Wood County Bicycle and Pedestrian Plan

Wood County, Wisconsin

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INTRODUCTION

What is the purpose of this plan?

This plan is intended to guide the development of bicycle and pedestrian facilities and policies in Wood County within the framework of the County's overall transportation system. The vision of this plan is to increase the mobility of people within the county by making bicycling and walking viable and attractive transportation choices.

At the regional level a goal of this plan is to strengthen the rural character of the county by connecting natural and cultural resource destinations and by connecting communities. Within urban and suburban areas the plan will recommend bicycle and pedestrian corridors that will connect people to destinations such as employment centers, schools, residential districts, recreation areas and commercial retail areas (downtowns, and neighborhood shopping areas). This plan will also recommend education, enforcement and maintenance activities to improve local bicycling and walking activities within the county.

Why is this plan important?

Prior to the 1900's bicycling and walking were common modes of transportation in the United States. Transportation infrastructures and land use patterns reflected the need to accommodate these travel modes. Many early American urban roads were originally paved to help bicyclists get around and compact communities allowed people to walk to most destinations. As the pace of American lifestyle quickened and automobiles were made affordable to a large portion of the population bicycling and walking gradually fell from favor as a means of transportation. Motor vehicles predominantly influenced the evolution of transportation and created land use patterns and facilities that neglected accommodations for other travel modes. More recently, multi-modal systems that afford greater transportation choices are viewed as beneficial, and bicycling and walking are acknowledged as important considerations in the total transportation system.

Our national, state and local units of government are increasingly recognizing the benefits of bicycling and walking beyond their recreational values as viable healthy, cost efficient and environmentally compatible means of travel. Several individual and social benefits include:

- **Transportation benefits:** Bicycling and walking are among the most cost efficient modes of transportation in regards to operation, development of facilities and maintenance. Furthermore, bicycle facilities can offer general transportation benefits such as paved shoulders and less automobile use.

'The Congress recognizes that bicycles are the most efficient means of transportation, represent a viable commuting alternative to many people, offer mobility at speeds as fast as that of cars in urban areas, provide health benefits through daily exercise, reduce noise and air pollution are relatively inexpensive and deserve consideration in a comprehensive national energy plan.' (From Bicycle Transportation for Energy Conservation, 1980; Report to the President)

- **Health and fitness benefits:** Both bicycling and walking are among the best forms of exercise and therefore can effectively enhance the health of individuals and the community.
- **Recreation benefits:** Off road paths developed for bicycling and walking simultaneously stimulates transportation and recreation opportunities.
- **Environmental benefits:** Bicycling and walking do not contribute to noise or air pollution, and furthermore, the development of off-road facilities can protect and enhance natural resources.
- **Social benefits:** Walking and bicycling promote the social interaction of families and the community.

To fully realize the potential of these travel modes it is necessary to both improve infrastructure accommodations and the policies that promote and educate. While nearly eight million Americans enjoy bicycling and all of us are pedestrians, only 7.2% of all trips in the United States are by walking and 0.7% by bicycling. Safety and traffic conditions are reasons often cited for infrequent use of these travel modes. A 1990 Harris Poll suggests that twice as many people would walk or bicycle as a primary means of transportation if better facilities were available. Furthermore, the fact that nearly 40% of trips made in the U.S. are less than five miles points to the potential to increase bicycling and walking.

The National Bicycling and Walking Study, Transportation Choices for a Changing America, 1994, summarizes several national studies that support the potential to increase bicycle and pedestrian transportation and the subsequent benefits. This document describes a vision:

> *.... to create a changed transportation system that offers not only choices among travel modes for specific trips, but more importantly presents these options so that they are real choices that meet the needs of individuals and society as a whole. pp xvii*

As part of the federal initiative to encourage multi-modal transportation, in general, and bicycle and pedestrian transportation in part, the Federal Intermodal Surface Transportation Efficiency Act (ISTEA) provides funding and planning guidelines for states and municipalities. The program requires states and metropolitan planning organizations to address human-powered transportation needs within local transportation plans. The Wisconsin Department of Transportation has responded by channeling ISTEA funds for bicycle and pedestrian facility development and planning.

Wisconsin's support for enhancing bicycle and pedestrian transportation is declared within WisDOT's TransLinks 21 Plan.[1] This transportation initiative is a comprehensive, twenty-five year transportation plan and influenced through two years of planning and public involvement. The TransLinks plan creates statewide provisions for bicycle and pedestrian facilities on state

highway projects included in Metropolitan Planning Organization's (MPO's) bicycle and pedestrian plans, and calls for the development of a comprehensive State Bicycle Plan.

Wood County has recognized bicycling and walking as viable transportation alternatives that deserve consideration within the context of the overall transportation system and has facilitated this plan to seize local opportunities to improve these travel modes.

While current levels of bicycling and walking reflect national averages, the county recognizes opportunities to improve multi-modal facilities and operations. Over, 9,600 people live less than ten minutes travel time to work - well within the distance most people are willing to walk or bicycle. Furthermore, the Wisconsin River corridor, diverse regional landscapes and a multitude of recreational, natural and cultural and resources offer attractive settings for bicycle and pedestrian modes of transportation.

Generally sidewalks and other provisions for pedestrians have been well integrated into all but the most recent suburban developments of the county and while bicycle accommodations are provided at the county level few bicycle facilities are found in urban areas. The general lack of safe urban bicycle facilities and dispersed land use patterns may be limiting bicycling, and to some degree walking, in the county. Wood County's 1991 Parks, Recreation and Open Space Plan recommends:

> *Because of the importance of bicycling as a family activity and mode of transportation, efforts should begin to carry out the County Bicycle Plan to provide better, safer bicycle routes throughout Wood County. pp. 3*

How was the Plan Developed?

In 1974, the Wood County Lanes and Trails committee examined proposals for bikeways through the county that led to the development of the Bicycle Facilities Plan for Wood County in 1980.[2]

Renewed interest in improving local conditions for bicyclists and pedestrians was formalized in 1993 when county officials and advocates of multi-modal transportation joined the Wood County Transportation and Economic Development Committee to initiate and sponsor this planning process. The Committee, whose members represent the county, various townships, business people and the cities of Marshfield and Wisconsin Rapids, has been instrumental throughout the planning process in heightening local public awareness.

This plan was sponsored by Wood County and partly funded by the Wisconsin Bicycle and Pedestrian Facility Program (A Statewide Multimodal

Improvement Program). The plan was prepared by Schreiber/Anderson Associates in conjunction with the Wood County Transportation and Economic Development Committee. The process and criteria used to recommend the county and city bicycle and pedestrian transportation system were largely derived from the Wisconsin Bicycle and Pedestrian Planning Guidance, 1993, the AASHTO Guidelines for Developing Bicycle Facilities, 1990, the Walk Alert: The National Pedestrian Safety Program, 1993, and evaluation methods used from the *Wisconsin Bicycle Map*.

Members of the Wood County Transportation and Economic Development Committee that helped direct this planning effort include:
David Draves - Chairperson
Karl Zimmerman
Leonard Guth
Fran Bailey-Gokey
Gordon E. Stargardt

Thanks also go to the following people that have been instrumental in this planning process:
Gary Popelka - Wood County Planning and Zoning Director
Bob Wagner - Transportation District Four Planner, WisDOT
Tom Huber - State Bicycle Coordinator
David Krekowski - Highway Commissioner
David Goetz - County Auditor
Larry Francis - Wood County Operations Administrator
Randy Allen - City of Marshfield Administrator
Dave Patek - Marshfield Public Works
Richard Kaczmarowski - Marshfield Engineer and Bicyclist
Major Vernon Verjinsky - Wisconsin Rapids
Dave Laspa - Wisconsin Rapids Engineer
Rolland Aubey - Port Edwards Village President
Skip Perkins - Owner, Perkin's Sports, Marshfield
Bob and Pegge Bellamy - The Peddler Bicycle Shop, Wisconsin Rapids

Public involvement was also an important component in the development of this plan. Public involvement was facilitated through newspaper articles, public start up meetings in Marshfield and Wisconsin Rapids, and city/county staff review meetings.

This report builds upon the recommendations of the Bicycle Facilities Plan, Wood County Wisconsin, 1980 and incorporates the findings and recommendations of several other recent local planning studies that relate to bicycle and pedestrian activities in Wood County, including:

- Bicycle Facilities Plan, Wood County Wisconsin, 1980. Parks Department, Planning Office and Highway Department.

• Land Use Analysis, Wood County Wisconsin, Second Edition, 1979. Office of County Planning.

• Park, Recreation and Open Space Plan, Wood County, Wisconsin 1991 Update. Wood County Park Planning and Zoning Office

References

1. Wisconsin TransLinks 21 Newsletter, Final Plan Additions, Vol.2 No. 8, November 1994.

2. From the Bicycle Facilities Plan, Wood County, Wisconsin, 1980

PLANNING PROCESS

This bicycle and pedestrian plan completes an important step in Wood County's transportation system by evaluating existing conditions and future demands and proposing improved bicycling and walking opportunities. **The purpose of this plan is to guide the development of bicycle and pedestrian facilities and policies to create viable and attractive transportation choices for Wood County and it communities.**

Planning Process
- ***Develop goals and objectives unique to Wood County.***
- ***Inventory existing conditions and evaluate use patterns.***
- ***Identify potential bicycle travel corridors***
- ***Evaluate selected corridors through established planning criteria.***
- ***Recommend and prioritize facilities for implementation.***
- ***Prepare operational recommendations.***

This plan proposes the development of facilities, education and enforcement programs, and maintenance procedures to improve bicycling and walking in Wood County. Planning recommendations are intended to be integrated into the overall transportation and land use planning activities by the year 2020.

Project goals and objectives are developed to direct a planning process unique to Wood County. The goals and objectives have been adopted by the Transportation and Economic Development Committee and used to evaluate and recommend planning options. Inventories of conditions include historical data, field observations (conducted by bicycling and walking most of the corridors), secondary literature and meetings with government agency staff. Primary and secondary planning criteria derived from *Wisconsin Bicycle and Pedestrian Planning Guidelines*, *AASHTO Guidelines for Developing Bicycle Facilities*, and *The National Pedestrian Safety Program* were used as general analysis criteria. Following the analysis of planning considerations, county and city staff, the Plan Advisory Committee and the public reviewed preliminary mapped corridors. Long range and priority plans were developed along with cost estimates of recommended facility improvements and finally this report was drafted with recommendations for operating and enhancing bicycling and walking activities.

Planning Goals and Objectives

The purpose of developing project goals and objectives was to: 1. guide the planning process and 2. guide the future operation and enhancement of bicycle and pedestrian activities.

- Enhance natural and cultural resources along environmental corridors such as the Wisconsin River.

  a. Recommend alignments for a system along the Wisconsin River from Biron through Wisconsin Rapids, Port Edwards, and Nekoosa.

  b. Identify and recommend specific corridors that could be protected with bicycle and pedestrian transportation land uses.

- Develop a cost efficient bicycle and pedestrian system that supports the local economy by increasing transportation choices and providing recreation

opportunities.

a. Promote the economic impacts of bicycle and pedestrian transportation by effectively linking employment centers, recreational areas, business districts, neighborhoods, educational centers and cultural destinations.

b. Integrate bicycle and pedestrian transportation modes into Wood County's overall transportation system and make recommendations for highways currently being planned for reconstruction including STH 54 in Wisconsin Rapids and the Marshfield bypass (STH 13).

c. Recognize financial constraints and obligations of bicycle and pedestrian systems, develop an implementation plan and identify funding sources for bicycle and pedestrian transportation options.

d. Propose linkages between county communities.

e. Recommend bicycling and walking travel corridors that will link communities to regional recreation opportunities.

- Develop a safe and convenient bike and pedestrian system for diverse user types and abilities.

a. Design for utilitarian and recreational transportation uses.

b. Design a system that accommodates the needs and abilities of various types of users.

c. Recommend design treatments for on and off road travel corridors.

d. Increase bicyclist and pedestrian safety by planning suitable routes within 1/3 mile of all urban homes.

e. Recommend at least one primary north/south and one east /west bikeway for the following areas: the County; Wisconsin Rapids - both sides of the river; and Marshfield - both sides of Central Avenue

- Use bicycle and pedestrian transportation systems to enhance local and regional aesthetic resources.

a. Establish construction, design and maintenance guidelines that can be used consistently throughout Wood County.

b. Design a rural system that connects the counties diverse landscapes.

POLICY GOALS AND OBJECTIVES

The following goals and objectives establish policies for encouraging walking and bicycling at local levels of government.

- **Meet State and National objectives** for bike and pedestrian transportation.

  a. Double the local percentage of bike and walking trips by the year 1999.

  b. Reduce the current number of bicyclist and pedestrian accidents by 10 percent by 1999.

  c. Promote increased use of bicycling and encourage planners and engineers to accommodate bicycle and pedestrian needs in designing transportation facilities for rural, urban and suburban areas.

