Hidden Trail to CTH J	Multi-use Path	Medium	This would create a linkage to the future residential area immediately to the west, and connect that to Pine Tree, and the potential future trail. **This connection was also identified in the 2016 Brown County Bicycle and Pedestrian Plan.**

3.1 Network and Infrastructure Recommendations

Proposed Pedestrian and Bicycle Facilities – Northern Hobart – Hillcrest/Thornberry Area



3.1 Network and Infrastructure Recommendations

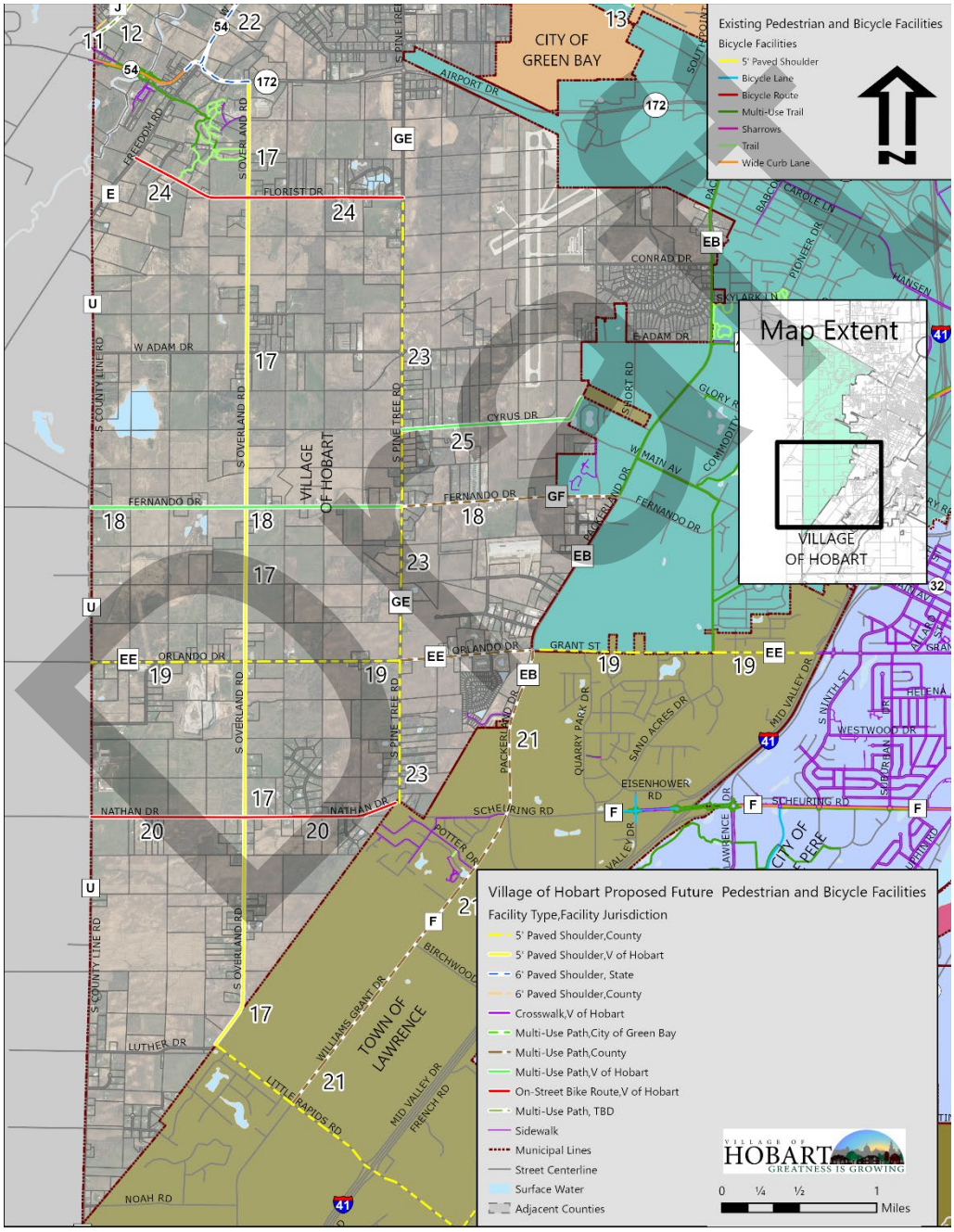
Proposed Pedestrian and Bicycle Facilities – Northern Hobart

Map Point	Location	Termini	Implementation Method	Priority	Justification
11	CTH J (Riverdale Drive)	Intersection of Riverdale and CTH RK to CTH U.	Paved shoulder	Lower	This county facility represents an opportunity to enhance an east-west connection. Currently CTH J has a paved shoulder, but it is narrower than the recommended minimum of four feet. The pavement condition is also good enough that there are no planned improvements for this segment at this time. The village should work with the county when that time does come to realize those improvements.
12	Abandoned Rail Line	City of Green Bay line to county line.	Multi-use path	Medium	This rail line would provide an uninterrupted, traffic-separated link from east to west. The City of Green Bay has also identified this rail line in it's 2019 Green Bay Safe Walk and Bike Plan. The village should be a partner in realizing this project, and connect bicycle and pedestrian routes to it and the existing trail in Outagamie County.
13	Haven Place	W Mason Street to village/City of Green Bay line.	Bicycle route with markings and signage	Lower	This segment is identified because Haven Place goes into Green Bay and connects to West Point Road, which has bicycle lanes along it. The Green Bay plan also identifies a future multi-use trail around He Nis Ra Park.
14	North Overland Road	Intersection of Birch Drive and N Overland to W Mason Street.	Paved shoulder	Lower	The village should consider adding a paved shoulder, and using combination of treatments to identify that bicyclists and pedestrians travel along it.
15	Hillcrest Drive North	600 feet north of Hill Drive to intersection of Hillcrest Drive and Riverdale Drive.	Multi-use path and trailhead	Medium	This segment should connect to the existing multi-use path along Hillcrest Drive, completing the segment south to Riverdale Drive. The village also has an opportunity to locate a trailhead on village-owned property just north of the intersection of Centennial Centre Blvd and Hillcrest Drive.
16	Hillcrest Elementary	From Hillcrest Elementary to Concord Way.	Crosswalk	High	This connection should be the village's highest priority to begin improving pedestrian and bicycle connectivity.

3.1 Network and Infrastructure Recommendations

Proposed Pedestrian and Bicycle Facilities – Southern Hobart

The village's south side is more rural in character, but that is also changing with more residential development along the village's border with the Town of Lawrence. The village should focus on creating connections to Lawrence, Ashwaubenon, and Green Bay, and further enhancing a north-south connection with South Overland when it needs future work. Currently these roads see relatively low traffic volumes compared to the north side, but that will change as development in this general area continues. Please see the reference table on the following page.



3.1 Network and Infrastructure Recommendations

Proposed Pedestrian and Bicycle Facilities – Southern Hobart

Map Point	Location	Termini	Implementation Method	Priority	Justification
17	South Overland Road	STH 172 to Little Rapids Road	Paved shoulder	Lower	This segment will complete the gap along North Overland from Centennial Centre to the Village of Howard. Future road work on Marley Street is currently proposed to have pedestrian and bicycle accommodations along it.
18	Fernando Drive/CTH GF	CTH U to S Pine Tree Road	Multi-use path	Medium	This segment would further help establish an east-west route on the village's south side. The village should at least start with identifying this as a route. The segment is already used by bicyclists, and this designation would help solidify that. The village should also work with Brown County on future improvements to CTH GF. **This connection was also identified in the 2016 Brown County Bicycle and Pedestrian Plan.**
19	Grant Street/Orl-ando Drive/ CTH EE	CTH EB/ Packerland Drive to Mid Valley Drive	Paved shoulder • CTH U to CTH GE/Pine Tree Multi-use path • CTH GE/Pine Tree to CTH EB/Packerland	Medium High	This is the most critical connection point on the south side of the village. Hobart should work with Brown County, Lawrence, Ashwaubenon, and De Pere to make this connection so all the communities have pedestrian and bicycle connections linking them together. Further west, Orlando Drive is already being used as an east-west connector, and it links the Tailwind Subdivision to the Packerland multi-use trail, and beyond The village should work with other jurisdictions to improve these facilities and enhance the connections. **The 2016 Brown County Bicycle and Pedestrian Plan identifies a future multi-use trail on CTH F/CTH EB from Grant Street south to Little Rapids Road.**
20	Nathan Drive	CTH U to S Pine Tree Road	Bicycle route with markings and signage	Medium	This segment is also already used by bicyclists as an east-west route, and would also help further establish a bicycle and pedestrian presences on the village's south side. This route will also connect to other recommended future facilities. **The 2016 Brown County Bicycle and Pedestrian Plan identifies a future multi-use trail on CTH F/CTH EB from Little Rapids Road to Grant Street.**
21	Packerland Drive (Village portion)	Little Rapids Road to Grant Street	Multi-Use Path	Medium	**The 2016 Brown County Bicycle and Pedestrian Plan identifies a future multi-use trail on CTH F/CTH EB from Little Rapids Road to Grant Street.**
22	STH 172 – STH 54/W Mason St.	STH 172 west to W Mason St.; 172/Airport Dr. north to City of Green Bay	8' Paved Shoulder	Medium	These two sections would help bridge a direct connection at the gap between South Overland Road and North Overland Road, where STH 172 and STH 54/West Mason Street meet. Enhancements along West Mason would then also tie into Haven Place, which meets Hillcrest in the City of Green Bay.

3.1 Network and Infrastructure Recommendations

Proposed Pedestrian and Bicycle Facilities – Southern Hobart

Map Point	Location	Termini	Implementation Method	Priority	Justification
23	South Pine Tree Road	Florist Drive to Nathan Drive	Paved shoulder	Medium	This connection will tie together the east-west routes of Florist Drive, Cyrus Drive, Fernando Drive, Orlando Drive, and Nathan Drive, and will be the second north-south route in the village's southern half. Coupled with South Overland Drive, this would create a nice natural loop for the village.
24	Florist Drive	CTH E/Freedom Road to South Pine Tree Road	Bicycle route	High	Florist Drive will connect to the pedestrian trail east of Freedom Road, and be the first east-west connection between South Overland Road and South Pine Tree Road. The low-traffic character of the street makes it suitable for signage and route markings, and implemented more easily.
25	Cyrus Drive	South Pine Tree Road to Cypress Road	Multi-use path	Medium	The village has an opportunity to connect to the residential area to the east , creating another connection between Ashwaubenon and the Village of Hobart. The connection to South Pine Tree will tie into the larger network.

3.1 Network and Infrastructure Recommendations

Proposed Revisions to the Village of Hobart Zoning Code

Addition to Chapter 295-122 (General Provisions for Centennial Centre at Hobart District)
295-122 I. Bicycle and Pedestrian Connectivity. To enable and encourage people to walk and bicycle to, from, and within Centennial Centre, the village shall require street patterns within new developments that have connections to the existing street system. If streets cannot be connected due to physical or environmental barriers, the village shall require the designation of public rights-of-way at or near the end of cul-de-sacs, horseshoe roads, and other streets for multi-use paths that connect to neighboring subdivisions, schools, parks, and other destinations.

Addition to Chapter 295-139 (Site Plan Review for Centennial Centre at Hobart District – Design Objectives)
295-139 B. (7) To enable and encourage people to easily and safely travel to, from, and within Centennial Centre on foot, by bicycle, and by vehicle.

Addition to Chapter 295-309 F. (Off-Street Parking Standards) – Addition in Bold Italics
295-309 F. Parking areas may be located in any yard space for commercial uses; ***however, uninterrupted walkways shall be provided between the commercial uses and adjacent sidewalks or trails to allow pedestrians to safely access the uses without crossing the parking areas.*** Parking areas may be located in any yard but the front yard for other uses. Parking spaces and areas shall not be closer than 10 feet to any street line or within five feet of a property line in a side yard.

Addition to Chapter 295-353 A. (Site Review/Development and Design Standards – Objectives) – Addition in Bold Italics
295-353 A. Provide for safe and efficient vehicular, pedestrian, ***and bicyclist circulation***.