- Encourage and promote local **education** programs that focus on the rights, responsibilities and safety of bicyclists and pedestrians.

  a. Publicize safety requirements on city bicycle transportation maps.

  b. Increase safety education programming for school children and average adult cyclists.

  c. Promote enforcement of laws and regulations for all transportation users to respect the rights of bicyclists and pedestrians.

- **Maintain** bicycle and pedestrian systems and facilities so that they are attractive, convenient and safe. Also, pursue alternate strategies to fund maintenance.

- Promote **land-use planning that is responsive to a balanced transportation system,** particularly planning that fosters bicycling and walking such as mixed use development or higher density housing.

- **Monitor** bicycle and pedestrian accidents, evaluate causes and types of accidents.

INVENTORY AND ANALYSIS

The inventory and analysis of factors affecting bicycling include safety, motor vehicle travel characteristics, aesthetics, and maintenance of travel corridors. Personal fitness, time to work, weather, and facilities also affect transportation decisions.

Land Use

Wood County is located in the center of Wisconsin and has a population of approximately 76,000. Most of the county population resides in the urbanized areas of Marshfield and Wisconsin Rapids. For the purposes of this study these urbanized areas will include the following:

Wisconsin Rapids Urbanized Area
City of Wisconsin Rapids
City of Nekoosa
City of Port Edwards
Village of Biron
Town of Grand Rapids

Marshfield Urbanized Area
City of Marshfield
Village of Hewett

According to the 1979 Land Use Analysis for Wood County most growth these urbanized areas experienced the greatest growth; however the towns of Saratoga, Grand Rapids and Cameron experienced significant increases in commercial activity. Projections of residential growth patterns estimated that towns, villages and cities along the Wisconsin River would continue to experience moderate to substantial growth. These growth patterns are significant to planning future bicycle and pedestrian transportation activities.

Landscape Character

The landscape features of Wood County also affect transportation patterns. These features include gently rolling agricultural fields, wetlands, and mixed deciduous and evergreen forests. This diversity is represented in Figure 1 that shows generalized landscape typologies, characterized as follows:

- ***The Wisconsin River Area***: The Wisconsin River flows through the southeast portion of the county and is a dominant feature on the landscape. This river corridor is characterized by rolling wooded topography, oxbow lakes and wetlands. This landscape provides abundant recreation opportunities and quality living environments. The Wisconsin Rapids Urbanized Area is within this region.

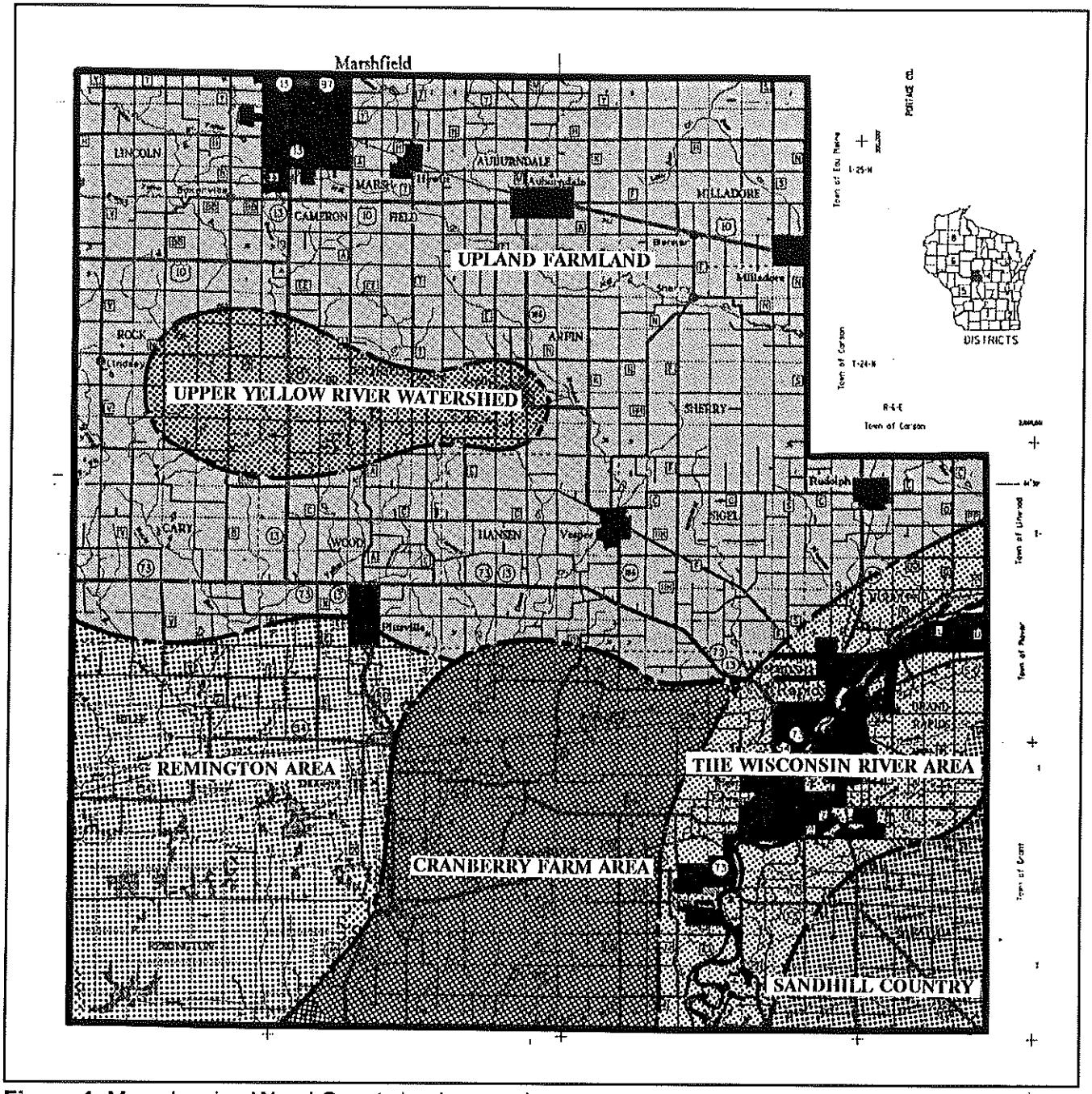


Figure 1. Map showing Wood County landscape character types.

- ***Sandhill Country***: East of the Wisconsin River is a relatively flat, open and sandy area that contains unique agricultural land uses. This area is part of the Sandhill region of Wisconsin.

- ***Cranberry Farm Area:*** In the southern portion of Wood County between the Yellow River and the Wisconsin River region a mixture of wetlands, wooded areas and cranberry farms dominate the landscape. Opportunities to view cranberry operations and abundant wildlife are common in this region.

- ***Remington Wildlife and Wetland Area***: West of the Cranberry Farm region the Yellow River and its tributaries have formed vast, open wetlands that provide habitats for abundant wildlife such as game birds, Sandhill cranes and many varieties of fish and amphibians. Scenic travel corridors and recreational spaces such as the Dexter Park area attract bicyclists and hikers.

- ***Upland Farmland***: Northern Wood County is characteristic of gently rolling Wisconsin Farmland. The City of Marshfield is within this pastoral landscape on the northwest border of the county.

- ***Upper Yellow River Watershed***: Near Arpin, in the center of the upland farm region of Wood County, rolling hillsides have been formed by the Yellow River Drainage. Smaller farmsteads and wooded hillsides of deciduous trees abound. A high concentration of existing recreational areas including North Wood County Park, Powers Bluff, and the Richfield Area Park are within this area.

Highway Transportation

Regional diversity is perhaps most evident when traveling State and County Trunk Highways. USH 10 and STH 54 are the primary east/west corridors through the county, connecting Interstate highway 94 and USH 51 (in the future may become Interstate 39). Other important highways include CTH W, CTH F, STH 73 and STH 13 through Wisconsin Rapids and CTH H, STH 10 and STH 13 through Marshfield. These are important regional corridors for transportation in the county and should be evaluated for potential bicycle and pedestrian use.

Existing Bicycle and Pedestrian Facilities

Many newly constructed county highways near urban areas have five foot wide paved shoulders. Three foot paved shoulders are generally provided in rural locations. These paved shoulders not only provide needed width for touring and commuting bicyclists, but reduce maintenance and increase the safety of all highway users (WisDOT Facilities Development Manual, 11-45-10). Many of these county corridors have been designated by various agencies for commuting bicyclists. The *Wisconsin Bicycle Map* shows recommended routes for touring cyclists in Wood County (Figure 2).

Figure 2. Statewide bicycle routes through Wood County. Taken from the *Wisconsin State Bicycle Map*

In contrast to the bicycle accommodations found at the county-wide level, facilities within urban areas are relatively sparse. Within these urbanized areas the following corridors have been designated for bicycling:

Wisconsin Rapids Urbanized Area

- 1st Avenue South
- County Highway "W"
- The west riverside bicycle and pedestrian path (part of the Hiawatha Trail)
- Port Edwards: Fourth Avenue

Marshfield Urbanized Area

- East Becker Street

In these urban locations sidewalks, crosswalks and other infrastructure for pedestrians are largely provided in all but the most recently developed

subdivisions. Within suburban and township locations, and at the edge of some communities, few pedestrian facilities exist.

Existing bicycle and pedestrian facilities will be integrated into this plan for future travel corridors. A reevaluation of these existing facilities will determine whether additional improvements are necessary. The following planning and design considerations have been explored to identify and recommend additional corridors.

PRIMARY PLANNING CONSIDERATIONS

Several **primary planning considerations** were used to select potential travel corridors and **secondary planning considerations** were used to evaluate corridors and make recommendations for design treatments.

Locating Corridors for Further Evaluation

Although a major objective of this plan is to establish a primary bicycle and pedestrian facility system that is within 1/3 mile of all urban homes, the destinations of bicyclist and pedestrian are as varied as the users. All urban streets, with the possible exception of several highways, will be used at one time or another by bicyclists; but the entire transportation system cannot be planned with facilities. Policy recommendations in this report will address approaches to improve the safety of all urban streets. Facility improvement recommendations will be limited to primary corridors that will link bicyclists to **major** community destinations.

Roadway Corridors

The first step in locating potential travel corridors is to identify existing corridors, community destinations and regional destinations.

Generally, motorized and non-motorized transportation users share similar origins and destinations - merely using different modes to accomplish their goal of arriving at a destination safely and efficiently. The arterials and collectors that effectively deliver many motor vehicles provide the direct and contiguous routes that may also serve the most pedestrians and bicyclists. These systems, however, are not always designed for accommodating the special needs of the average bicyclist. Many of Wood County's State Highways and principal arterials have physical and use characteristics that impede development of bicycle facilities. However, county trunk highways and urban arterial streets and collector streets are generally more amendable to improvements while often effectively connecting prime destinations.

County Trunk Highways

For reasons of consistency and financial considerations, this plan will largely evaluate state and county trunk highways at the regional level. Facility improvements are often financially infeasible for many townships, particularly in Wood County where many town roads are gravel or chip coated. When county and state highways are unsuitable, town roads will be considered as components of the system.

Minor Arterial and Collector Streets

In urban areas of the county, minor arterial streets and collector streets will be the primary roads evaluated. These roads often provide relatively direct linkages to community destinations while lacking some of the traffic, safety and physical constrains of principal arterials. When prime corridors do not fully serve county and community destination needs other roads will be reviewed and evaluated.

Bridges

Bridges alleviate extreme barriers to transportation and therefore are often among the most critical corridors for all transportation modes. Three highway bridges in Wisconsin Rapids offer the only available linkages across the Wisconsin River. The Expressway Bridge is the only bridge designed for bicycle accommodation although all bridges have sidewalks for pedestrians. The Jackson Street and Grand Avenue bridges are selected for further evaluation because these bridges serve the only direct downtown crossing locations. Cost effective methods of improving bicycle accommodations on bridges will be analyzed in this plan.

The bridge crossing at Nekoosa and STH 73 is another significant corridor used by bicyclists and pedestrians.

Miscellaneous Travel Corridors

Other corridors that may not currently serve a major transportation function such as utility corridors, abandoned rail corridors and minor transportation routes have been located and evaluated in the plan. Corridors are identified that may be available for local and regional transportation functions including:

- Wisconsin River Corridor
- Railroad corridors from Port Edwards to Wisconsin Rapids
- Railroad corridors from Wisconsin Rapids to Marshfield and the railroad corridor from Wisconsin Rapids to Lake Wazeecha.
- Greenways and railroad corridors in Marshfield

Overall, a variety of on-street and off-street corridors exist in Wood County for possible bicycle and pedestrian use. Off-street corridors are most abundant in the southeastern quadrant of the county, however greenways and utility corridors will provide future travel corridors in Marshfield and surrounding suburban areas. Whether on-street or off-street the continuity, directness and physical characteristics of these corridors are critical deciding factors for selection.

Primary Planning Implications: 1. In Wood County, like most other areas, bridges are critical to people's mobility and access, and therefore all, or most Wood County bridges should accommodate bicyclists and pedestrians. In Wisconsin Rapids bridges are important, yet restrictive corridors to local bicyclist, and therefore must be evaluated to make recommendations for improvements.

2. Although many of Marshfield's greenways do not presently serve important connectors between destinations, these systems will be important future bicycle and pedestrian transportation linkages. This plan shall identify future transportation uses of Marshfield's greenway corridors.

Potential and Historical Use Patterns.

Determining the potential use of travel corridors for bicycling and walking is perhaps the most important planning consideration. Methods to determine potential use include inventory and analysis of historical use patterns, determining locations of trip generators (origins and destinations), projecting areas of population growth and future land use patterns.

Historical use patterns tell the story of past bicycling and pedestrian activity and are determined by "Means of Travel to Work" census data, mapping accident data, field observations, and secondary literature research.

Census Data

The 1980 and 1990 Bureau of Census Data provides useful information about the primary mode of travel for individuals over age 16. The major limitation of this data for Wood County is that it was collected in March when snow and other northern weather conditions may have dramatically affected bicycling and walking activities. Other limitations of census data are that it does not represent: young walkers or bicyclers, occasional bicycling and walking trips to work among people over 16 years, or travel for purposes other than work (only 1/5 of all trips are work related[1]).

With these limitations in mind census data was used to help estimate levels of bicycle and pedestrian activity. A review of the 1990 census data shown in Table 1 reveals that the levels of walking and bicycling to work are consistent with State and national averages. "Time to Work" census data for Wood County shows that 28% of all trips to work are less than 10 minutes drive - well within the distance most people are willing to bicycle or walk (See General Characteristics of Different types of Bicyclists, Appendix A).

Table 1. National Bureau of Census Data

1990 Bureau of Census Data	United States	Wisconsin	Wood County	City of Marshfield	City of Wisconsin Rapids
Means of Travel to Work					
Total number 16 and over	115070274	2349691	33706	9520	7582
Drove alone	84,215,298 **73.2%**	1,750,791 **78.3%**	26,566 **78.3%**	**7,305** **78.4%**	6,141 **82.9%**
Bicycled	466,856 **.4%**	11,802 **.5%**	143 **.4%**	36 **.4%**	61 .08%
Walked	4,488,886 **3.9%**	130,132 **5.8%**	1,972 **6.1%**	913 **9.9%**	388 **5.2%**
Travel Time to Work					
< 5 minutes	NA	130,968 **5.9%**	2,267 **7.0%**	697 **7.5%**	574 7.7%
< 10 minutes	18,257,921 **15.9%**	517,076 **22.0%**	9,628 **28.6%**	3,773 **39.6%**	2,774 **36.6%**

A review of census data also included comparisons of individual tracts within communities and 1980 information. Together these data show several significant patterns for Wood County:

- More than 1/3 of all trips to work in Marshfield and Wisconsin Rapids are 10 minutes or less.
- In Marshfield pedestrian activity is double the State's average with the greatest level of pedestrians commuting from the northeast quadrant of the city (census tracts 103 and 106).
- In Wisconsin Rapids the percentage of people that bicycle to work is twice the State and national average.

***Primary Planning Implications**: 1. Providing facilities to improve the safety and convenience of existing users is identified as a priority of this plan; specifically, Marshfield's pedestrians and Wisconsin Rapids bicyclists.*

2. "Time-to-Work" data shows a significant potential to increase bicycling and walking transportation modes throughout Wood County particularly in urbanized areas.

Accident Data

In Wood County many serious accidents involving bicyclists and pedestrians have been reported and there are many more minor accidents that go unreported. In the

three years between 1991 and 1993, 72 accidents have involved a bicyclist and 69 have involved pedestrians (see Table 2). The greatest percentage of these accidents have been in urban locations, however most of the fatal accidents are found in rural locations. Higher motor vehicle speeds and poor visibility are likely to blame for these fatal accidents.

NOTE: The following statistical data are useful to this planning process, but it is important to consider that these numbers represent accidents that severely affect individuals, families and the community. For this reason, provisions to increase the safety of pedestrians and bicyclists are of the highest priority.

Table 2. Police Reported Bicycle and Pedestrian Accidents 1991-1993

Bicycle and Pedestrian Involved Accidents					
Location	Mode Involved	Year			
		1991-1993	1991	1992	1993
Wood County	Bicycle	72 (1*)	24	21 (1*)	27
	Pedestrian	69 (4*)	35 (1*)	12 (3*)	22
Marshfield	Bicycle	25	8	7	10
	Pedestrian	35	18	5	12
Wisconsin Rapids	Bicycle	39	14	11	14
	Pedestrian	18	9	4	5

Source: Wisconsin Department of Transportation, Division of Motor Vehicles, Traffic Accident Section, 1994
** Indicates Fatal Accidents*

The times and locations of these accidents were used to **locate possible facility problems** and **to determine historical patterns of use.** Several patterns were documented as a result of plotting accidents for Wood County including:

- Nearly 1/4 of all pedestrian accidents in the county occurred along Central Avenue in Marshfield's Central Business District (CBD). However bicycle accidents were widely distributed through Marshfield.
- In Wisconsin Rapids bicycle accidents are largely concentrated near the intersection of Eight Street and the Expressway and at the intersection of Eight Street and Pepper Avenue. Many accidents along Eighth Street South have been fatal. Pedestrian accidents also occur with some frequency in the downtown area East of the Wisconsin River.
- Outside of the urban areas the township of Saratoga has had the highest number of bicycle and pedestrian accidents.
- 75% of all bicycle accidents have occurred between the hours of 3pm to 7pm, the peak travel times when people are returning home from work and

school. Pedestrian accidents are widely distributed throughout the day.

Primary Planning Implications: ***1. Recommendations for improving pedestrian safety will focus on Central Business Districts, particularly along Marshfield's Central Avenue, and the Towns of Grand Rapids and Saratoga.***

2. Bicycle safety issues are of concern throughout urban areas the county and will require improving facilities and programs to educate bicyclists and motor vehicle users. Particular attention will be given to several urban intersections. Field investigation of these intersections show only minor facility problems and therefore accidents may be attributed to high use.

Potential Use Patterns

Possibly the most important step in the planning process is the evaluation of potential use patterns. Methods to determine the number and types of users include:
- ***Field Observations***
- ***Literature research***
- ***Historical use patterns***
- ***User Surveys***

While the proceeding data are useful for evaluating historical use patterns it is also relevant to determine potential use patterns. In other words, who are the primary users, what are their destinations, how far are they willing to travel by walking or bicycle and what facilities do they desire?

One goal of this plan is to promote transportation activities for all types of bicyclists and pedestrians. To attract the widest range of people, it is necessary to design a system that is easy to access and provides relatively safe and direct routes to major destinations. For the purposes of transportation, these destinations are considered "trip generators" and the best linkages are considered "desire lines".

In this plan two approaches are used for defining trips generators. At the County level recreation destinations and communities are the primary trip generators which will be linked by bicycle and pedestrian routes. In the urban and suburban areas of Wood County, schools, employment centers, residential areas, retail areas, and recreational destinations are among the primary destinations. These destinations are located on the facilities maps pgs 37 - 39. Primary destinations include:

Primary Destinations

Wood County
North Wood County Park
Lake Wazeecha and South Wood County Park
Nepco Lake
Dexter Lake County Park (Dexter)
City of Vesper
Powers Bluff and Richfield Area (Village of Arpin)
Rainbow Casino

Marshfield Urbanized Area
Marshfield Clinic
Saint Joseph Hospital

Wildwood Park
UW-Marshfield Campus
Mid-State Technical College
High School and other area schools
Fairgrounds
Marshfield Industrial Zone
Marshfield Central Business District
Village of Hewitt

Wisconsin Rapids Urbanized Area
Consolidated Papers Mills
Georgia Pacific Mills (Biron, Port Edwards and Nekoosa)
Wisconsin Rapids Central Business District
Mid-State Technical College
The Wisconsin River and related public open spaces
Village of Port Edwards
City of Nekoosa
Town of Grand Rapids
Village of Biron
Eighth Street

How far are people willing to travel by bicycle or walking to these destinations? On average people are willing to commute to work by bicycling and walking if the travel time is less than 20 minutes. For the average adult cyclist this equates to a trip of 2.3 miles (Appendix F provides an overview of trip length and other characteristics for different types of bicyclists). Naturally, the purpose of the trip, type of facilities and other considerations may increase or decrease this average trip length. Although trip distances cannot be changed, this plan will recommend facilities that will recommend the most direct and contiguous linkages between trip-generators.

User Surveys

Citizen surveys are useful for determining local use patterns. A survey of 416 Wood County households was conducted in 1980 for the Bicycle Facilities Plan for Wood County. Important results of this survey are:

- 69% of households surveyed had more than 2 bicycle riders.
- Recreation was the reason 43% of the residents rode bicycle while 57% rode for reasons such as transportation and exercise.
- Nearly 30% of the people responding typically rode more than 2 miles per trip.
- Fully 39% of those questioned rode more than 5 times per week, and 56% of the trips were made on week days.
- Only 1/4 of all respondents have participated in a bicycle safety course.

Although this data is dated, it is evident that bicycling is a significant activity

among Wood County residents. While this level of activity is encouraging, the general lack of safe urban facilities and the low percentage of bicyclists that have participated in safety courses is of concern. Supporting this, it is noted that Wood County ranked 14th among all Wisconsin counties for reported bicycle accidents.

Informal user surveys undertaken as part of this study include meetings with local focus groups and interviews with city, state and county government staff. These meetings were conducted after field observations were complete. Issues concerning existing users were discussed at these meetings and major needs were noted as follows:

- Increasing educational activities for bicyclists.
- Providing safe facilities that would attract more usage of bicycling and walking.
- Providing facilities that would be attractive to recreational users.
- Accommodating bikes and pedestrians at bridge crossings in Wisconsin Rapids.
- Improving linkages to county parks like Nepco Lake and North Wood County Park.
- Providing better bicycle and pedestrian accommodations along 8th Street South in Wisconsin Rapids.

From user surveys it was noted that corridors most often used by existing cyclists include:

Wood County:
STH 54 east of Port Edwards
CTH "W"
CTH "F"
CTH "A"
CTH "Y"
CTH "Z"
CTH "C"
CTH "X"

Marshfield Urbanized Area:
Oak Avenue
Peach Avenue
Becker Avenue
Lincoln Avenue
Galvin Avenue
McMillan Street

Wisconsin Rapids Urbanized Area:
Airport Avenue

Apricot Street
CTH "W"
Griffith Avenue (CTH "Z")
16th Street
17th Avenue

Primary Planning Implications: *1. Even experienced area bicyclists expressed concerns over the lack of facilities such as bicycle lanes and bicycle paths and therefore recommendations for these facilities are included in this plan.*

2. Recommendations for increasing educational efforts relating to the safety of bicyclist and pedestrian is a priority of this plan. The education of local motorists was also expressed as a concern.

Users surveys, census data, existing corridors, land use patterns, accident data and trip generators were analyzed to select corridors that have a high potential for serving future bicyclists and pedestrians. These corridors will be evaluated against secondary design considerations to determine the facilities that will most enhance bicycling and walking activities in Wood County.

SECONDARY DESIGN CONSIDERATIONS

The following secondary considerations were used to evaluate selected corridors, recommend design treatments (facilities), select between alternate routes and prioritize travel corridors for improvements.

Safety and Traffic Conditions

The motor-vehicle ADT (Average Daily Traffic), speed and traffic mix within corridors affect the safety, and therefore the suitability, of corridors for bicycling and walking. Factors that affect bicycling and walking may affect individuals differently depending on their level of experience and personal preference. Appendix F shows several general characteristics of different types of users that help to analyze the suitability or desirability of travel corridors for different people. Three types of bicycle users are generally recognized; the experienced adult cyclist (sometimes referred to as Type A), the average adult cyclist (Type B), and the child cyclist (Type C). Similarly, several types of pedestrians are recognized including: children and elderly pedestrians, pedestrians using means of assisted movement and average adult pedestrians. The design treatments and facilities recommended in this plan will respond to the experience and preferences of anticipated users and to state and national guidelines.

Rural Roadway Traffic Conditions

Roadway evaluation is somewhat different for urban versus rural roads. Because of generally higher speeds and truck traffic on rural roads inexperienced casual adult bicyclists and child bicyclists are not encouraged to use these roads. Therefore evaluation criteria targets the experienced touring and recreational cyclists which have several years of road riding experience. Significant traffic considerations for rural roads include speed, percent of truck traffic and the frequency of conflict encounters (often referred to as squeeze points).