Addition to Chapter 295-362 A. (Off-street parking requirements in B-1, B-2, I-1, I-2 and R-4, R-5, and R-6 Districts) – Addition in Bold Italics
295-362 A. Location. All parking spaces required to serve employees and visitors of buildings erected or established after the effective date of this chapter shall be located on the same zoning lot as the building or use served. Off-street parking areas may be located in the front of the buildings in any district, with a minimum of 25 feet green space/open space from the property line. ***However, uninterrupted walkways shall be provided between the buildings and adjacent sidewalks or trails to allow pedestrians to safely access the buildings without crossing the parking areas.***

3.2 Program and Operational Recommendations

Include Bike Lanes in Planned Projects

Any new planned street construction or reconstruction in the village should include bicycle and pedestrian facilities, if they haven't been already. The cost of adding bicycle facilities would also be lower if they were included in construction or expansion projects because of the economy of scale. Essentially, it would be less expensive to add a few extra feet of pavement during a road project than it would to build bike lanes as stand alone projects.

Construction of Lanes as Conditions of Jurisdictional Transfers

If or when roads are being considered for transfer to other jurisdictions (county to town, state to county, etc.), each entity involved should examine the possibility of adding bicycle and pedestrian facilities as conditions of the transfer. This could save money by avoiding having to retrofit bicycle and pedestrian facilities in an area that was not planned to accommodate that type of infrastructure.

Education

The village can start building awareness around pedestrians and bicyclists by purchasing and incorporating signage to highlight key areas to expect those users, and to establish designated pedestrian/bicycle routes. The village can also partner with village law enforcement officers and Hillcrest Elementary to create and implement community educational opportunities.

Enforcement

The Hobart-Lawrence Police Department (HLPD) should establish a pedestrian and bicycle law enforcement/education program that anticipates new pedestrian and bicycle facilities. When the village installs new facilities, such as the potential crosswalk at Hillcrest Elementary, HLPD officers should assist in the rollout and enforcement early on to establish new patterns and travel habits.

Encouragement

As the village continues to have new development, it should work ensure that pedestrian and bicycle facilities are included. This may be done through code revisions, and also through the site review process.

3.3 Implementation and Evaluation

The completion of this plan should be celebrated as a significant milestone for the Village of Hobart. The goals, objectives, and recommendations that were created during the planning period provide guidance for the development and evaluation of new facilities, educational efforts, and other policies and programs. However, the key to any successful plan is the implementation of its recommendations and the evaluation of its successes and shortcomings.

The recommendations for the village are not intended to be implemented in one year. Some of the recommendations might take many years to be implemented due to limited funding, public works scheduling, or a variety of other factors. But other recommendations such as starting to designate pedestrian and bicycle routes, installing signage, and creating educational and outreach opportunities could be implemented more quickly.

Evaluation

Evaluation is the fifth "E" of Safe Routes to School planning, and it is a critical component of the program. For example, if/when a crosswalk is installed at Hillcrest Elementary, the village and school district should work together to survey students and families to see if their travel patterns to school have changed, and is having the desired effect of enabling and encouraging more students to walk and/or bicycle to school. Another evaluation method is to observe vehicle speeds in school zones and ask the crossing guards if they believe driver behavior has changed since after the educational and enforcement components have began.

3.4 Possible Funding Sources

The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) established several federal programs that could fund bicycle and pedestrian improvements on or near roads that are included on the federal functional classification system. Passed in 1998, the Transportation Equity Act for the 21st Century (TEA-21) sought to improve safety, protect public health and the environment, and create opportunity for all Americans. The Moving Ahead for Progress in the 21st Century Act (MAP-21) was signed into law in July of 2012. MAP-21 created a streamlined and performance-based surface transportation program and built on many of the highway, transit, bike, and pedestrian programs and policies established as part of ISTEA . In December of 2015 the Fixing America's Surface Transportation (FAST) Act was signed into law. This is the first federal law in over a decade to provide long-term funding certainty for surface transportation infrastructure planning and investment. The FAST Act maintains a focus on safety, keeps intact the established structure of the various highway-related programs, continues efforts to streamline project delivery and, for the first time, provides a dedicated source of federal dollars for freight projects. The FAST Act is important because it provides some level of funding certainty through 2020. Bicycle and pedestrian funding is estimated to be $800 million a year.

The following list of programs can support the development of a comprehensive bicycle and/or pedestrian network. Many of the bicycle facilities and multi-use trails in Brown County have been built using state or federal transportation grants from the following list.

Transportation Alternatives Program (TAP)

TAP provides funding for a variety of alternative transportation projects including construction, planning, and design of on-road and off-road facilities for pedestrians, bicyclists, and other non-motorized forms of transportation and safe routes to school programs and facilities. TAP grants for smaller communities located outside of the urbanized area are available through the state-wide TAP program (the Brown County Planning Commission, as the area's MPO provides the grants for the urbanized area). TAP grants can cover up to 80% of a project's cost.

Surface Transportation Block Grant (STBG)

The Fixing America's Surface Transportation (FAST) Act converts the long-standing Surface Transportation Program (STP) into the Surface Transportation Block Grant Program (STBG) acknowledging that this program has the most flexible eligibilities among all Federal-aid highway programs and aligning the program's name with how the Federal Highway Administration (FHWA) has historically administered it. The STBG promotes flexibility in State and local transportation decisions and provides flexible funding to best address State and local transportation needs. The STBG Program for the Green Bay Urbanized Area is administered by the Brown County Planning Commission as the area's MPO, and STBG funds can cover up to 80% of a project's cost. More information regarding the STBG program including funding details and eligibility can be found by visiting the FHWA webpage.

3.4 Possible Funding Sources

Surface Transportation Block Grant Program – Rural (STBG-Rural)
The STBG-Rural program allocates federal funds to complete a variety of improvements to rural highways(primarily county highways) that are located outside of urbanized areas. These projects must be used for streets classified as major collectors or higher., and these funds can cover up to 80% of a project's cost.

Safe Routes to School (SRTS) Program
The SRTS program is one of several programs under the Transportation Alternatives Program "umbrella". The SRTS program is specifically designed to improve walking and biking travel options, promote healthier lifestyles in children at an early age, and decrease auto-related emissions near schools. SRTS grants can cover up to 80% of a project's cost. Information about SRTS can be obtained from the Brown County Planning Commission or Wisconsin DOT.

Knowles-Nelson - Stewardship Program
The Wisconsin Legislature created the Knowles-Nelson Stewardship Program in 1989 to preserve valuable natural areas and wildlife habitat, protect water quality and fisheries, and expand opportunities for outdoor recreation. The conservation and recreation goals of the Stewardship Program are achieved through the acquisition of land and easements, development of recreational facilities (such as off-street trails), and restoration of wildlife habitat. Stewardship Program grants can cover up to 50% of a project's cost.

Brown County and the County's communities should continue to apply for funds from the Knowles – Nelson Stewardship Program to assist in funding the construction of off-street trail systems. Interested parties are encouraged to contact the Wisconsin Department of Natural Resources for information about the Stewardship Program.

Highway Safety Improvement Program (HSIP) (formerly the Hazard Elimination and Safety [HES] Program)
Hazard Elimination and Safety (HES) Program grants funded 90% of the cost of installing a roundabout at the intersection of Ninth and Grant Streets and safety improvements at Main Avenue and Ninth Street in De Pere. Safety funds were also used to install positive-offset left turn lanes on Ashland Avenue and STH 172 in Ashwaubenon, and other safety-related projects in the County have been funded through this program in the past. The County and the County's communities should continue to apply for federal safety funds through what is now the Highway Safety Improvement Program (HSIP) to correct safety problems while other grant programs through WisDOT's Bureau of Transportation Safety should also be investigated to address safety issues.

3.4 Possible Funding Sources

CMAQ Program

If Brown County is designated as an air quality non-attainment area in the future, the County and the County's communities should seek funds from the Congestion Mitigation and Air Quality (CMAQ) Program administered by WisDOT to implement projects that will improve the area's air quality.

PeopleforBikes - Community Grants

The PeopleforBikes Community Grant Program provides funding for important and influential projects that leverage federal funding and build momentum for bicycling in communities across the U.S. These projects include bike paths and rail trails, as well as mountain bike trails, bike parks, BMX facilities, and large-scale bicycle advocacy initiatives. For more information including application timelines and grant guidelines, visit the Peopleforbikes webpage: https://peopleforbikes.org/our-work/community-grants/.

4. Appendices

A. BICYCLE FACILITY DESIGN ELEMENTS

B. BICYCLE LANES AT INTERSECTIONS

C. BICYCLE AND PEDESTRIAN MARKINGS/SIGNAGE

D. SPEED MANAGEMENT

E. TRAILHEADS AND PLACEMAKING

F. COST ESTIMATES

G. IMPLEMENTATION COST ESTIMATES

H. POTENTIAL ENVIRONMENTAL PERMITTING REQUIREMENTS

I. SIDEPATH SUITABILITY INDEX EXAMPLES

Appendix A - Bicycle Facility Design Elements

General Roadway Improvements
The bicycle portion of the plan recommends that several lanes be placed throughout the Village of Hobart by various methods mentioned in the Recommendations and Implementation section. The plan also recommends the establishment of routes and construction of paths. When these bicycle facilities are developed, it is important that several design details be observed to make the new facilities as safe and user-friendly as possible. The following is a summary of the design elements that are recommended in the AASHTO Guide for the Development of Bicycle Facilities, the FHWA's Manual on Uniform Traffic Control Devices, and the FHWA's Selecting Roadway Design Treatments to Accommodate Bicyclists for different types of bicycle facilities.

Drainage Grates
- Curb inlets are preferred.
- Do not use a parallel-bar grate.
- Advance pavement markings are recommended.

Railroad Crossings
- Ideally, the bicycle lane should cross the railroad tracks at a 90 degree angle.
- The bicycle travelway should be widened if the angle is less than 45 degrees.
- Warning signs should not be less than 315 feet before the crossing.
- Pavement markings should not be less than 265 feet before the crossing.

Traffic Control Devices
- An intersection clearance interval should be a bicycle speed of 10 mph with a 2.5 second braking time.

Signage
- Signs should be situated between two and 12 feet from the edge of a road.
- Signs should be at least five feet off the ground.

Paved Shoulders
Shoulder Width
- A four foot paved shoulder is recommended for roads that carry traffic at or below 35 mph.
- Additional width is desired if speeds are greater than 35 mph.

Wide Curb Lanes - Right Hand Lane Width
- Minimum of 14 feet, 15 feet preferred.

Signage
- No signage is necessary for wide curb lanes but bicycle route signs should be considered.

Appendix A - Bicycle Facility Design Elements

Bicycle Lanes

Bicycle Lane Widths
- Bicycle lanes should be a minimum of four feet wide excluding the curb and gutter.
- Bicycle lanes next to parking lanes should be at least five feet wide.
- A bicycle lane that is combined with a parking lane should be at least 12 feet wide.

Lane Placement
- When parking is present, bicycle lanes should be placed between the driving lanes and parking lanes.

Signage
- Designated lane signs should be placed beside the road.

Colored Bike Lanes
- Colored bike lanes should be used at locations of high levels of bicycle traffic.
- Colored bike lanes are necessary at points of conflict between motor vehicles and bicycles.

Designated Bicycle Routes

Signage
- Signs should designate routes as well as markings (sharrows).

Bicycle Paths

Path Widths
- The width of a two-directional path should be a minimum of 10 feet.
- The width of a multi-use trail should be at least 12 feet.
- Sidewalk bike paths are not recommended.

Clearances
- The graded shoulder area of a path should be at least two feet on each side of the path.
- The path should be situated at least three feet from trees, poles, etc.
- The path's vertical clearance should be at least eight feet and 10 feet is desired.

Grades
- The longitudinal grade of a path should be no more than five percent.
- A path's grade on a cross slope should be at least two percent.

Design Speed
- The general design speed for a path is a minimum of 20 mph.
- The design speed should be at least 30 mph if a path's grade is greater than four percent.

Appendix A - Bicycle Facility Design Elements

Curves
- A path should have at least a 95 foot radius.
- A path's superelevation should be between two and five percent.