Conflict points are observed when two motor-vehicles and a bicycle share the same lateral cross-section at the same time. Peak travel times and ADT are used to determine the frequency of these conflicts. Conflicts grow exponentially with ADT such that a bicyclists on a road with 900 ADT encounter 1/9th as many conflicts as a bicyclist on a road with an ADT of 1,500 and 1/100th as many conflicts as a bicyclist on a road with 5,000 ADT.

Truck/truck/bicycle conflicts are most hazardous because a truck passing a bicyclist at 45 MPH generate enough aerodynamic force to spill a bicyclist. When the frequency of these conflicts are significant it is recommended that 5-6 feet of shoulder space be available to the cyclist (Note: wider shoulders are generally ineffective because of the debris that collects in the outer reaches of a shoulder).

Urban Roadway Traffic Conditions

On urban roads slightly higher ADT's are suitable for bicyclists because speeds are generally lower than rural roads. Furthermore, unlike rural roads, design treatments may make urban streets suitable for inexperienced bicyclists. ADT, speed, traffic mix and the preference of local users influence facilities or design treatments for bicyclists. Table 4 shows traffic characteristics and evaluations for selected Wood County corridors. Traffic conditions will also affect pedestrian's safety at street crossings and along rural roads.

For both rural and urban roadways, guidelines have been established by state and national bicycle facility guidelines based upon Average Daily Traffic (ADT). Table 3 shows minimum standards prescribed for the cyclists:

Bicycle facility guidelines per motor-vehicle ADT	
ADT	***Bicycle Facility Guideline Recommendation***
Rural: Less than 1500*	Shared Roadways: Bicycle facilities (paved shoulders) are generally not needed but sight distances, traffic mix and peak traffic times are other significant considerations. Rural shared roadways are usually mapped but unsigned.
Rural: over 1500*	Paved Shoulders: Paved shoulders are **not** exclusive rights of way for cyclists but can provide safe accommodations. Freeways and Interstates often restrict non-motorized traffic.
Urban: Less than 2,000**	Shared Roadways: Generally bicycle facilities are not needed however signs and bicycle parking locations are beneficial.
Urban: 2,000 - 10,000**	Wide Curb Lanes, Bicycle Lanes or Paths: Bicycle facilities are determined by a variety of roadway and traffic conditions.
Urban: over 10,000**	Bicycle Lanes or Paths: Bicycle facilities should have restrictive right-of-ways or should be physically separated from motor-vehicle traffic.

** From **Selecting Roadway Design Treatments to Accommodate Bicyclists, 1994**. This data assumes less than 5% truck traffic and 24' total roadway width. In most cases, rural, roads are not recommended for inexperienced bicyclists.*

*** From **Selecting Roadway Treatments to Accommodate Bicyclists, 1994.** See Appendix B. This criteria is based on the Average Adult Cyclist.*

Primary findings of rural and urban safety and traffic conditions include:

- Several selected highways have traffic volumes that would require design treatments such as bicycle lanes or separated paths.

- Heavy truck traffic exists on CTH P near Wisconsin Rapids, Central Avenue and CTH A in Marshfield, Jackson Street in Wisconsin Rapids, and STH 13 and STH 73

***Primary Planning Implications**: 1. To accommodate Wood County pedestrians and inexperienced bicyclists in rural locations off-street paths will*

be proposed.

2. Opportunities to separate bicyclists from traffic on urban corridors with high ADTs or high truck traffic will be evaluated.

In addition to responding to safety and traffic conditions, design treatments will be influenced by physical roadway and travel corridors conditions.

Roadway and Travel Corridor Conditions

Roadway width, number of stops, intersections, curb lane width, surface condition, vehicular parking, and barriers affect the suitability of travel corridors for bicycling. Table 4 shows physical characteristics of the selected corridors. Plan recommendations will be based on these travel corridor conditions as well as other primary and secondary planning considerations.

Evaluation considerations that are particularly significant on rural roads include sightliness and shoulder width. These two factors will affect passing opportunities and therefore contribute to traffic conflicts. Passing opportunities are measured by the percent of yellow line. In general, roadways with net yellow lines greater than 60% become difficult for bicyclist, particularly when shoulders are unavailable.

Sightlines are also important for pedestrian crossings along urban roads, however for urban bicyclists the usable roadway width is the primary physical consideration. Review of Wood County urban and rural corridors reveals the following physical conditions and considerations:

- With regard to meeting state and national guidelines the most restrictive physical condition for most Wood County's bicyclists is narrow curb lanes in urban areas.

- Existing paved shoulders on many rural roadways will adequately accommodate experienced touring and recreational bicyclists.

- Grades and topography are generally not significant transportation evaluation factors in Wood County.

Primary Planning Implications: 1. Recommendations for removing one or both-side parking or widening urban streets at time of reconstruction will be considered to accommodate cyclists.

2. Many of Wood County's rural roads are currently suitable for experienced cyclists.

Cost and Ease of Implementation

The cost of improving bicycle and pedestrian systems is an important factor in recommending facility improvements. In general, the cost of bicycle routes may range from $7,500 to $75,000 per mile and paths from $45,000 to $300,000 per mile. The following construction costs were developed by comparing the average statewide costs[2] to Kerr's Manual of Cost Estimating, 1994[3]. These estimated costs are intended for planning purposes only and will be used later in the report to estimate the cost of recommended facilities.

Estimated Construction Costs per Mile (1994)

- Four foot paved bituminous shoulders $20,000
- Bike lanes/wide curb lanes (3' concrete) $70,000 - $75,000
- Eight foot wide limestone path on railroad grade $35,000 - $40,000
- Eight foot bituminous path (rural) $100,000 - 120,000
- Urban path, basic $180,000 - $200,000
- Urban path, highly developed $300,000
- Signs $500 each or $2,500/mile
- Striping/restriping $5,000
- Bicycle parking, $30 per space

The benefits of a bicycle and pedestrian transportation system to the health and well-being of a community justify the costs. Nonetheless, the financial constraints of providing facilities need to be considered. Infrastructure improvements to accommodate bicycle transportation should be valued on the basis of their cost compared to cost of the overall transportation system and level of service provided by the improvements.

Primary Planning Implications: ***1. Providing bicycle parking and signage on suitable bicycle corridors is a cost-effective means of enhancing conditions for local cyclists. Although many of Wood County's streets will require improvements before signing can take place, providing increased bicycle parking in downtown areas should be a short term goal.***

2. When planned with overall reconstruction of a roadway, the cost of bicycle facilities is dramatically reduced and often provides general transportation benefits. The Near East Expressway (Marshfield) and STH 54 corridors are presently being designed. Both of these corridors are identified as important bicycle and/or pedestrian linkages or crossings. Recommendations for accommodating bicyclists and pedestrians on these roadways have been prepared.

3. Types and availability of funding sources will influence the phasing and development of proposed facilities in Wood County. Potential funding sources are discussed in the Implementation Plan chapter of this report.

Aesthetics

Even for purely utilitarian transportation purposes the aesthetic conditions of corridors influence travel choices. Pedestrians and bicyclists are more affected

by, and aware of, their environment than most motor vehicle drivers. Compared to a motorists, cyclists and pedestrians have a greater affinity for more frequent changes in the landscape character, particularly on county-wide trips.

At this regional scale the prime users will be touring cyclists and recreational riders. To both of these cyclists the aesthetics of corridors is a critical factor. The Wood County Typology Map (pg 11) illustrates the diversity and aesthetic characteristics that regional riders can expect to find in the county. This map was analyzed to help select the most attractive corridors.

In urbanized areas historic and cultural features and natural amenities like riverways or greenways were inventoried and analyzed as factors that attract bicyclist and pedestrian transportation.

Primary Planning Implications: ***1. Wood County has scenic destinations such as riverfront corridors, lakes, parks and other diverse landscapes. These aesthetic features, planned into the bicycling and pedestrian transportation system, will attract people for utilitarian and recreational purposes. Facilities will be designed to enhance local aesthetic and social characteristics to encourage additional bicycling and walking activities.***

2. To attract additional bicyclists and pedestrians for recreation and transportation purposes the County and cities should consider long range plans to acquire further public open spaces along its scenic resources like the Wisconsin River.

Security

Although the security of bicyclists and pedestrians may not be a prime determining factor in Wood County, the potential for criminal acts or harassment still exists and can affect the use of travel corridors. Secluded off-road paths and parking areas are perhaps most prone to criminal acts against bicyclists and pedestrians. Highly used paths are essentially self-policing and therefore off road systems should be designed to attract users through different times of day and season. At times when the use of paths is sparse, such as at night or possibly during the winter months, paths should be closed and bicyclist and pedestrians should use alternate on-road corridors. Generally, urban paths should remain open and visible from other use areas and have appropriate lighting at parking and resting areas; unlit rural paths should be closed after dark to ensure the safety of bicyclists and pedestrians.

A local example of a corridor that can use additional security measures is the railroad corridor from Wisconsin Rapids to Port Edwards. This corridor is in various stages of development and therefore not highly used in the late evening hours. The path is also isolated, and unlit. Although security has not been an issue along this corridor, municipalities should consider closing the path after 10 pm to maintain security.

Primary Planning Implications: 1. Lighting is recommended for all facilities in the central business districts of Marshfield and Wisconsin Rapids. Lighting should also be considered for off-street transportation paths that may be used throughout the evening hours or through the year.

2. Off-street paths should be designed to accommodate restricted access by emergency and maintenance vehicles.

IMPLEMENTATION PLAN

The recommendations in this plan are intended to be implemented by the year 2020. This implementation plan outlines development of facilities and policies that will enhance bicycling and walking activities throughout the county. Elements of the implementation plan include:

- Bicycle facilities plan
- Pedestrian facility recommendations.
- Priority projects
- Funding strategies
- Maintenance of facilities
- Educational and enforcement policy recommendations for bicycling and walking.
- Land-use planning recommendations.
- Action Plan

Bicycle Facilities Plan

Recommendations to designate and improve existing travel corridors for bicycling have been determined using previously discussed primary and secondary planning considerations. Corridor improvements have been designated to improve levels of bicycle activity and help cyclists locate suitable facilities. The vision of the Wood County Plan is to enhance bicycling as an attractive and viable mode of transportation and recreation. This plan recommends that a system of suitable bicycle facilities be implemented and designated by signing and/or mapping appropriate routes. For liability reasons, designated facilities should meet or exceed standard specifications within Wisconsin Bicycle Planning Guidance, 1993 and AASHTO Guide for Developing Bicycle Facilities, 1990.

In this plan, facilities to accommodate the child cyclist are recommended on corridors that serve many youth. Likewise, provisions for experienced adult cyclists will be recommended on some arterial streets and regional corridors. Generally, however, design treatments for Wood County will focus on providing accommodation for the average adult cyclist. **Appendix B, Urban Corridor Facility Development Guidelines** taken from the Wisconsin Bicycle Planning Guidelines identifies urban design treatments for the Group B, or average adult bicyclist. Accordingly, Table 4 shows recommended facilities and design treatments to accommodate anticipated bicyclists.

Bicycle Facility Definitions

Facilities to accommodate bicyclists are defined as follows:

Bicycle facilities - A general term denoting improvements and provisions made by public agencies to accommodate bicycling, including parking facilities, mapping all bikeways and shared roadways not specifically designated for bicycle use (American Association of State Highway and Transportation Officials (AASHTO) definition).

Shared Roadway - Any roadway upon which a bicycle lane is not designated and which may be legally used by bicyclist regardless of whether such facility is specifically designated as a bikeway (AASHTO definition).

Shared roadways (Figure 3) are often effective and efficient facilities that provide common bicycle accommodation within travel lanes shared by motorist. In general, shared roadways are undesignated because of their narrow usable road's surface width that the bicyclist shares with motor vehicles. Nonetheless, roadways with low motor vehicle traffic levels (urban roads below 2000 ADT and below 500 ADT on rural roads) can be designated. Low traffic volumes, in the case of many residential streets, and low speed in some downtown regions can be suitable for bicycling. Whether shared roadways are designated or not, they are an integral part of the bicycle transportation system and provide basic accommodation by providing access to the designated bikeway system.

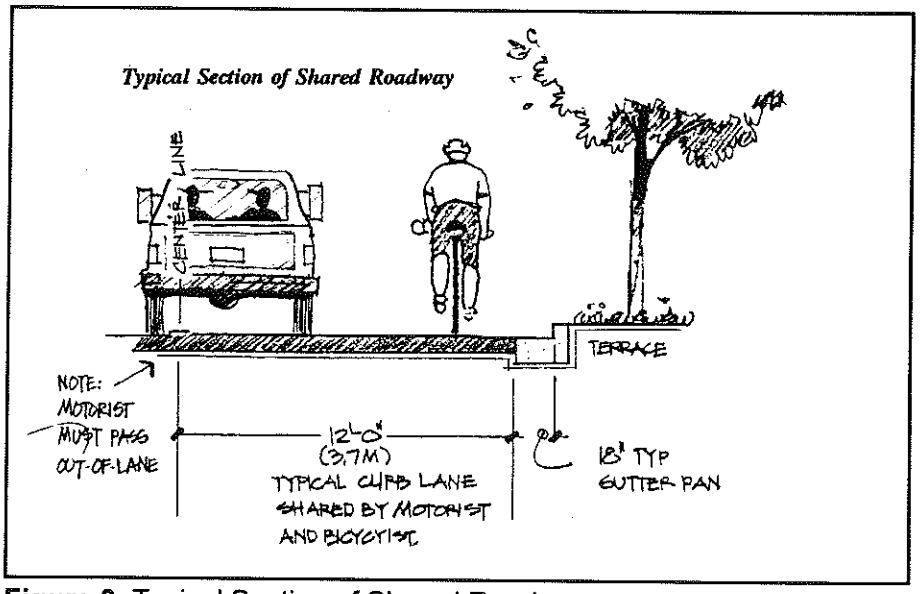


Figure 3. Typical Section of Shared Roadway

Wide Curb Lanes - A right of way shared by motor vehicles and bicycles; wide enough to allow motor vehicles to overtake the bicyclist without changing lanes (Wisconsin Bicycle Planning Guidance, 1993).

Widened curb lanes (Figure 4) provide a width that will generally allow bicyclists and motor vehicle drivers to share the roadway while minimizing conflicts. Generally, 14 feet of usable width is necessary to allow motorists to overtake bicyclists[4]. On-street, without parking, the usable width should be measured from edge of gutter pan to prevent encounters with drainage grates and curbs. Usable width on-street that includes parking should be a minimum of 22 feet from edge of gutter pan to lane stripe.

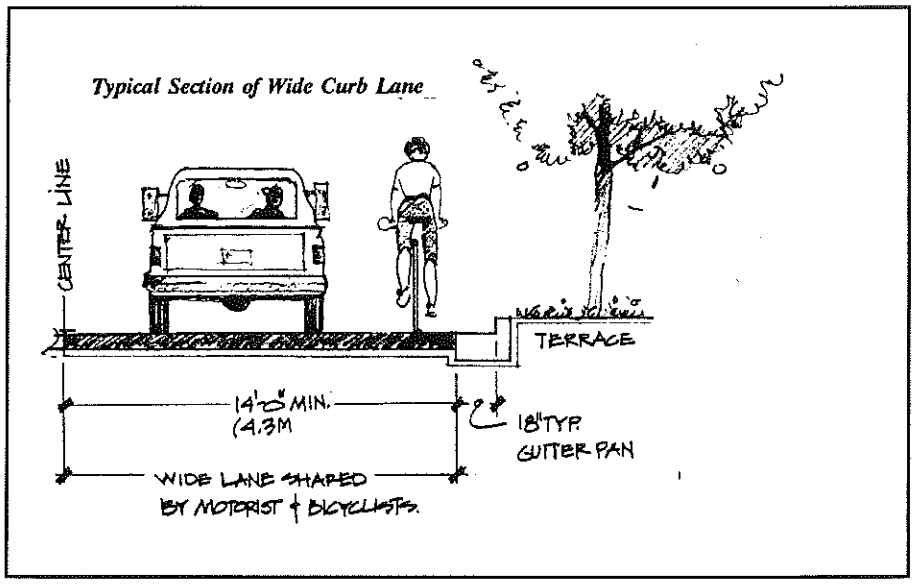


Figure 4. Typical Section of Wide Curb Lane.

Bicycle Lane - A portion of roadway which has been designated by striping, signing and pavement markings for the preferential or exclusive use of bicycles (AASHTO definition).

Bicycle lanes (Figure 5) are delineated in available road space by bicycle lane markings and are intended to give preferential use for respective modes of transportation within a roadway. Properly designed bicycle lanes have been shown to increase the real and perceived safety of bicyclists.[5] Bicycle lanes should carry one-way traffic in the same direction as adjacent motor vehicle traffic and be a minimum of 5 feet wide from curb face or parked motor vehicles.

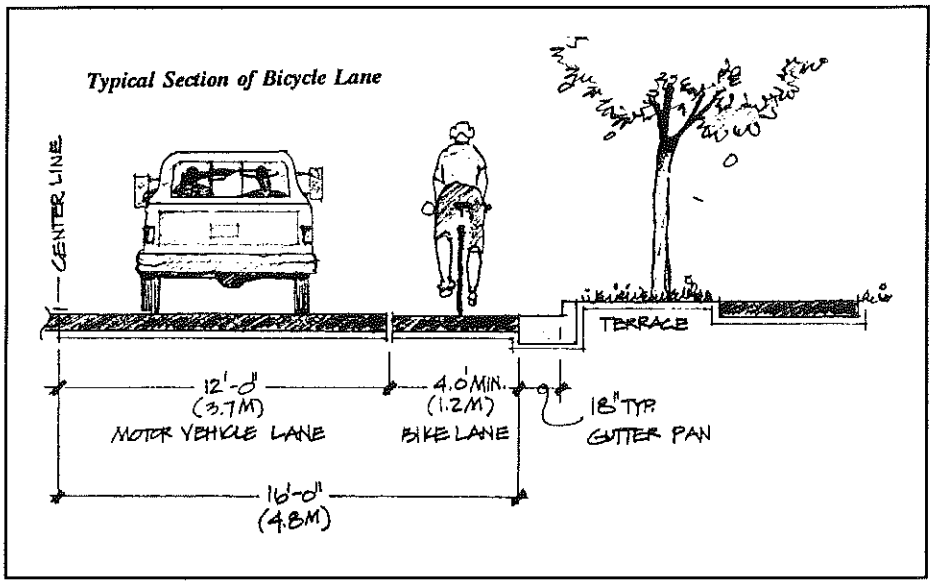


Figure 5. Typical Section of Bicycle Lane

Paved Shoulders - Not exclusively designated for bicycling but outside of the roadway travel lane (See Wisconsin Bicycle Planning Guidance, 1993).

Although paved shoulders (Figure 6) are not exclusive rights-of-way for bicyclists they provide some of the same benefits as bicycle lanes and allow a usable riding space outside of the driving lanes of motor vehicles. To best accommodate bicyclists, shoulder widths should be a minimum of 4 feet without rumble strips. Rural settings are most appropriate for paved shoulders which generally benefit all vehicles.

Bikeway - Any road, path or way which in some manner is specifically designated as being open to bicycle travel, regardless of whether such facilities are designated for exclusive use of bicycles or are to be shared with other transportation modes (AASHTO definition).

Bicycle Route - A segment of a system of bikeways designated by the jurisdiction having authority with appropriate directional and informational markers, with or without specific bicycle route number (AASHTO definition).

Bicycle Path - A bikeway physically separated from motor vehicular traffic by an open space barrier and either within the highway right of way or within an independent right of way (AASHTO definition).

Bicycle paths (Figure 7) may be exclusive to bicycling or may accommodate

pedestrian travel. Paths should be isolated from motor vehicle traffic and therefore provide pleasurable utilitarian and recreational riding opportunities. The recommended minimum surface width of two-way paths is 8 feet, with an additional 2 foot clear zone, free from obstructions, on each side. A width of ten feet is highly recommended especially in highly used urban corridors where many skaters and walkers can also be expected.

Both the Wisconsin Bicycle Planning Guidance and the AASHTO Guidelines for Developing Bicycle Facilities, 1991, provide discussion on other design criteria relating to bicycle paths.

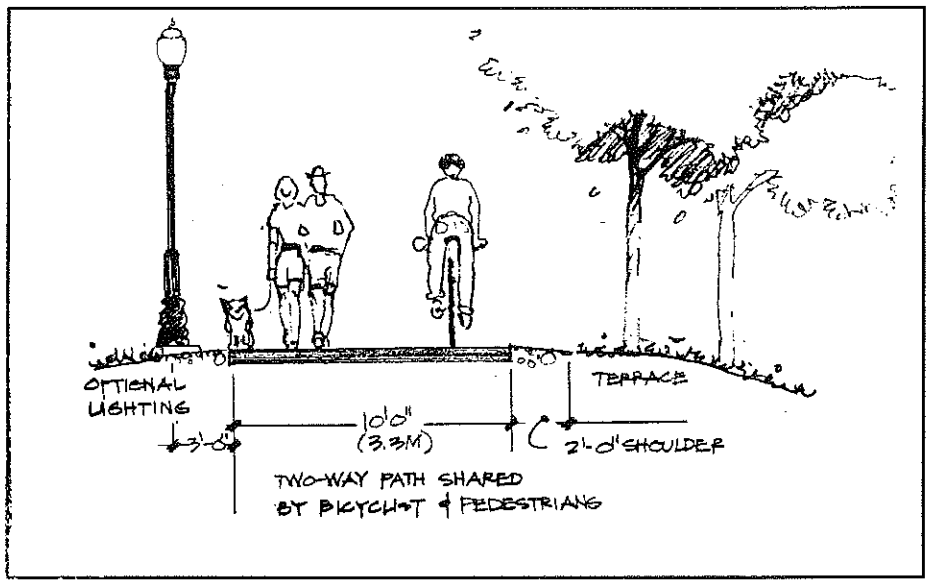


Figure 6. Bicycle Path, Typical Section

Signing

Only suitable designated bikeways should be signed as "bike routes". Segments of the proposed system that require improvements should not be designated with signs or mapping until improvements are complete. It is recommended that all of the county's bikeways will be mapped but signing improvements should be concentrated in urban areas according to state and federal highway standards.

Signing systems for bicycle transportation include basic "route" signs, and pavement markings. The design, placement, operation and maintenance of these systems should be developed according to the Manual of Uniform Traffic Control Devises 1988 (MUTCD)[6]. Standard bicycle route markers should be used on all designated urban bikeways and designated shared facilities. The signing systems shall incorporate information such as direction, location and distance. This information is often useful, particularly on bikeways that serve

regional or visiting bicyclists. On the other hand, directional information may not be necessary on locally used travel corridors such as those within residential districts. Appendix F shows scenarios for signing bicycle routes.

Pavement Markings

In addition to signs, appropriate pavement markings should be placed on bicycle lanes, paved shoulders and bicycle paths to designate restricted rights of way and to direct traffic movement. Pavement markings indicate restricted and shared rights of way and must be consistent with all traffic modes and patterns. For example, at intersections with turn lanes, bike lane markings should accommodate both the turning vehicles and the bicyclists that will continue straight through the intersection. Figure 8 shows one method of accommodating these merging traffic patterns. Bicycle lanes should have 2' clear zones (free of impediments) and should be outside of the parking space of motor vehicles. The following sources are useful for designing specific pavement marking systems:

- Manual of Uniform Traffic Control Devises (MUTCD)
- Wisconsin DOT Facilities Development Manual (FDM)

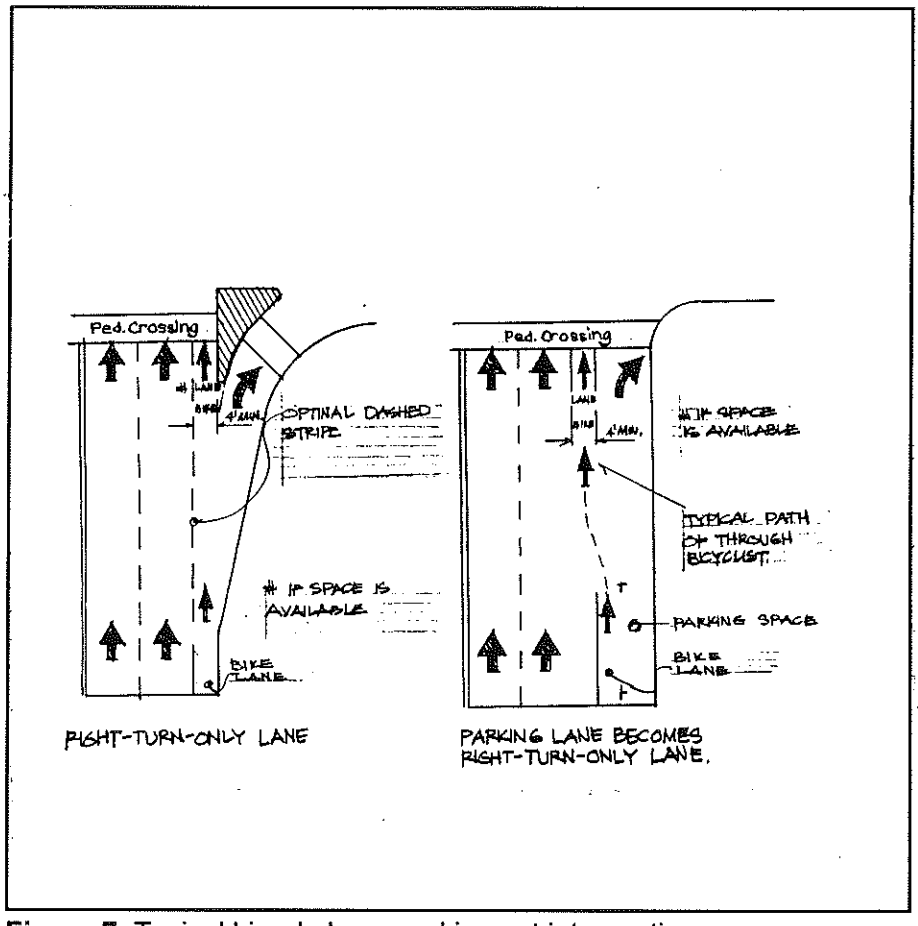


Figure 7. Typical bicycle lane markings at intersections.