Stopping/Sight Distance
- Stopping and sight distances are grade and speed dependent.
- The minimum stopping and sight distance is 125 feet.

Pavement Structure
- Pavement structure is based on site conditions.

Intersections
- Path crosswalks could include diagonal or longitudinal lines to increase visibility.
- Bike crossing signs on rural roads should be placed 750 feet before the path crossing.
- Bike crossing signs on urban streets should be placed 250 feet before the path crossing.
- Ten foot paved aprons should be added on both sides of a path at gravel road intersections.
- Vehicular access should be limited.

Path Pavement Markings
- A four inch yellow line should be placed in the center of the path.
- Symbols or written messages should be placed before intersections.

Path Signage
- Signs should be situated between three and six feet from the edge of the path.
- Signs should be between four and five feet off the ground.
- Regulatory signs should be placed at the location where a regulation applies.
- Hazard warning signs should be placed at least 50 feet before a hazard.
- Railroad crossing signs should be placed at least 315 feet before a railroad crossing.
- Path signs do not have to be as large as bicycle signs along roads.

Appendix B - Bicycle Lanes at Intersections

Intersections with Right-Turn Lanes

The AASHTO Guide provides supplemental information about the design of bike lanes at intersections with right-turn lanes. The following diagram (1) illustrates typical bike lane design and pavement markings at a variety of intersection approaches. There are several possible approaches for bike lane design where these right-turn lanes are present (2). The most desirable configuration will depend on the local road cross section and turning vehicle traffic patterns.

Figure 9C-4. Example of Bicycle Lane Treatment at a Right Turn Only Lane

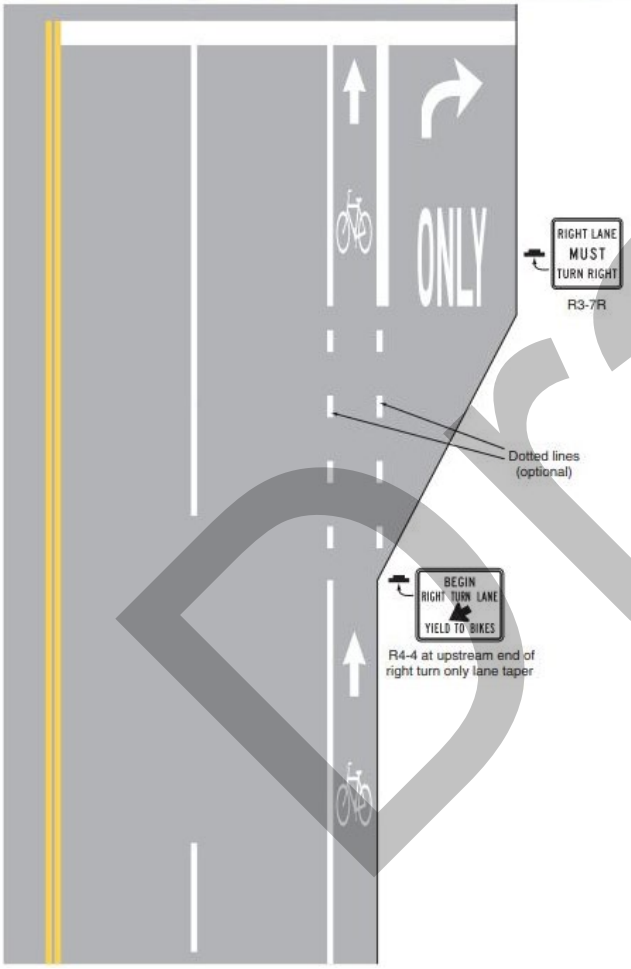
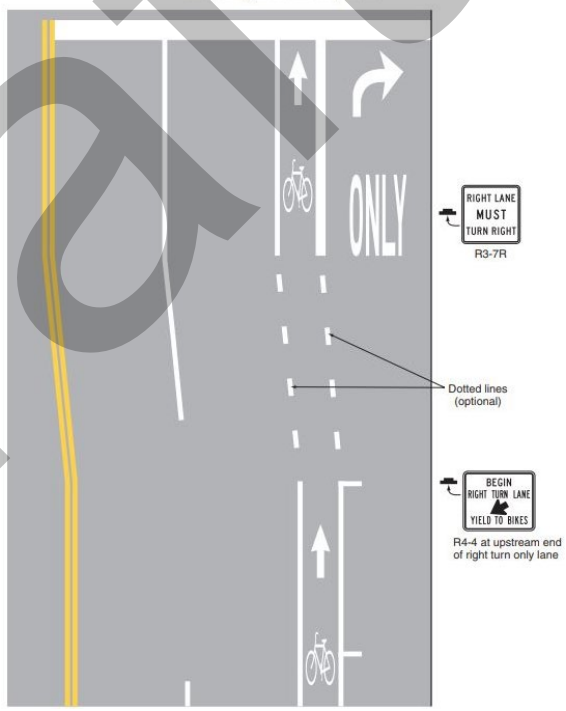


Figure 9C-5. Example of Bicycle Lane Treatment at Parking Lane into a Right Turn Only Lane



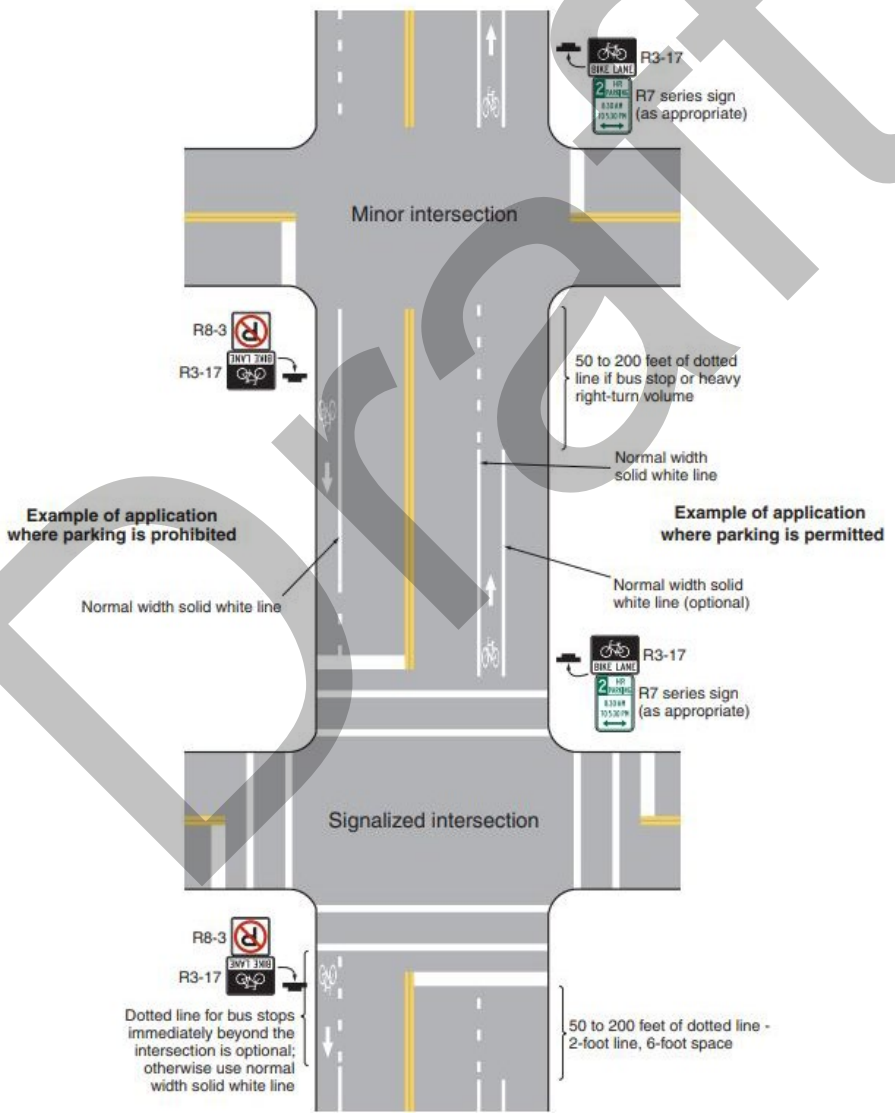
*Source: 2009 MUTCD, Chapter 9C, Markings. This chapter details general principles and standards to use for pavement markings.

Appendix B - Bicycle Lanes at Intersections

Bicycle Lanes at Intersections and Interchanges

At intersections and interchanges, bicyclists proceeding straight through and motorists making turns must cross paths. Lane striping and signing configurations that encourage crossings and merging in advance of the intersection are preferable to those that force a crossing or merging in the immediate vicinity of the intersection. The following diagram provides guidance on bike lane design issues at intersections and interchanges.

Figure 9C-6. Example of Pavement Markings for Bicycle Lanes on a Two-Way Street



*Source: 2009 MUTCD, Chapter 9C, Markings. This chapter details general principles and standards to use for pavement markings.

Appendix C - Pedestrian and Bicycle Signage Standards

Part 9 of the 2009 Manual on Uniform Traffic Control Devices (MUTCD) addresses traffic control for bicycle facilities. For the complete document, please refer to the current MUTCD edition with revisions.

Signage Standards

MUTCD section 9B addresses standard bike lane signing. Below are regulatory signs for bicycle facilities (including bike lanes). MUTCD also provides recommendations for warning signs and bicycle route guide signs. Key MUTCD signing principles for bicycle facilities are:

- Bicycle signs shall follow standard MUTCD conventions for shape, legend, and color.
- All signs shall be retroreflectorized.
- Where signs serve bicyclists and other road users, the size, vertical mounting height, and lateral placement shall be as specified for vehicle traffic applications.

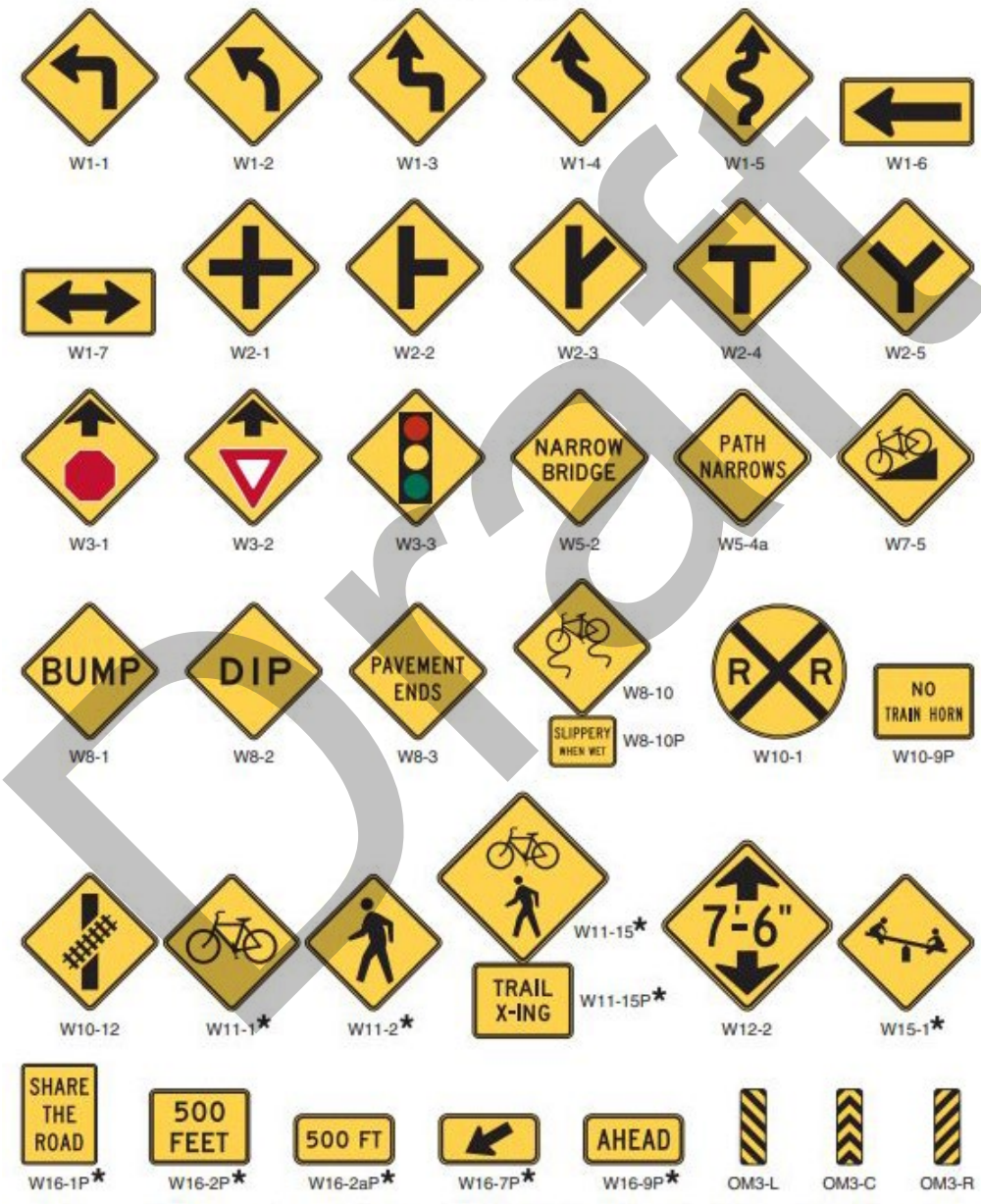
Figure 9B-2. Regulatory Signs and Plaques for Bicycle Facilities

Source: 2009 MUTCD, Chapter 9B, Signs. The MUTCD Table 9B-1 (pp. 791-792) contain the minimum sign and plaque size requirements for **shared-use paths only**. If the sign or plaque applies to motorists and bicyclists, the minimum size requirements are shown in Tables 2B-1, 2C-2, or 2D-1.