Bicycle Parking

Bicycle parking although often overlooked, is one of the most cost-effective means of enhancing bicycling. Parking facilities can affect the security of the bike and rider, the use of bicycle facilities and the aesthetics of the destination (bike racks prevent bicycles from being randomly locked to trees, poles and other site amenities). Destinations such as schools, recreation areas, retail centers, and the downtown should provide highly visible, secure bicycle parking facilities. For most Wood County destinations, minimal or medium security bike racks are sufficient. These units provide opportunities to lock the frame and/or one tire while securing the bike's position. Bicycle lockers may be useful near downtown regions to allow regional travelers and employees to store bicycles and equipment.

Park and Ride Locations

One of the best methods of encouraging bicycle use is to eliminate the conditions that currently discourage its use as a mode of transportation and recreation. Trip distance is one of those factors. Although bicycling is an efficient transportation mode for trips less than 5 miles, trips from suburban locations often exceed this distance. One method of increasing bicycling opportunities to people that typically travel greater distances is to combine bikes with other transportation modes (multi-modal transportation). This multi-modal concept relieves motor-vehicle traffic congestion and parking demands, and increases travel choices.

Public transportation is often a component of the multi-modal concept, however since this form of transportation is limited in Wood County, recommendations will focus on methods to combine the car (or the *single occupant vehicle*) and the bicycle. The objective of car/bike transportation is to get the suburban motorist to park the car at a location at the edge of the community close to bicycle routes and within bicycling distance of the intended destination.

The parking lots of recreational destinations (city parks) often provide these opportunities because parking demand is often low at these locations during peak travel times. Another benefit of parking the car at recreational destinations is that they will be linked to the community by bikeway and pedestrianway connections. The following locations have been identified as possible Park-and-Bike locations for rural and suburban commuters of Wood County and include:

Marshfield:

- Wayside near Wildwood Park
- Charlie Braem Park

Wisconsin Rapids:

- Robinson Park
- South Wood County Park
- Any future park development on the northwest side of the

city.

"Park-and-Ride" or "Park-and-Bike" signs should be placed at these locations to encourage multi-modal transportation options.

Bicycle Facilities Map

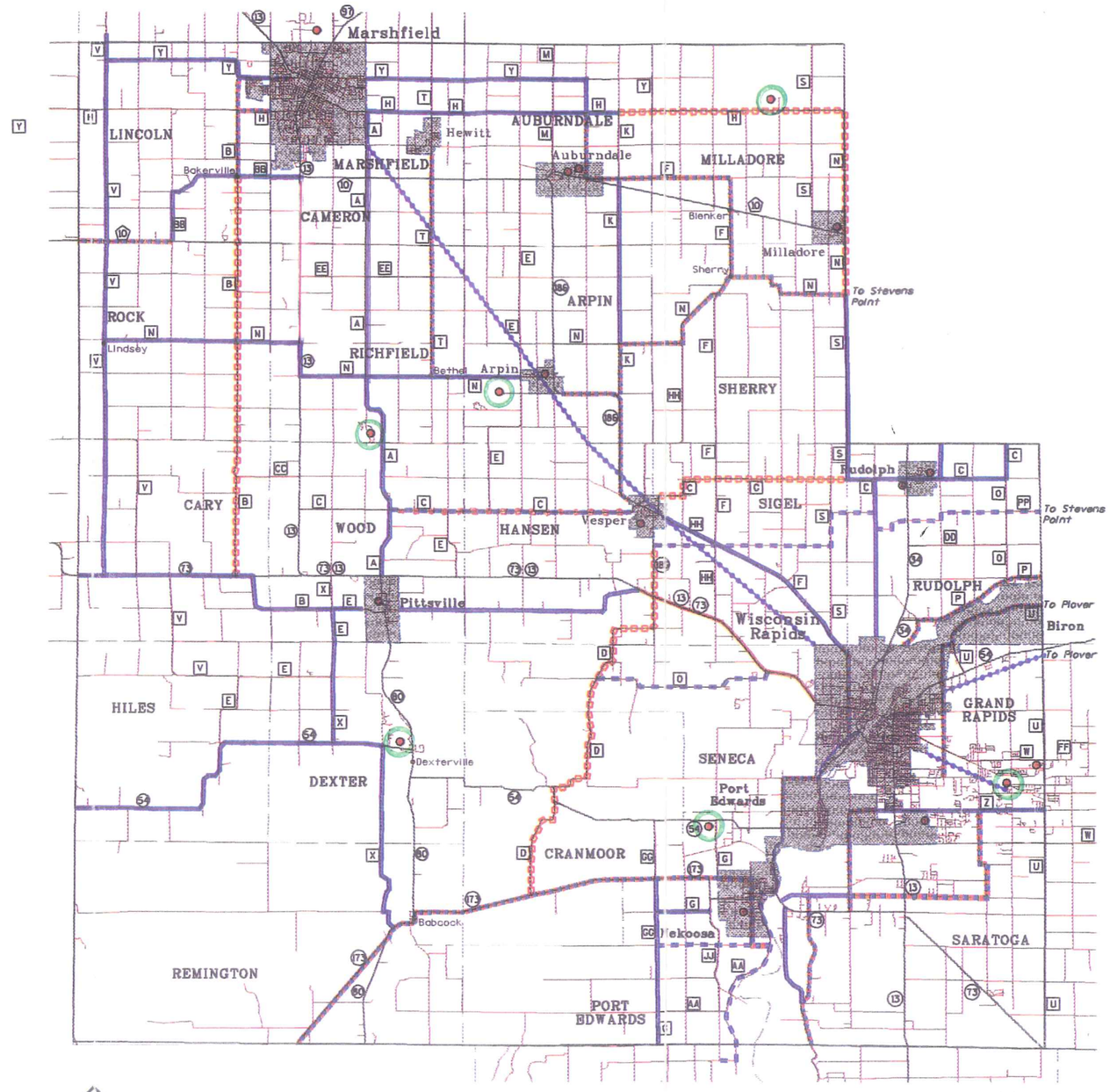
Bicycle facilities are recommended in this plan to provide a safe and attractive bicycling system throughout Wood County. The recommended facilities represent the plan's goals and objective and were selected as a result of the analysis previously outlined. Recommendations for "Future and Alternate Bikeways" are also provided to aid in future planning efforts. Subsequent plan revisions and evaluations should follow every five years according to the criteria set forth in this plan.

It is the recommendation of this report that the bicycle transportation facilities and policies plan be implemented by year 2020 as a component of state, county and municipal transportation activities.

BICYCLE FACILITIES PLAN: WOOD COUNTY

Key to Bicycle Facilities

- Unsuitable or Unrecommended Routes
- Suitable Existing Bicycle Routes
- Suitable Existing Bicycle Paths
- Proposed Wide Curb Lanes or Paved Shoulders
- Proposed Shared Roadway
- Key Destinations

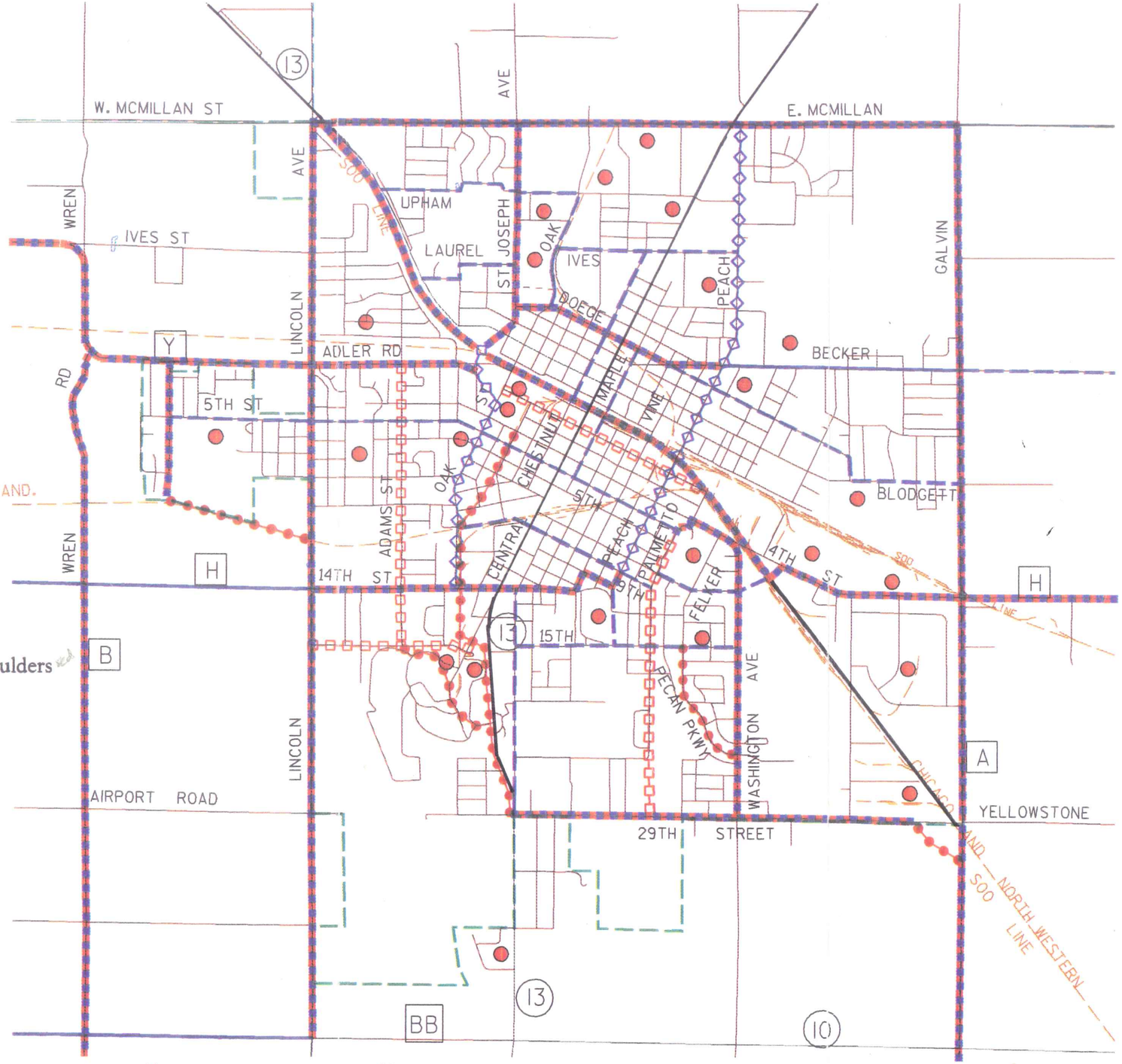


WOOD COUNTY

BICYCLE FACILITIES PLAN: MARSHFIELD

Key to Bicycle Facilities

- Unsuitable or Unrecommended Routes
- Suitable Existing Bicycle Routes
- Suitable Existing Bicycle Paths
- Proposed Wide Curb Lanes or Paved Shoulders
- Proposed Bicycle Lanes
- Proposed Bicycle Paths
- Proposed Alternate or Future Bikeway
- Shared Roadway
- Key Destinations

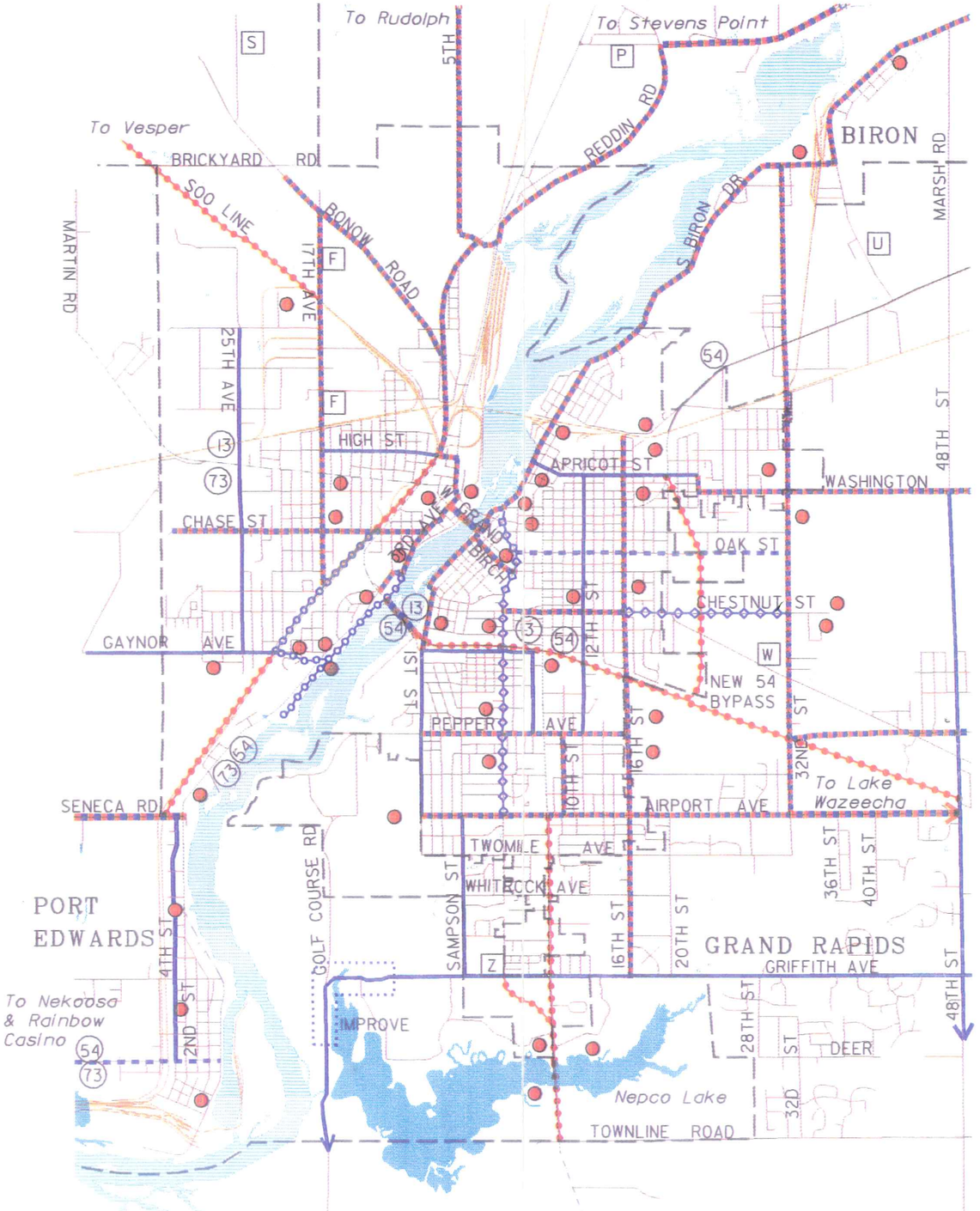


MARSHFIELD

BICYCLE FACILITIES PLAN: WISCONSIN RAPIDS, BIRON, NEKOOSA, PORT EDWARDS, & GRAND RAPIDS

Key to Bicycle Facilities

- Unsuitable or Unrecommended Routes 1
- Suitable Existing Bicycle Routes 2
- Suitable Existing Bicycle Paths 3
- Proposed Wide Curb Lanes or Paved Shoulders 4
- Proposed Bicycle Lanes 5
- Proposed Bicycle Paths 6
- Proposed Alternate or Future Bikeway 7
- Shared Roadway 8
- Key Destinations 9



SCALE IN MILES

WISCONSIN RAPIDS, BIRON, NEKOOSA PORT EDWARDS & GRAND RAPIDS

TABLE 4, Urban Corridor Evaluations for Marshfield Urbanized Area

TRAVEL CORRIDOR	Average Daily Traffic	Traffic mix	Total surface width	Speed Limit	On street parking	Length of corridor (miles)	Recommended bicycle facilities/ Improvements	Improvement costs per mile*	Estimated cost of improvement
BRIDGES									
Oak Avenue Viaduct	NA	NA	NA	NA	NA	NA	Being removed with Near East Expressway work	NA	0
ROADWAY									
ADAMS AVE S. Adler to 17th	250	General	32'	25	Both sides	1.24	SHARED ROADWAY/ ALTERNATE TO OAK sign if being designated	0	0
ADLER RD. Lincoln to Adams	1620 to 2810	General	32' to36'	25	Both sides	0.89	WIDE CURB LANES Remove parking, restripe and sign	75,000	66,750
BECKER AVE Maple to Galvin	1060 to 2880	General	36' section of 22'	25	Both sides	1.43	WIDE CURB LANES Remove one side parking, restripe and sign	7,500	10,725
CHESTNUT AVE Fifth to Blodgett	2740 to 5120	General	30' to 36'	25	Both sides	1.49	FUTURE BICYCLE ROUTE	0	0
DOEGE ST St Joseph to Hume	1500 to 2950	General	32' to 36'	25	Both sides	0.65	WIDE CURB LANES Widen to 36' Remove one side parking, restripe and sign	75,000	48,750
GALVIN AVE 4th to McMillan	480 to 550	Light Truck Traffic	22' to 25'	25	Both sides/ gravel shoulders	2.04	PAVED SHOULDERS 5' paved shoulders, sign	22,000	44,880
GALVIN AVE S.PT. to 4th	2,430	Moderate Truck Traffic	22'	25	Both sides/ Shoulders	0.5	EXISTING PAVED SHOULDERS	0	0

TABLE 4, Urban Corridor Evaluations for Marshfield Urbanized Area

TRAVEL CORRIDOR	Average Daily Traffic	Traffic mix	Total surface width	Speed Limit	On street parking	Length of corridor (miles)	Recommended bicycle facilities/ Improvements	Improvement costs per mile*	Estimated cost of improvement
IVES ST Peach to Oak	1000 to 2000	General	36'	25	Both sides	0.57	SHARED ROADWAY/ ALTERNATE TO DOEGE	0	0
LINCOLN AVE McMillan to Adler	1430 to 2280	Light Truck Traffic	22' to 32' no curb	25	Both sides	1.08	PAVED SHOULDERS 5' asphalt shldr, sign	22,000	23,760
LINCOLN AVE Adler to S. CPL R.	200 to 1080	Light Truck Traffic	30'	25	Both sides	1.62	PAVED SHOULDERS sign	22,000	35,640
MAPLE AVE 6th to Doege	2040 to 3100	General	36' (section of 25'R)	25	Both sides	0.71	FUTURE WIDE CURB LANES to	0	0
McMILLAN ST E Peach to Central	2,170	General	36'	25	Both sides	0.52	PAVED SHOULDERS sign	22,000	11,440
McMILLAN ST W Central to St. Joseph	5,190	General	36'	25	Both sides	0.95	PAVED SHOULDERS sign	22,000	20,900
McMILLAN ST W St. Joseph to STH 13	780 to 1800	General	20'	25	Both sides	0.7	PAVED SHOULDERS sign	22,000	15,400
OAK AVE N Arnold to Upham	3690 to5960	General	30' (Section of 48')	25	Both sides	0.88	ALTERNATE BIKE ROUTE	0	0
OAK AVE S 14th to Adler	6080 to 8137	General	36'	25	Both sides	1.02	BIKE LANES Remove parking, restripe and sign	7,500	7,650
PALMETTO AVE 4th to 29th (future)	800 to 1270	General	26' to 32'	25	Varies	1.15	SHARED ROADWAY sign	2,500	2,875

TABLE 4, Urban Corridor Evaluations for Marshfield Urbanized Area

TRAVEL CORRIDOR	Average Daily Traffic	Traffic mix	Total surface width	Speed Limit	On street parking	Length of corridor (miles)	Recommended bicycle facilities/ Improvements	Improvement costs per mile*	Estimated cost of improvement
PEACH AVE 9th to McMillan	2750 to 5027	Light Truck Traffic	36'	25	Both sides	2.1	BIKE LANES Remove parking, restripe and sign	7,500	15,750
PECAN PARKWAY Entire	75	General	22'	25	Both sides	0.6	SHARED ROADWAY Remove parking, sign	0	0
St. JOSEPH AVE Doege to McMillan	2520 to4270	General	22' to48'	25	Both sides	0.94	WIDE CURB LANES 14' curb lanes, sign	10,000	9,400
UPHAM ST STH13 to St Joseph	3,900	General	36'	25	Both sides	1.47	FUTURE BIKEWAY	0	0
WASHINGTON AVE 29th to 4th	1,490	Moderate Truck Traffic	36'	25	Both sides	1.21	WIDE CURB LANES, remove one side parking, restripe, sign	7,500	9,075
2ND ST Palmetto to Spruce Connect to Oak and Adler via bike path	800 to 3200 will be greatly reduced by Near East Blvd const.	General	24' to 44'	25	Varies	1.01	SHARED ROADWAY sign	2,500	2,525
5th ST Palmetto to Cherry	1,000	General	32'	25	Both sides	0.51	FUTURE /ALTERNATE BIKEWAY	0	0
9th ST Vine to Palmetto	2040 to2340	General	30' to 32'	25	Both sides	0.3	ALTERNATE BIKEWAY	0	0
14th ST Lincoln to Vine	4000 to 5360	General	30' to 44'	25	Both sides	1.36	WIDE CURB LANES Widen entire st. to 44', sign	75,000	102,000

TABLE 4. Urban Corridor Evaluations for Marshfield Urbanized Area

TRAVEL CORRIDOR	Average Daily Traffic	Traffic mix	Total surface width	Speed Limit	On street parking	Length of corridor (miles)	Recommended bicycle facilities/ Improvements	Improvement costs per mile*	Estimated cost of improvement
17th ST Lincoln to Central	250 to 350	General	28' to 32'	25	Both sides	0.7	SHARED ROADWAY Remove one side parking, restripe and sign	7,500	5,250
29th ST STH 13 to Galvin	3,410	Moderate truck traffic	36'	25	Both sides	2.31 T= 29.53	WIDE CURB LANES Remove one side parking, restripe and sign	7,500	17,325 452,095
MISCELLANEOUS TRAVEL CORRIDORS									
PECAN PARKWAY, GREENWAY	NA	NA	NA	NA	NA	0.38	PEDESTRIAN PATH	150,000	57,000
N.E. GREENWAY	NA	NA	NA	NA	NA	Est	FUTURE BICYCLE/PED PATH	0	0
RAILROAD LINE Wildwood Zoo to 5th	NA	NA	NA	NA	NA	1.1	BICYCLE PATH, with signs and lighting	200,000	220,000
RAILROAD LINE Lincoln to UW Marshfield	NA	NA	NA	NA	NA	0.65	BICYCLE PATH	40,000	26,000
WILDWOOD PARK On West side of STH 13 from 29th through park to 17th	NA	NA	NA	NA	NA	0.85 T=2.98	BICYCLE/PED PATH constrt new and widen existing to 8'	125,000	106,250 409,250

GTM = 32.93 mi

859,345

TABLE 4, Urban Corridor Evaluations for Wisconsin Rapids Urbanized Area

TRAVEL CORRIDOR	Average daily traffic	Traffic mix	Total surface width	Speed Limit	On-street parking	Length of corridor	Recommended bicycle facilities /Improvements	Improvement cost per mile*	Estimated cost of improvement
BRIDGES									
Riverview Expressway Bridge		Truck traffic		35	none		SIDEPATH/ SHARED ROADWAY place 54" high railing on south side of bridge. Sign sidepath		0
Grand Avenue Bridge		Truck Traffic		25	none		SIDEPATHS/ SHARED ROADWAY Do not designate, but allow bicyclists to use street		0
Jackson Street Bridge		Heavy Truck traffic		25	none		SHARED ROADWAY Do not designate		0
ROADWAY									0
AIRPORT AVE. 1st to 8th	1,200	General	40'	25	Both sides	0.75	SHARED ROADWAY	2,500	1,875
AIRPORT AVE. 8th to 16th	4,670	General	40'	25	Both sides	0.63	WIDE CURB LANES Remove one side parking, restripe and sign	7,500	4,725
BONOW AVE 4th to 17th	2,000	General	24"	25	Both sides	1.41	EXISTING PAVED SHOULDERS	0	0
CHASE ST 2nd to 17th	1800 to 4480	General	36' to 40'	25	Both sides	0.64	WIDE CURB LANES remove one side parking, restripe and sign	7,500	4,800

TABLE 4, Urban Corridor Evaluations for Wisconsin Rapids Urbanized Area

TRAVEL CORRIDOR	Average daily traffic	Traffic mix	Total surface width	Speed Limit	On-street parking	Length of corridor	Recommended bicycle facilities /Improvements	Improvement cost per mile*	Estimated cost of improvement
CHASE ST 17th to 25th	300 to 1000	General	36' to 40'	25	Both sides	0.62	SHARED ROADWAY, sign	2,500	1,550
CHESTNUT ST 32nd to 16th (future)	5,200	General	40'	25	Both sides	1.3	BICYCLE LANES 42' roadway with one side parking, sign	75,000	97,500
CHESTNUT ST 16th to Lincoln	2860 to 5150	General	40'	25	Both sides	1	WIDE CURB LANES remove on side parking, restripe and sign	7,500	7,500
DALY AVE 3rd to 7th	410 to 1800	General	40'	25	Both sides	0.69	SHARED ROADWAY Remove one side parking when ADT exceeds 2000, sign	2,500	1,725
GAYNOR AVE 3rd to WPCL	2200 to 3920	General	36' to 40'	25	Varies	1.2	WIDE CURB LANES remove one side parking on 36' portion, restripe, sign	7,500	9,000
HIGH ST 4th to 17th	200 to 1310	General	36'	25	Both sides	1.21	SHARED ROADWAY sign	2,500	3,025
JACKSON ST. E 2nd to 4th	6,020	General	52' to 54'	25	Both sides	0.14	WIDE CURB LANES	75,000	10,500
LINCOLN ST Airport to Riverview Expressway	3850 to 4850	General	40'	25	Both sides	1.01	WIDE CURB LANES parking one side, restripe and sign	75,000	75,750