Appendix C - Pedestrian and Bicycle Signage Standards

The Figure 9B-3 below from the MUTCD show different warning signs for bicyclists regarding unexpected changes, and minimum required sizes are also listed in Table 9B-1 in the 2009 MUTCD*

Figure 9B-3. Warning Signs and Plaques and Object Markers for Bicycle Facilities



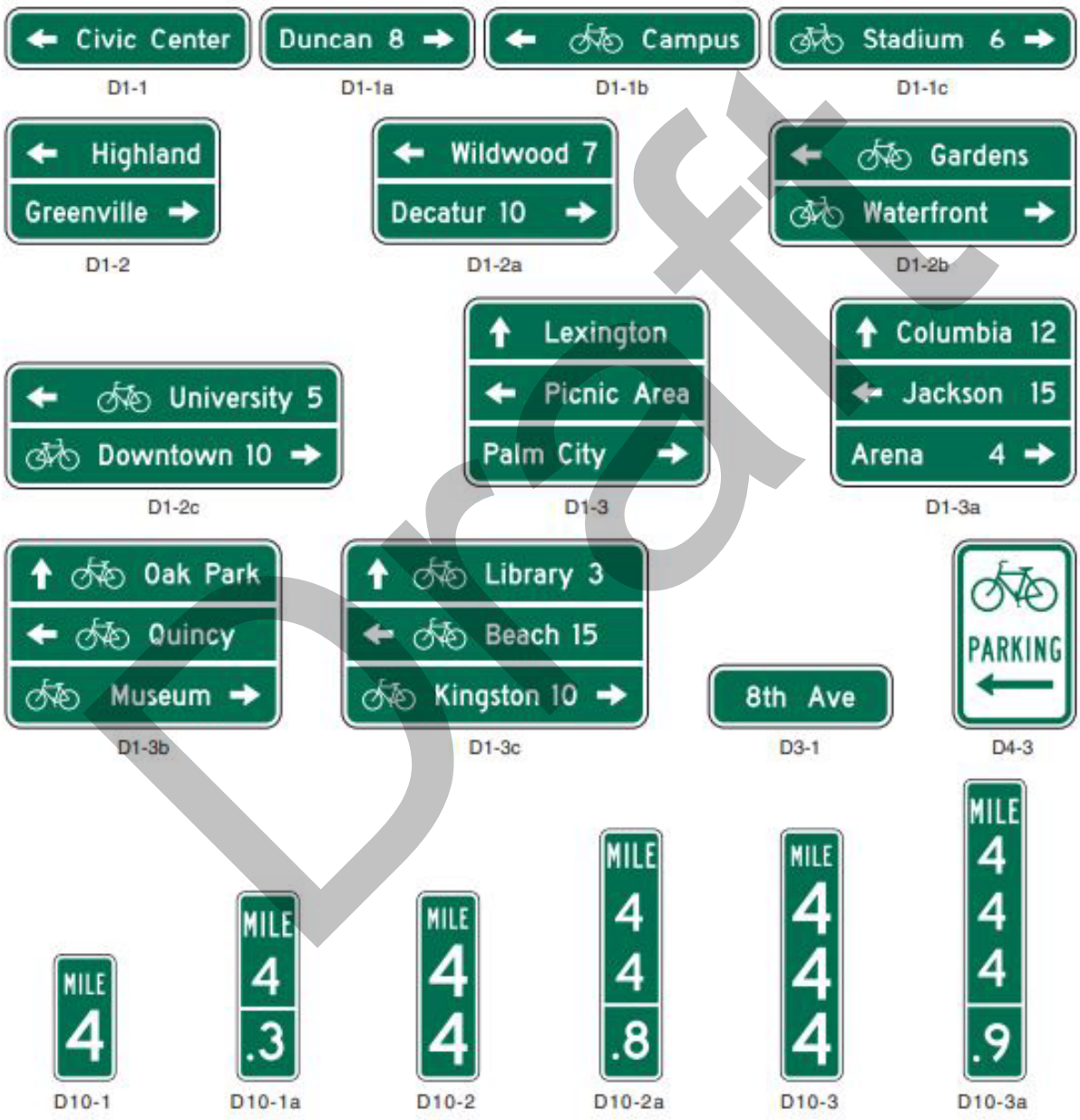
★A fluorescent yellow-green background color may be used for this sign or plaque. The background color of the plaque should match the color of the warning sign that it supplements.

*Source: 2009 MUTCD, Chapter 9B, Signs. The MUTCD Table 9B-1 (pp. 791-792) contain the minimum sign and plaque size requirements for **shared-use paths only**. If the sign or plaque applies to motorists and bicyclists, the minimum size requirements are shown in Tables 2B-1, 2C-2, or 2D-1.

Appendix C - Pedestrian and Bicycle Signage Standards

The Figure 9B-4 below from the MUTCD show different guide signs and plaques for bicycle facilities. Minimum required sizes are also listed in Table 9B-1 in the 2009 MUTCD*.

Figure 9B-4. Guide Signs and Plaques for Bicycle Facilities (Sheet 1 of 2)

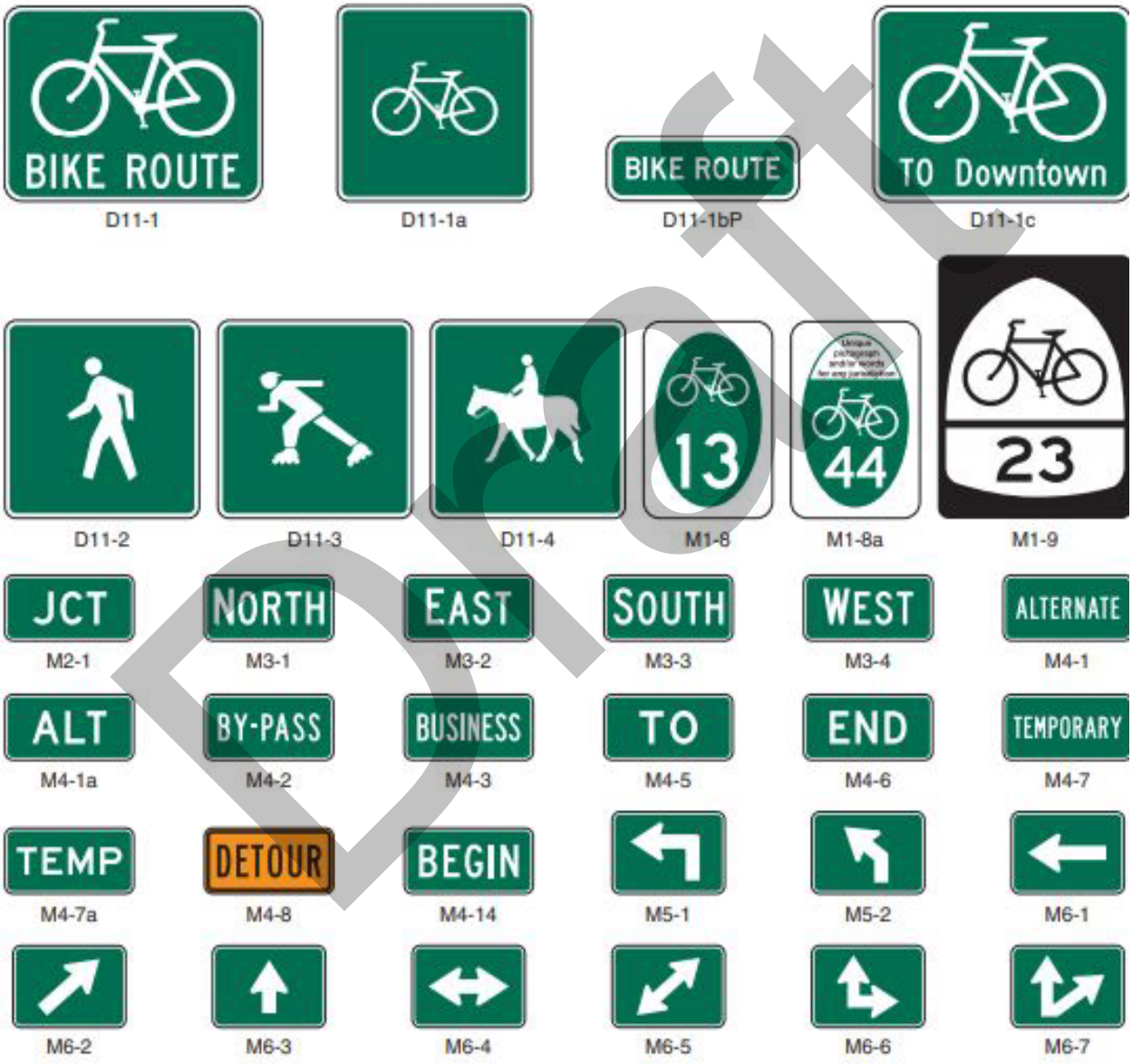


*Source: 2009 MUTCD, Chapter 9B, Signs. The MUTCD Table 9B-1 (pp. 791-792) contain the minimum sign and plaque size requirements for **shared-use paths only**. If the sign or plaque applies to motorists and bicyclists, the minimum size requirements are shown in Tables 2B-1, 2C-2, or 2D-1.

Appendix C - Pedestrian and Bicycle Signage Standards

The Figure 9B-4 below from the MUTCD is a continuation from the previous page, showing different guide signs and plaques for bicycle facilities. Minimum required sizes are also listed in Table 9B-1 in the 2009 MUTCD*.

Figure 9B-4. Guide Signs and Plaques for Bicycle Facilities (Sheet 2 of 2)

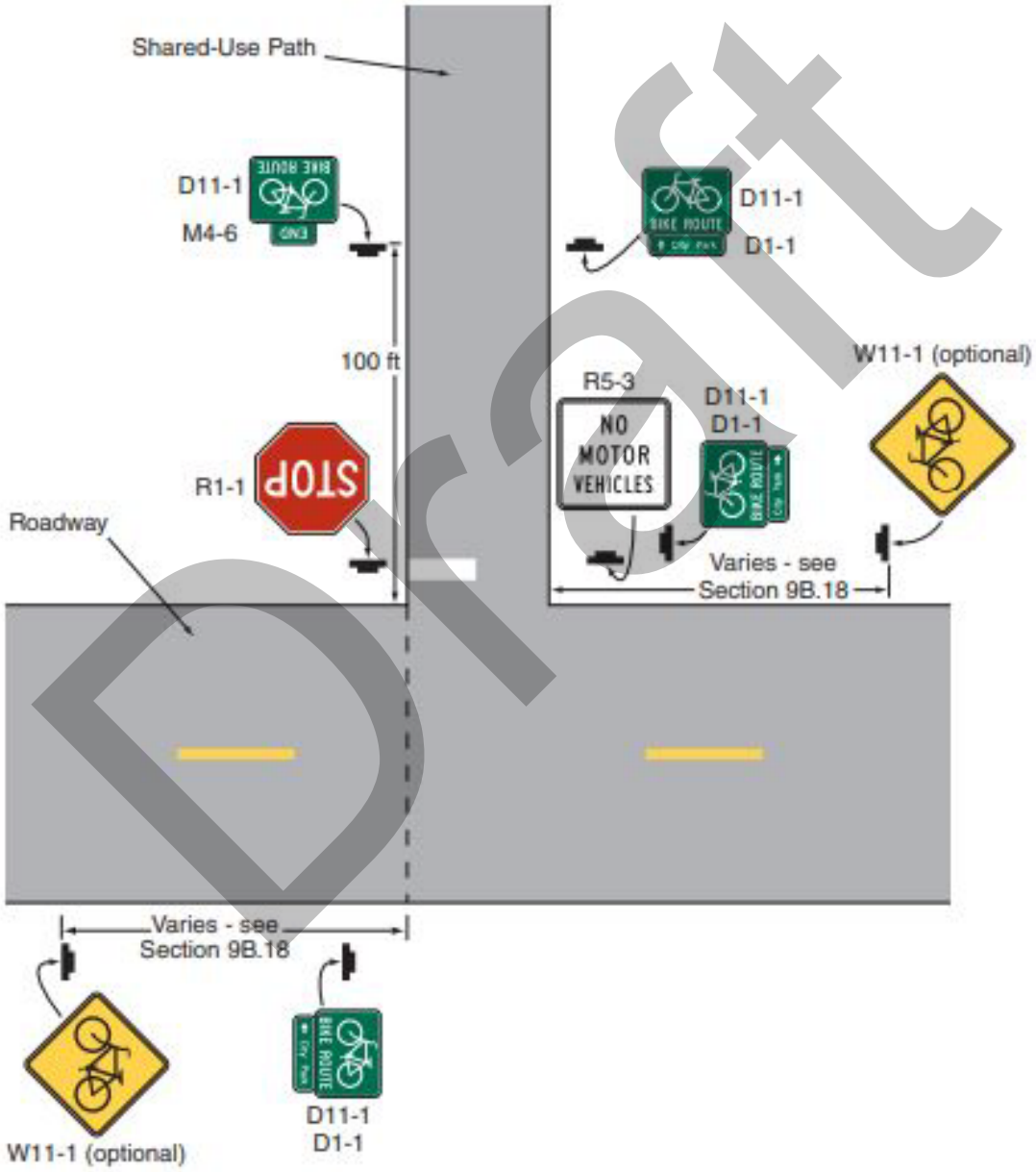


*Source: 2009 MUTCD, Chapter 9B, Signs. The MUTCD Table 9B-1 (pp. 791-792) contain the minimum sign and plaque size requirements for **shared-use paths only**. If the sign or plaque applies to motorists and bicyclists, the minimum size requirements are shown in Tables 2B-1, 2C-2, or 2D-1.

Appendix C - Pedestrian and Bicycle Signage Standards

Figure 9B-5 shows a signage example for the beginning and end of a designated bicycle route on a shared-use path. The MUTCD also shows other signage location scenarios not included here.

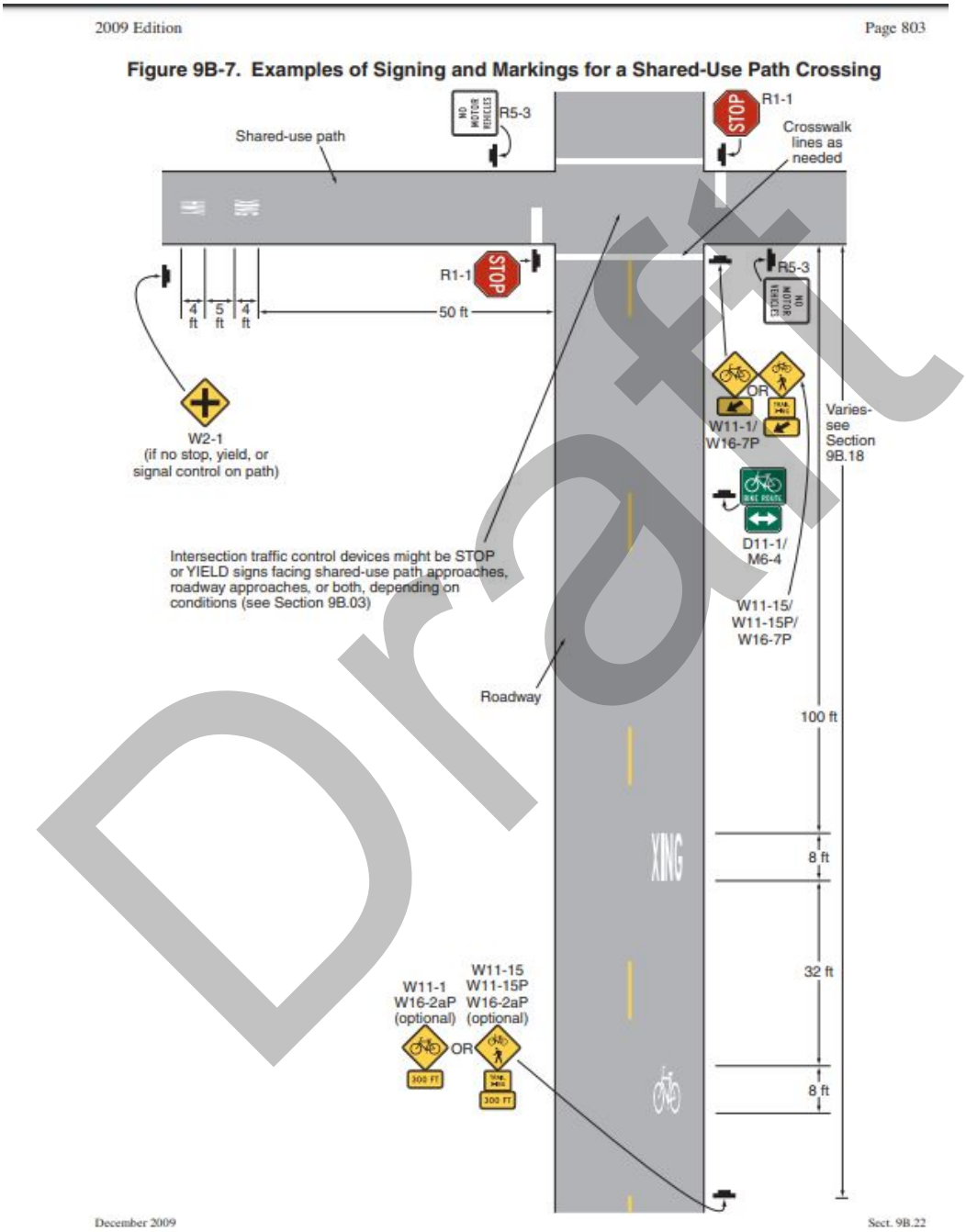
Figure 9B-5. Example of Signing for the Beginning and End of a Designated Bicycle Route on a Shared-Use Path



*Source: 2009 MUTCD, Chapter 9B, Signs. The MUTCD Table 9B-1 (pp. 791-792) contain the minimum sign and plaque size requirements for **shared-use paths only**. If the sign or plaque applies to motorists and bicyclists, the minimum size requirements are shown in Tables 2B-1, 2C-2, or 2D-1.

Appendix C - Pedestrian and Bicycle Signage Standards

Figure 9B-7 shows a signage example for a shared-use path crossing a street.

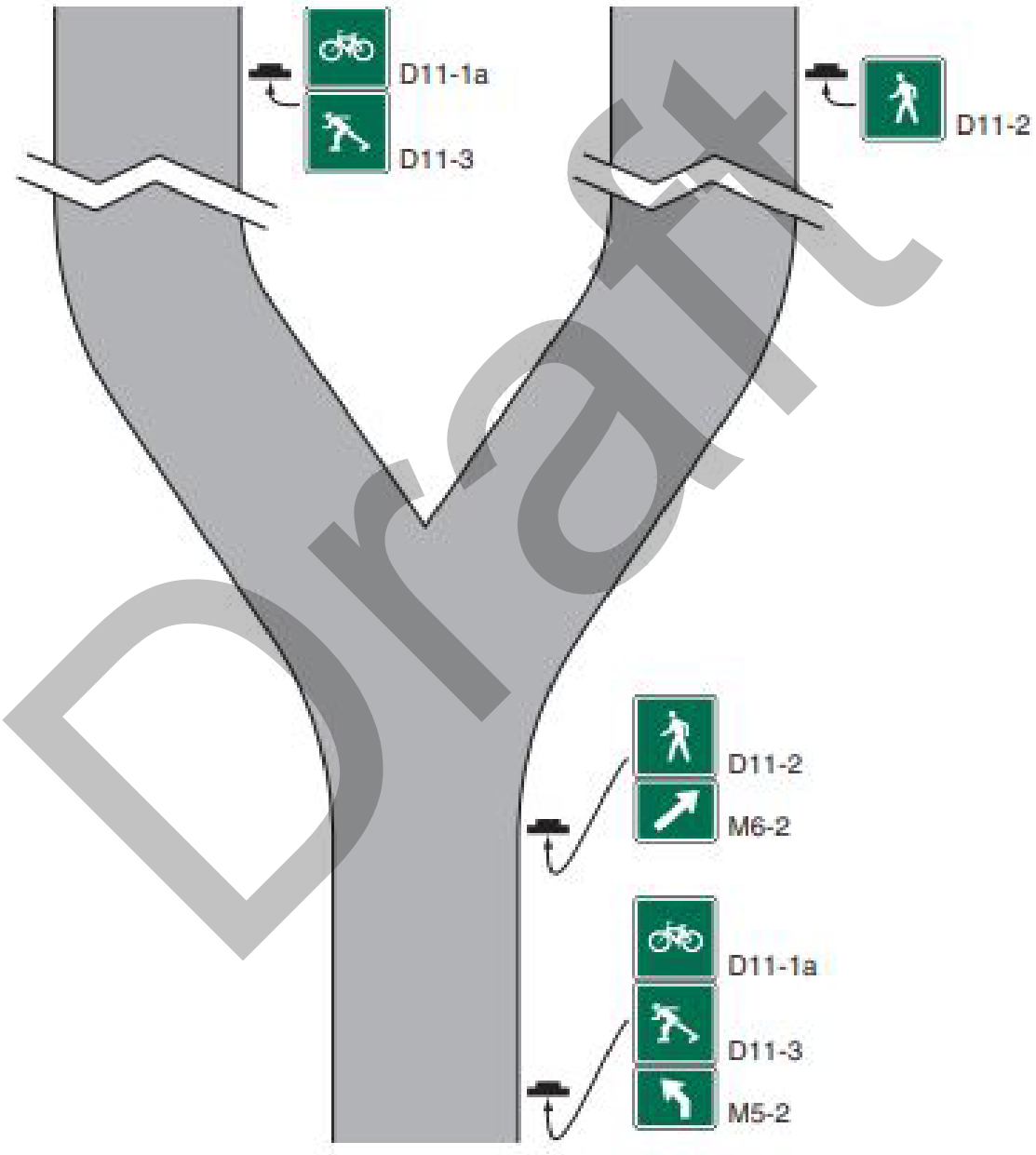


*Source: 2009 MUTCD, Chapter 9B, Signs. The MUTCD Table 9B-1 (pp. 791-792) contain the minimum sign and plaque size requirements for **shared-use paths only**. If the sign or plaque applies to motorists and bicyclists, the minimum size requirements are shown in Tables 2B-1, 2C-2, or 2D-1.

Appendix C - Pedestrian and Bicycle Signage Standards

If the village decides to provide separate pathways for different users, Figure 9B-8 identifies general signage locations to show the split.

Figure 9B-8. Example of Mode-Specific Guide Signing on a Shared-Use Path



*Source: 2009 MUTCD, Chapter 9B, Signs. The MUTCD Table 9B-1 (pp. 791-792) contain the minimum sign and plaque size requirements for **shared-use paths only**. If the sign or plaque applies to motorists and bicyclists, the minimum size requirements are shown in Tables 2B-1, 2C-2, or 2D-1.

Appendix C - Pedestrian and Bicycle Roadway Marking Standards

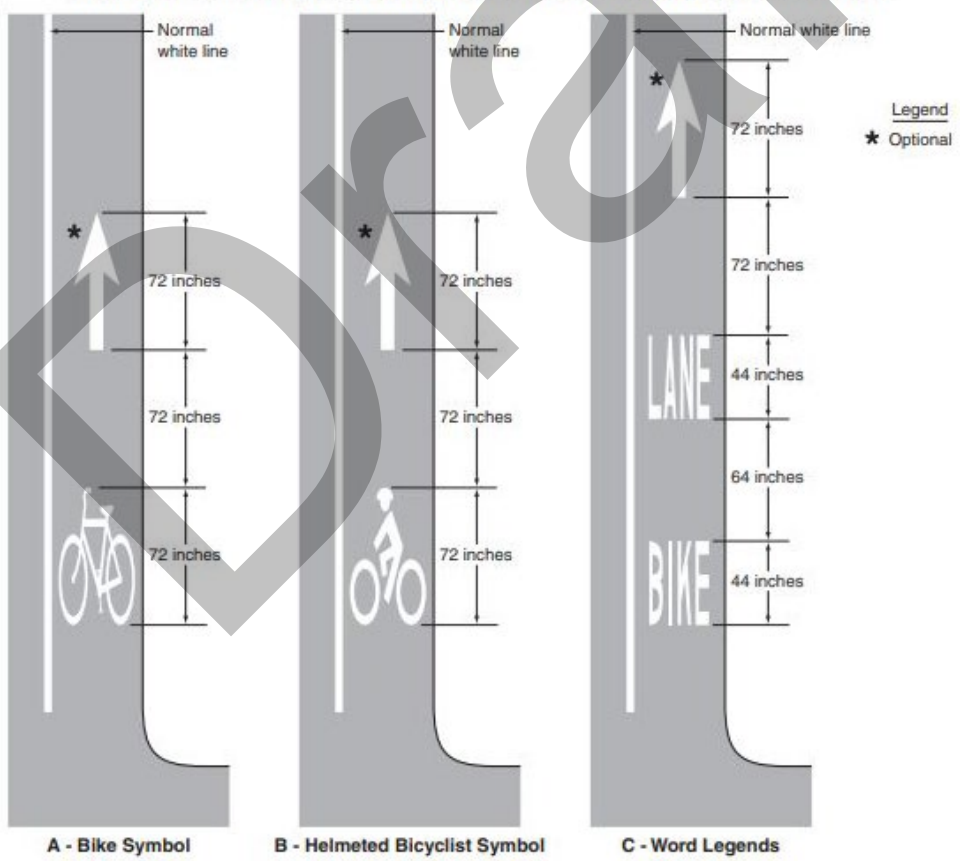
Section 9C of the MUTCD addresses numerous aspects of pavement markings for bicycle facilities. Pavement markings typically consist of:

- Solid or broken-edge line lane markings that delineate the vehicle travel lane and the bike lane.
- Lane symbols that indicate the preferential nature of the bike lane and its direction.
- Traffic signal detector symbol to indicate preferred bicyclist stopping location at actuated signals.
- Pavement markings to warn of road hazards or obstructions.

Care should be taken to use pavement striping that is durable, yet skid-resistant. Reflectors and raised markings in bike lanes can deflect a bicycle wheel, causing a bicyclist to lose control. If reflective pavement markers are needed for motorists, they should be installed on the motorist's side of the stripe and have a beveled front edge.

The diagrams below shows possible different bicycle lane marking treatments.

Figure 9C-3. Word, Symbol, and Arrow Pavement Markings for Bicycle Lanes



*Source: 2009 MUTCD, Chapter 9C, Markings. This chapter details general principles and standards to use for pavement markings.

Appendix C - Pedestrian and Bicycle Roadway Marking Standards

Figure 9C-7 below shows a bicycle detector symbol, which may be placed on the pavement to indicate the optimum position for a bicyclist to actuate a signal.

Figure 9C-9 is for a shared lane marking. The shared lane marking may be used to:

- Assist bicyclists with lateral positioning in a shared lane with on-street parallel parking in order to reduce the chance of the bicyclist hitting an open car door.
- Assist bicyclists with lateral positioning in lanes that are too narrow for a motor vehicle and a bicycle to travel side by side within the same traffic lane.
- Alert road users of the lateral location bicyclists are likely to occupy within the traveled way.
- Encourage safe passing of bicyclists by motorists, and
- Reduce the incidence of wrong-way bicycling.

Shared lane markings may be used in conjunction with Bicycles May Use Full Lane sign (detailed in MUTCD Section 9B.06).

Shared lane markings shall not be used on shoulders or in designated bicycle lanes.

Figure 9C-7. Bicycle Detector Pavement Marking

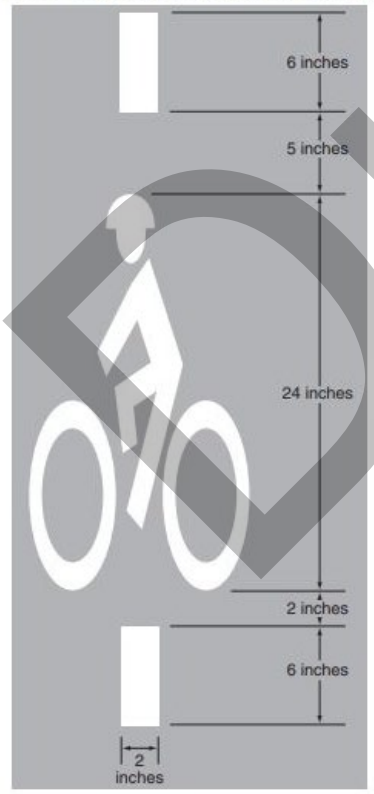
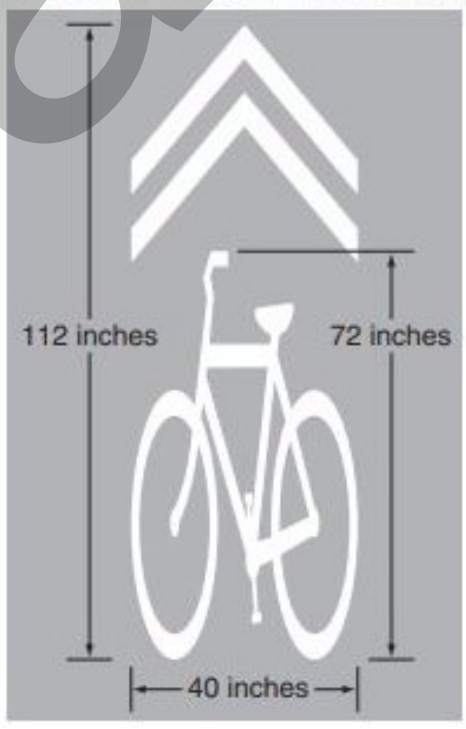


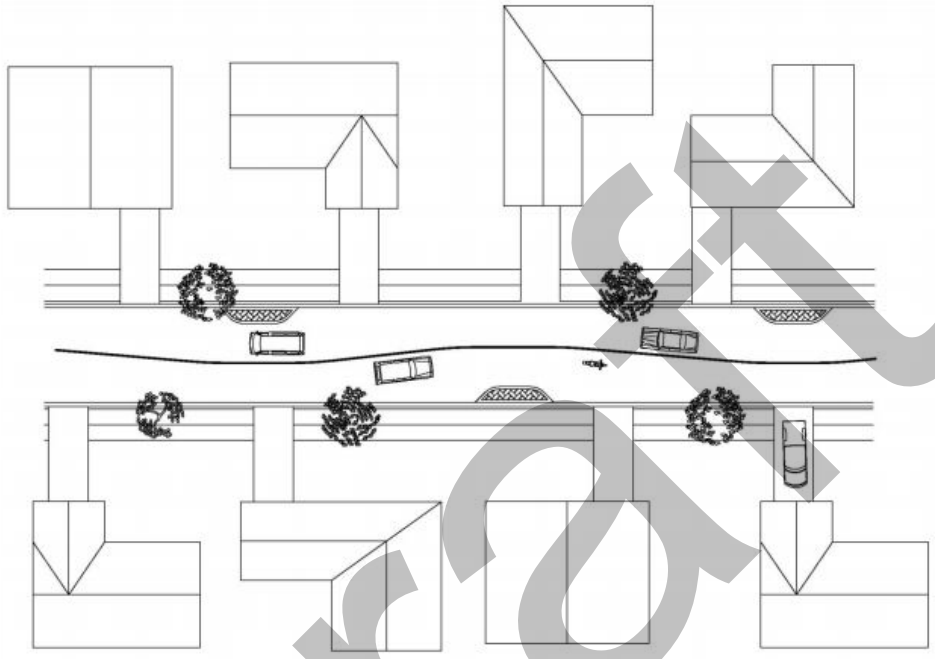
Figure 9C-9. Shared Lane Marking



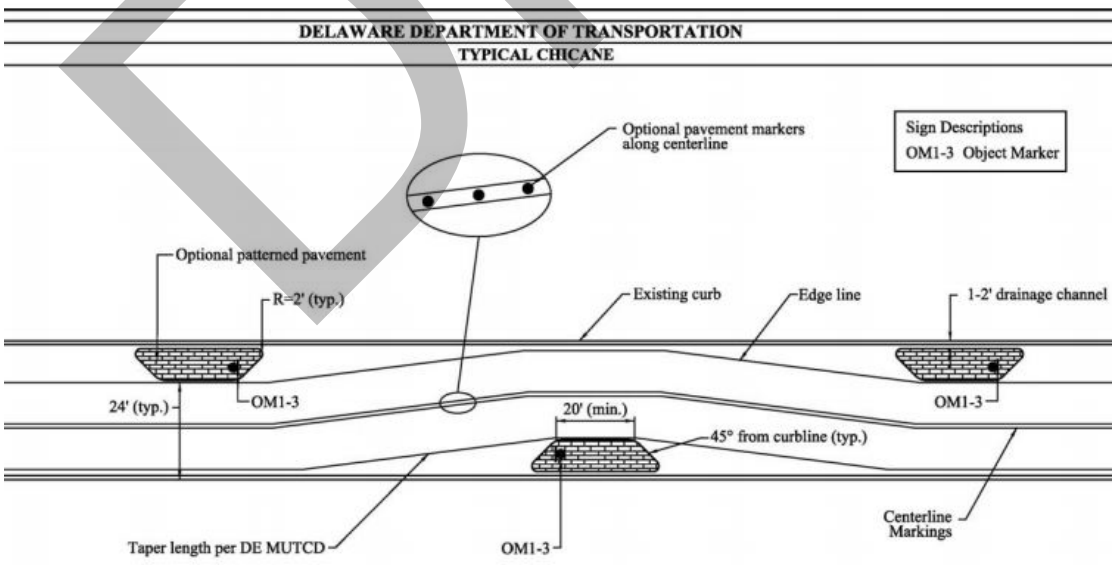
*Source: 2009 MUTCD, Chapter 9C, Markings. This chapter details general principles and standards to use for pavement markings.

Appendix D – Speed Management – Speed Bumps, Humps, and Tables

Speed management measures on low/slow traffic streets help bring motor vehicle speeds closer to those of bicyclists and pedestrians, and help improve the pedestrian and bicycling environment.

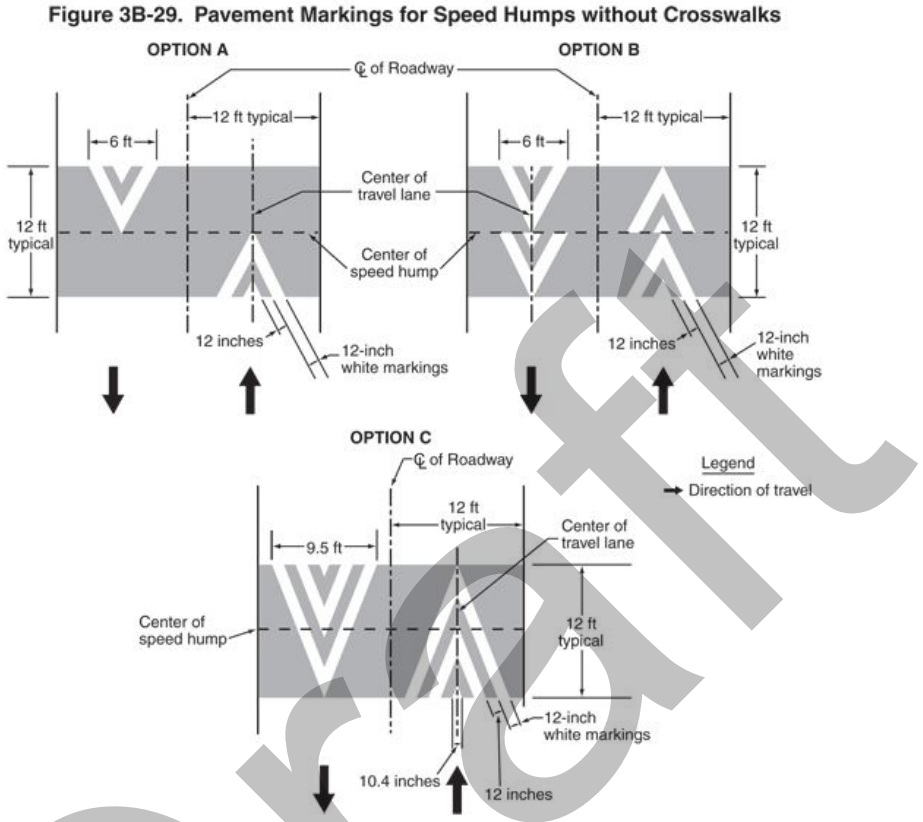


Example of a chicane on a residential street. Source: Delaware Department of Transportation Traffic Calming Design Manual, Chapter III – Appropriate Applications and Geometric Design, November 2012.

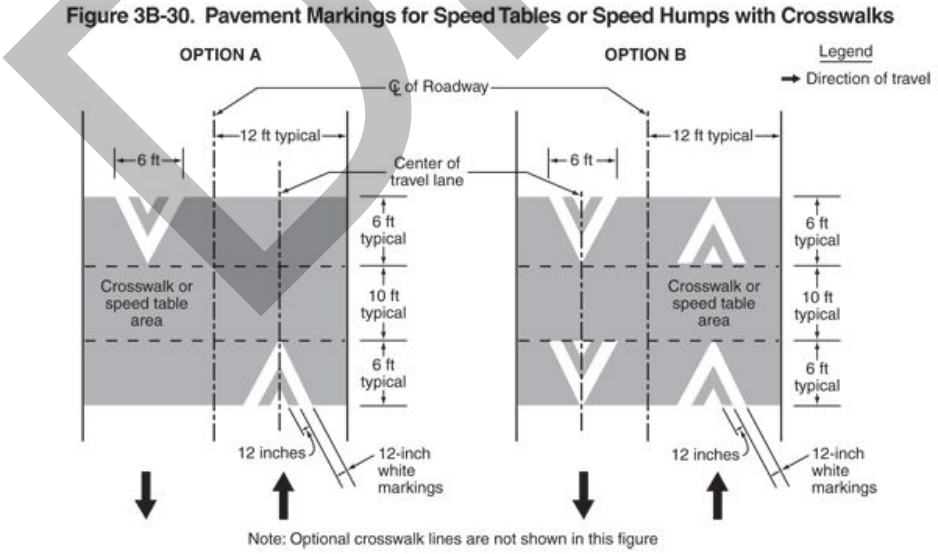


Chicane design diagram. Source: Delaware Department of Transportation Traffic Calming Design Manual, Chapter III – Appropriate Applications and Geometric Design, November 2012.

Appendix D – Speed Management – Speed Bumps, Humps, and Tables



Pavement markings for speed humps. Source: 2009 MUTCD, Chapter 3B. Pavement and Curb Markings.



Pavement markings for speed humps. Source: 2009 MUTCD, Chapter 3B. Pavement and Curb Markings.

Appendix E – Trailheads

Trailhead design concepts are not discussed elsewhere in this plan. However, the village should strongly consider how trailheads are designed and implemented as it builds new multi-use paths, or enhances existing ones. Trailheads are designated public access points to a trail. While they are often at a trail's terminus, they do not have to be. The village will potentially have both types: a trailhead for the Hillcrest Drive multi-use path, and an opportunity to coordinate on creating trailhead areas along the rail trail when that is developed.

The Rails-to-Trails Conservancy provides general design information on trailheads[1], and also references the Pennsylvania Department of Natural Resources' *Trail Design and Development Principles*[2] for trailhead design considerations. Some of the key components to consider for trailhead planning and design are:

- **User types** – Which groups of people will use the trail, and how will they arrive there? The village should also consider accessibility and how to accommodate people with different needs to participate in the trail activities.
- **Access management –** The village or managing entity will want to discourage prohibited uses at all points along the trail, and also enhance the safety of the trail users.
- **Signage –** Signage should orient trail users to where they are, and provide clear information where they need to go. If the trail has any important rules or other pertinent information, that should also be posted at the trailhead with things like kiosks and bulletin boards.
- **Location –** Depending on what a proposed trailhead is near will help determine what amenities the trailhead should provide onsite. The trailhead may share amenities with another attraction, and thus only need minimum modifications.
- **Existing buildings –** If buildings already exist along the trail or at the trailhead, there could be opportunities to incorporate them as amenities, or additional attractions to complement the trail, such as a café or a public venue.

This plan does not include cost estimates for any trailheads because of the unknown factors at this point.

[1]Rails-to-Trails Conservancy. Trailheads. 2019. Website. 9 October 2019. https://www.railstotrails.org/build-trails/trail-building-toolbox/design/trailheads/

[2]Pennsylvania Department of Conservation and Natural Resources. *Pennsylvania Trail Design & Development Principles: Guidelines for Sustainable, Non-motorized Trails.* Website. 9 October 2019. http://www.docs.dcnr.pa.gov/cs/groups/public/documents/document/dcnr_20028130.pdf.

Appendix F - Pedestrian and Bicycle Facility Cost Estimates

The following information is provided as an initial step in estimating probable costs for implementation projects so that decision makers are able to make informed decisions when dedicating funding and investing in infrastructure improvements. These estimates are taken from *Costs for Pedestrian and Bicyclist Infrastructure Improvements: A Resource for Researchers, Engineers, Planners, and the General Public,* prepared for the Federal Highway Administration by the UNC Highway Safety Research Center (2013), and from *Cost Analysis of Bicycle Facilities: Cases from cities in the Portland, OR region,* from Portland State University's Center for Urban Studies (2013). The Robert Wood Johnson Foundation supported both projects through its Active Living Research program. The estimates listed in the table are taken from the median and average costs presented in the *Costs* report, since the average could be skewed by very expensive projects.

Please note that the following figures are rough cost estimates, and that actual costs may vary due to cost and/or availability of materials, labor, existing road conditions, and other external factors. The infrastructure estimates do include general engineering and design costs, which will also vary in practice.

Treatment	Unit	Median Cost	Average Cost
General cost per type of facility			
Multi-Use Trail – Paved	Mile	$261,000	$481,140
Multi-Use Trail – Unpaved	Mile	$83,870	$121,390
Bicycle lane	Mile	$89,470	$133,170
Overpass/underpass – Wooden bridge	Each	$122,610	$124,670
Overpass/underpass – Pre-fab steel bridge	Each	$191,400	$206,290
Signs, signals, and wayfinding			
Pedestrian and bicycle crossing signs	Each		$200/sign
Wayfinding sign	Each		$200-440/sign
Rectangular Rapid Flash Beacon (RRFB)	Each	$14,160	$22,250
Pedestrian hybrid beacon (PHB/HAWK)	Each	$51,460	$57,680
Pavement Markings			
Bike lane symbol (paint)	Each		$250-$270/stencil
Sharrows	Each		$250-$339/sharrow
Crosswalks			
High visibility crosswalk	Each	$3,070	$2,540
Striped crosswalk	Each	$340	$770
Striped crosswalk	Linear foot	$5.87	$8.51
Striped crosswalk	Square foot	$6.32	$7.38
Raised crosswalk w/speed table	Each	$7,110	$8,170
Curb Ramp – Truncated Dome/Detectable Warning	Square foot	$37	$42
Curb Ramp – Wheelchair Ramp	Each	$740	$810

Appendix F - Pedestrian and Bicycle Facility Cost Estimates

Treatment	Unit	Median Cost	Average Cost
Intersection treatments/traffic calming			
Curb extension/ choker/ bulb-out	Each	$10,150	$13,000
Speed hump (more gradual compared to speed bump)	Each	$2,130	$2,640
Speed bump (smaller, more extreme angle)	Each	$1,670	$1,550
Speed table (broad, long speed bump)	Each	$2,090	$2,400
Raised crosswalk	Each	$7,110	$8,170
Raised intersection	Each	$59,160	$50,540
Median	Square foot	$6.00	$7.26
Crossing island	Each	$10,460	$13,520
Chicanes	Each		$5,000/chicane
Traffic Circles	Each		$20,000/circle
Other			
Bicycle parking (rack)	Each	$540	$660
Bicycle parking (locker)	Each	$2,140	$2,090
Street lights	Each	$3,600	$4,800
Bollards	Each	$650	$730
Street trees	Each	$460	$430
Bench	Each	$1,660	$1,550
Trash/recycling receptacle	Each	$1,330	$1,420

Appendix G - Pedestrian and Bicycle Facility Cost Estimates Implementation

The following estimates are calculated through the available cost information and estimated distances or units required for each project. The Village of Hobart will establish the final approximate distances and units required for each project during its design and engineering phase. Where more than one treatment option is listed for a location, either option may be considered to implement. The treatments listed are the minimum recommendations for each location; the village may utilize additional treatments as it sees fit.

*For these estimates, the bicycle lane cost range will be used since that number assumes adding a 5' lane to each side of the roadway.

**For on-street bike routes, this estimate will assume placing wayfinding signage every 1/4 mile (1,320'), and sharrow markings every 500 feet (both directions). These distances are not prescriptive, and actual placement may vary depending on conditions and number of intersections/decision points.

Project Map Point	Location	Treatment	Distance/Unit	Based on Median Cost	Based on Average Cost
1	North Overland – Howard Connector	Multi-use path (paved)	0.46 miles	$120,060	$221,324
2	North Overland – Centennial Centre Connector	5' paved shoulder	1.15 miles	$102,891	$153,146
2	North Overland – Four Seasons to Birch Drive Connector	Multi-use path (paved)	0.1 mile	$26,100	$48,114
2	North Overland Crosswalks – Four Seasons Drive and Birch Drive	High visibility crosswalk	2.0	$6,140	$5,080
3	Centennial Centre Blvd Connector	5' paved shoulder	0.43 miles	$38,472	$48,663
4	Birch Drive - Melanie Drive Connector	On-street bike route	1.22 miles a. 5 signs b. 26 sharrows	a. $1,000-$2,200 b. $6,500-$8,814	
5	North Pine Tree	Multi-use path (paved)	0.89 miles	$232,290	$428,214
6	Thornberry Creek	On-street bike route	1.29 miles a. 5 signs b. 28 sharrows	a. $1,000-$2,200 b. $7,000-$9,492	
7	Hillcrest School Trail Connector – paved option	Multi-use path (paved)	0.62 miles	$161,820	$298,307
7	Hillcrest School Trail Connector – unpaved option	Multi-use path (unpaved)	0.62 miles	$51,999	$75,262

Appendix G - Pedestrian and Bicycle Facility Cost Estimates Implementation

*For these estimates, the bicycle lane cost range will be used since that number assumes adding a 5' lane to each side of the roadway.

**For on-street bike routes, this estimate will assume placing wayfinding signage every 1/4 mile (1,320'), and sharrow markings every 500 feet (both directions). These distances are not prescriptive, and actual placement may vary depending on conditions and number of intersections/decision points.

Project Map Point	Location	Treatment	Distance/Unit	Based on Median Cost	Based on Average Cost
8	Concord Way – Indian Trail	On-street bike route	0.98 miles a. 4 signs b. 20 sharrows	a. $800-$1,760 b. $5,000-$6,780	-
8	Navajo Trail	On-street bike route	0.92 miles a. 4 signs b. 20 sharrows	a. $800-$1,760 b. $5,000-$6,780	-
8	Seminole Trail	On-street bike route	0.91 miles a. 4 signs b. 20 sharrows	a. $800-$1,760 b. $5,000-$6,780	-
9	Park Drive	On-street bike route	0.48 miles a. 2 signs b. 10 sharrows	a. $400-$880 b. $2,500-$3,390	-
10	Trout Creek Road	Multi-use path (paved)	1.03 miles	$268,830	$495,574
13	Haven Place Connector	On-street bike route	0.37 miles a. 2 signs b. 8 sharrows	a. $400-$880 b. $2,000-$2,712	-
14	North Overland – Birch to W Mason	5' paved shoulder	2.86 miles	$255,884	$380,866
15	Hillcrest Drive North	Multi-use path (paved)	0.97 miles	$253,170	$466,706
16	Hillcrest Crosswalk – Opt. A	PHB/HAWK Signal	1.0	$51,460	$57,680
16	Hillcrest Crosswalk – Opt. B	RRFB	1.0	$14,160	$22,250
16	Hillcrest Crosswalk treatment	High visibility crosswalk	1.0	$3,070	$2,540
16	Hillcrest Elementary	Speed Table	1.0	$2,090	$2,400
17	South Overland Road	5' paved shoulder	6.28 miles	$561,872	$836,308

Appendix G - Pedestrian and Bicycle Facility Cost Estimates Implementation

*For these estimates, the bicycle lane cost range will be used since that number assumes adding a 5' lane to each side of the roadway.

**For on-street bike routes, this estimate will assume placing wayfinding signage every 1/4 mile (1,320'), and sharrow markings every 500 feet (both directions). These distances are not prescriptive, and actual placement may vary depending on conditions and number of intersections/decision points.

Project Map Point	Location	Treatment	Distance/Unit	Based on Median Cost	Based on Average Cost
18	Fernando Drive – Village portion	Multi-use path (paved)	2.0 miles	$522,000	$962,280
18	Fernando Drive – County portion	Multi-use path (paved)	1.4 miles	$365,400	$673,596
19	Orlando Drive – Village portion	5' paved shoulder	2.0 miles	$167,740	$266,340
19	Orlando Drive – County portion	5' paved shoulder	0.84 miles	$75,155	$111,863
19	Grant Street – County portion	5' paved shoulder	1.78 miles	$159,257	$237,043
20	Nathan Drive	On-street bike route	1.98 miles a. 8 signs b. 42 sharrows	a. $1,600-$3520 b. $10,500-$14,238	-
23	South Pine Tree Road – County portion	5' paved shoulder	3.91 miles	$349,827	$520,694
24	Florist Drive	On-street bike route	1.79 miles a. 7 signs b. 19 sharrows	a. $1,400-$3,080 b. $4,750-$6,441	-
25	Cyrus Drive	Multi-use path (paved)	1.24 miles	$323,640	$596,613

Appendix H – Potential Environmental Permitting Requirements

Depending on the location of pedestrian and bicycle infrastructure projects, the village may need to obtain permits from the Wisconsin Department of Natural Resources.

The DNR would need to review work if any material is placed in wetlands or waterways. Depending on the site specifics, the village may need to obtain either a wetland disturbance – municipal development general permit, or an individual permit.

- If the project does not meet the general permit standards, or general permit conditions are sufficient to ensure the wetland discharge will cause only minimal adverse environmental impacts, then the individual permit would apply.
- For individual permits, the DNR requires a pre-application meeting with DNR staff prior to submitting the completed application[1].

[1]Wisconsin Department of Natural Resources. Regulating wetland impacts. 2019. Website. 9 October 2019. https://dnr.wi.gov/topic/wetlands/permits/

Appendix I - Sidepath Suitability Algorithm Examples

This appendix is to supplement the Sidepath Suitability section introduced in Chapter 2 on page 36, to present the equation in more detail. The following algorithm rates the suitability of a sidewalk or sidepath as a bicycle facility. A sidepath is a trail parallel to, but separated from, a roadway. In addition to rating existing sidepaths, it can be used to plan safety improvements for new or existing sidepaths. At present, no such nationally accepted suitability index exists. This algorithm was developed using design issues described in the AASHTO Guide for the Development of Bicycle Facilities.

The factors considered are: intersection traffic, continuity, curb cuts, pedestrian use, crosswalks, and path/road separation at intersections. For a particular segment, add the following terms:

1. **Intersection Traffic Score**. The volume and speed of motor vehicular traffic – especially turning traffic – directly affect the risk of collision. Determine the intersection traffic score X from the following: X = [R+(2*A)+(4*B)] / M * [Spd*Vol];

Where:
R = Number of residential driveway intersections
A = Number of minor street/minor commercial driveway intersections (< 1,000 ADT)
B = Number of major street/major commercial driveway intersections (≥ 1,000 ADT)
M = Street segment length (in miles)
Spd = Posted speed limit on parallel street (≤ 30 mph = 1, 35-40 = 2, ≥ 45 = 3)
Vol = Traffic volume factor, parallel street; ≤ 2,000 ADT = 1, 2,000-10,000 ADT = 2, ≥ 10,000 ADT = 3):

Add the following number of points for the intersection traffic score X.

X	**Points**
0	0
1-40	1
41-80	2
81-120	3
121-160	4
161-200	5
201-240	6
> 240	7

2. **Continuity**. Discontinuities (major gaps, or sidepath ends) may force cyclists to ride through grass, etc., and enter the roadway awkwardly. Cyclists will often avoid sidepaths with these gaps. Add 4 points if major discontinuities exist.

3. **Curb cuts**. Uncut curbs compromise cyclist movement and attention at intersections. Add 3 points if any intersections are lacking curb cuts.

Appendix I - Sidepath Suitability Algorithm Examples

4. **Pedestrian use**. Sidewalks and sidepaths are used by both bicyclists and pedestrians. Insufficient width increases user conflict. (However, extra width encourages higher cyclist speeds – which becomes a problem at incorrectly-designed intersections.) Add points according to the following chart:

Low (rare) pedestrian use	Medium (sometimes) pedestrian use	High (often) pedestrian use
<= 5′ – 1 point	<= 5′ – 2 points	<= 5′ – 4 points
> 5′ – 0 points	6-7′ – 1 point	6-7′ – 2 point
N/A	>= 8′ – 0 points	>= 8′ – 1 point

5. **Crosswalks**. Visible crosswalks can help make motorists more aware of non-motorized traffic. Sometimes two parallel painted stripes are sufficient. At busier intersections, "ladder" or "zebra" crosswalks and other techniques enhance visibility. Add 2 points if there are no crosswalks. Add 1 point if there are some crosswalk markings, but more visibility is warranted for that intersection type. Add 0 points for appropriately marked crossings. Take the worst-case crossing for the segment.

6. **Intersection sidepath/road separation**. AASHTO recommends that sidepaths be brought closer to the parallel road at intersections, so motorists more easily see and consider bicyclists during their approaches. The vehicular stop line should be in back of the sidepath crossing – cyclists must not weave through stopped traffic when crossing. Add 5 points if the crossing goes through stopped traffic. Add 3 points if the crossing is not brought "close enough" to the parallel road. Add 1 point when the crossing is brought close to the road. (Paved shoulders and bike lane crossings – 0 points.) Again, take the worst-case crossing for the segment.

Add together all the points for the sidepath suitability score. Ranges of suitability are:

Suitability Score	Suitability
<= 7	High suitability
8-9	Medium suitability
10-11	Low suitability
>= 12	Not suitable (poor)

Sidepath Suitability Algorithm Source: North Aurora (IL) Plan
http://rideillinois.org/wp-content/uploads/2015/10/NorthAuroraPlan.pdf

Appendix I - Sidepath Suitability Algorithm Examples

Hobart Example 1 – Hillcrest Drive
The first example will calculate the sidepath suitability of a path along Hillcrest Drive, from the point south of Centennial Centre Boulevard where the existing path ends, to the intersection of Hillcrest Drive and Riverdale Drive.

1. **Intersection Traffic Score**

   R= 6 residential driveways
   A= 6
   B= 0
   M= 0.97 miles
   Spd = 45 (≥ 45 = 3 points)
   Vol = 2,000-10,000 ADT (based on most recent WisDOT ADT (2018) of 4,600) (2 points)
   [R+(2*A)+(4*B))]/ M * [Spd*Vol] = [6+(2*6)+(4*0))] / 0.97 * [3 * 2] = 111.34 **(3 points)**

2. **Continuity –** N/A, no current path to have discontinuities, **+0 points.**
3. **Curb Cuts –** No curb cuts at Pleasant Valley Drive, **+3 points**.
4. **Pedestrian use –** Assuming at least 8' wide path; assuming high pedestrian use = **+1 point**.

Low (rare) pedestrian use	Medium (sometimes) pedestrian use	High (often) pedestrian use
<= 5' – 1 point	<= 5' – 2 points	<= 5' – 4 points
> 5' – 0 points	6-7' – 1 point	6-7' – 2 point
N/A	>= 8' – 0 points	>= 8' – 1 point

5. **Crosswalks** – Currently no crosswalks along this segment; **+2 points**.
6. **Intersection sidepath/road separation –** Since path doesn't exist yet, this should be accommodated for during the design phase; assuming this can be achieved, **+0 points**.

7. **Total Suitability Score = 9 = Medium suitability**

A sidepath along Hillcrest Drive would have high suitability, assuming that the crosswalks would be added at the appropriate places. Even if only some, crosswalks were added, the path would have improved suitability.

Suitability Score	Suitability
<= 7	High suitability
8-9	Medium suitability
10-11	Low suitability
>= 12	Not suitable (poor)

Appendix I - Sidepath Suitability Algorithm Examples

Hobart Example 2 – North Pine Tree Road
This example will calculate the sidepath suitability of a path along North Pine Tree Road, where it currently ends at Sunbeam Circle to Trout Creek Road.

1. **Intersection Traffic Score**

   R= 11 residential driveways
   A= 4
   B= 0
   M= 0.89 miles
   Spd = 25 (≥ 30 = 1 point)
   Vol = <2,000 ADT (based on most recent WisDOT ADT (2018)) (1 point)
   [R+(2*A)+(4*B))]/ M * [Spd*Vol] = [11+(2*4)+(4*0))] / 0.89 * [1 * 1] = 21.3 **(1 point)**

2. **Continuity –** N/A, no current path to have discontinuities, **+0 points.**
3. **Curb Cuts –** No curbs at any intersections or driveways, **+0 points**.
4. **Pedestrian use –** Assuming a least a 6' wide path with medium pedestrian use = **+1 point**.

Low (rare) pedestrian use	Medium (sometimes) pedestrian use	High (often) pedestrian use
<= 5' – 1 point	<= 5' – 2 points	<= 5' – 4 points
> 5' – 0 points	6-7' – 1 point	6-7' – 2 point
N/A	>= 8' – 0 points	>= 8' – 1 point

5. **Crosswalks** – Currently no crosswalks along this segment; **+2 points**.
6. **Intersection sidepath/road separation –** Since path doesn't exist yet, this should be accommodated for during the design phase; assuming this can be achieved, **+0 points**.

7. **Total Suitability Score = 4 = High suitability**

A sidepath along North Pine Tree would have a high sidepath suitability. Adding any crosswalks along the route would increase the suitability.

Suitability Score	Suitability
<= 7	High suitability
8-9	Medium suitability
10-11	Low suitability
>= 12	Not suitable (poor)