TABLE 4, Urban Corridor Evaluations for Wisconsin Rapids Urbanized Area

TRAVEL CORRIDOR	Average daily traffic	Traffic mix	Total surface width	Speed Limit	On-street parking	Length of corridor	Recommended bicycle facilities /Improvements	Improvement cost per mile*	Estimated cost of improvement
LINCOLN ST Riverview Expressway to Birch	4,850	General	53' to 67' (40' two-lane)	25	Both sides	0.51	BICYCLE LANES Widen to 42', parking one side restripe, sign	75,000	38,250
PEPPER AVE 16th to Lincoln	4250 to 5790	General	40'	25	Both sides	0.78	WIDE CURB LANES remove one side parking, restripe, sign	7,500	5,850
SAMPSON ST Airport Ave to Two mile	600	General	40'	25	Both sides	0.36	SHARED ROADWAY	2,500	900
1ST ST. S. Two Mile to Riverview Expressway	3990 to 5280	General	48	25	Both sides	1.57	EXISTING BICYCLE LANES Move bike lane stripe outside of parking zone	5,000	7,850
1ST AVE. S. West Grand to Riverwalk	900	General	Varies widely	25	Both sides	0.71	SHARED ROADWAY Sign, provide lighting.	2,500	1,775
2ND ST S Mead to Oak	400 to 870	General	36 to 58	25	Varies		SHARED ROADWAY Remove river-side prkg Mead to Grand. Crossing at Grand sign "Bikes Only" onto one-way, restripe and sign	7,500	0
3RD AVE N. West Grand to 1st Ave S	2000 to 3500	General	36' to 48'	25	Both sides	0.36	WIDE CURB LANES sign	2,500	900

TABLE 4, Urban Corridor Evaluations for Wisconsin Rapids Urbanized Area

TRAVEL CORRIDOR	Average daily traffic	Traffic mix	Total surface width	Speed Limit	On-street parking	Length of corridor	Recommended bicycle facilities /Improvements	Improvement cost per mile*	Estimated cost of improvement
3RD ST. S. Expressway to Mead	3500 to 5000	General	28' to 46'	25	Varies	0.35	WIDE CURB LANES Widen narrow section to 30', sign	75,000	26,250
7TH ST. S. Pepper to Daly	1,500	General	36'	25	Both sides	0.5	WIDE CURB LANES Remove parking one side, restripe, sign	7,500	3,750
16TH ST Airport to Apricot	2380 to 7920	General	36' to 48'	25	Both sides	2.18	WIDE CURB LANES Remove one side parking, restripe, sign	75,000	163,500
17TH AVE S. Chase to Russell	2,300	General	40'	25	Both sides	0.25	SHARED ROADWAY Don't sign	0	0
17TH AVE. S. Chase to Greenbay	5,000	General	38'	25	Both sides	1.73	WIDE CURB LANES Remove one side parking, restripe, sign	75,000	129,750
17th AVE. S. Greenbay to Bonow	3,570	General	24'	25		1.73	PAVED SHOULDERS sign	22,000	38,060
25th AVE N. Grand to Gaynor	100 to 200	General	38' to 44'	25	Both Sides	0.84	EXISTING WIDE CURB LANES	0	0
New STH 54 Riverview Expressway	NA	Truck Traffic	48'	35	None		BICYCLE/PED PATH Eight foot wide path to be constructed with new Hwy.	0	0

TABLE 4, Urban Corridor Evaluations for Wisconsin Rapids Urbanized Area

TRAVEL CORRIDOR	Average daily traffic	Traffic mix	Total surface width	Speed Limit	On-street parking	Length of corridor	Recommended bicycle facilities /Improvements	Improvement cost per mile*	Estimated cost of improvement
MISCELLANEOUS TRAVEL CORRIDORS									
Wisconsin River Corridor Along 2nd St S	NA	NA	NA	NA	NA		BICYCLE/PED PATH Signing, bike parking and lighting	250,000	0
Wisconsin River Corridor	NA	NA	NA	NA	NA		BICYCLE/PED PATH		0
Abandon Railline - owned by the city of Wisconsin Rapids through the Town of Grand Rapids. STH 54 to Lake Wazeecha	NA	NA	NA	NA	NA	3.3	BICYCLE/PED PATH	40,000	132,000
Abandoned Rail line: Port Edwards to Wisconsin Rapids	NA	NA	NA	NA	NA	NA	COMPLETE EXISTING BICYCLE/PED PATH	NA	0
Utility Corridor Port Edwards to Nekoosa	NA	NA	NA	NA	NA	1.7	BICYCLE/PED PATH	1.7	2.89
Utility and Railroad Corridor Wisconsin Rapids to Plover - Currently in use.	NA	NA	NA	NA	NA	?	POSSIBLE FUTURE BICYCLE/PED PATH	NA	0
Abandoned Railroad Corridor Wisconsin Rapids to Tork Landfill	NA	NA	NA	NA	NA	?	FUTURE BICYCLE/PED PATH	NA	0

TABLE 4, Rural Corridor Evaluations to Wood County

TRAVEL CORRIDOR	Average Daily Traffic	Traffic mix	Total surface width	Speed Limit (MPH)	Shoulder	Corridor Length (miles)	% yellow line	Recommended bicycle facilities/ Improvements	Improvements cost per mile	Estimated cost of improvement
BRIDGES										
STH 73 Bridge	--	Moderate truck traffic	--	--	--	--	--	Shared Roadway	--	0
ROADWAY										
CTH A South of USH 10	1320 to 1820	General Rural	24'	55	5' Asphalt	16	**	EXISTING PAVED SHOULDERS	0	0
CTH B South of Marshfield to STH 73	540 to 1420	General Rural	24'	55	3' gvl	13	**	PAVED SHOULDERS CTH Y to Bakerville/ SHARED ROADWAY Bakerville south	0	0
CTH C CTH A to CTH P	540 to 990	General Rural	25' to 26'	55	4' grvl	12	**	SHARED ROADWAY	0	0
CTH D STH 73 to Vesper	220 to 480	5% to 10% Truck Traffic	22' - 24'	45 to 55	3' grvl	2	0.4	SHARED ROADWAY	0	0
CTH F Bonow to CTH HH	2930 to 4330	General Rural	24'	45 to 55	5' asphalt	10	**	EXISTING PAVED SHOULDERS	0	0
CTH G Nekoosa to S. CPL	760	General Rural	24'	55	grvl	8	**	PAVED SHOULDERS	22,000	176,000
CTH H Marshfield to CTH K	1820 to 3260	General Rural	24	55	5' asphalt and 3' asphalt	8	**	EXISTING PAVED SHOULDERS	0	0
CTH H CTH K to CTH N	880	General Rural	22'	55	grvl	7	**	SHARED ROADWAY	0	0

TABLE 4, Rural Corridor Evaluations to Wood County

TRAVEL CORRIDOR	Average Daily Traffic	Traffic mix	Total surface width	Speed Limit (MPH)	Shoulder	Corridor Length (miles)	% yellow line	Recommended bicycle facilities/ Improvements	Improvements cost per mile	Estimated cost of improvement
CTH HH	2,930	Moderate Truck Traffic	24'	55	5' asphalt	2.5	**	EXISTING PAVED SHOULDERS	0	0
CTH N	400 to 1330	General Rural	22'	55	grvl	31	**	SHARED ROADWAY	0	0
CTH P STH 13 to CTH C along river	4,330	Heavy Truck Traffic	34'	50 to 55	5' asphalt plus 2' grvl	2.75	0.3	EXISTING PAVED SHOULDERS	0	0
CTH Q	1,070	General Rural	24'	55	3' grvl	6	**	SHARED ROADWAY	0	0
CTH S North of CTH C	880	General Rural	24'	55	3' grss/grvl	13	**	EXISTING SHARED ROADWAY	22,000	286,000
CTH T CTH N to CTH H	600 to 820	General Rural	24'	55	grvl	8	**	PAVED SHOULDERS	22,000	176,000
CTH U	620	General Rural	24'	55	grvl	12	**	EXISTING SHARED ROADWAY	0	0
CTH Y West of CTH T	1200 to 1800	General Rural	24'	55	grvl	5.5	**	PAVED SHOULDERS	22,000	121,000
CTH Z County line to STH 13	1350 to 2350	General Rural	24'	55	5' asphalt	4.5	**	EXISTING PAVED SHOULDERS Improve from Golf Course Rd south	0	0
STH 54 West CPL to Nekoosa	860 to 1470	Moderate Truck Traffic	24'	55	grvl	26	0.3	PAVED SHOULDERS	22,000	572,000
STH 173 CPL to Nekoosa	1420 to 1750	Heavy Truck Traffic	24'	55	grvl	15	0.2	PAVED SHOULDERS	22,000	330,000

TABLE 4, Rural Corridor Evaluations to Wood County

TRAVEL CORRIDOR	Average Daily Traffic	Traffic mix	Total surface width	Speed Limit (MPH)	Shoulder	Corridor Length (miles)	% yellow line	Recommended bicycle facilities/ Improvements	Improvements cost per mile	Estimated cost of improvement
SENECA RD Port Rd to STH 54	150 to 2590	General Rural	24'	55	grvl	0.83	**	PAVED SHOULDERS	22,000	18,260
PORT RD Seneca Rd to Vulcan Plant	1,620	Moderate Truck Traffic	24'	55	grvl	0.48	**	PAVED SHOULDERS	22,000	10,560
MISCELLANEOUS TRAVEL CORRIDORS										
Railroad Corridor from Wisconsin Rapids to Marshfield	NA	NA	NA	NA	NA	21	NA	BICYCLE /PED PATH	35,000	735,000

Pedestrian Facilities Plan

Walking is the dominant form of pedestrian transportation, but assisted movement by the physically handicapped or elderly is also a means of pedestrian travel; therefore virtually all members of the population can be classified as pedestrians at some time during the course of a day. According to the 1990 census, 130,136 Wisconsinites, or 5.5% of the State's population over the age of 16, commute to work by walking. Census data for Wood County shows nearly one in ten walk to work.

Pedestrian Facilities

Wood County and its communities must provide its citizens with a safe pedestrian environment. As mentioned previously in this report, Wood County's existing infrastructure provides good accommodation for pedestrians; however, improving facilities may help to mitigate some pedestrian/motor vehicle conflicts and generate increased pedestrian activity. Facilities contributing to the safety of pedestrians throughout Wood County include:

- Sidewalks: Types of sidewalks, width, surface, location and design.
- Street Crossings: Curb ramps, crosswalks, overpasses and signals.
- Street Furnishings: Lighting, seating and resting areas.

Sidewalks

Pedestrians who walk on the side of a street are endangered by motorists, particularly at night. This situation is one of the ten leading causes of fatal pedestrian accidents nationally. Pedestrians are forced into this hazardous situation when sidewalks or wide shoulders are unavailable to them.

Newer subdivisions in Wood County generally lack sidewalks. The dispersed nature of the developments in townships such as Grand Rapids and Saratoga, and the distances to destinations makes implementation of pedestrian facilities financially less feasible; however, because of the anticipated growth of these suburban areas minimum provisions for pedestrian accommodations should be provided. Provisions should include:

- Paved shoulders and/or sidewalks on arterial and collector streets.
- Mitigate barriers such as narrow bridges.
- Provide path connectors linking culdesacs or other isolated development patterns.

Sidewalks are often unfeasible for many Wood County towns because of dispersed land uses. In these cases paved and gravel shoulders are helpful to pedestrians while cost effective to develop. Shoulders should be a minimum of 4' wide and mailboxes and other impediments should be set back at least 2 feet from the edge of shoulders.

Consistent subdivision ordinances are needed to ensure pedestrian facilities are planned into the initial infrastructure of large developments. Appendix D.

Guidelines for Installing Sidewalks, was taken from Walk Alert: The National Pedestrian Safety Program Guide[7] and provides an example of guidelines for sidewalk provisions that could be used for Wood County.

Sidewalks should be developed on all urban arterial and collector streets, particularly those that serve schools, commercial districts, park and recreation sites, high density residential areas, and bus routes. Urbanized areas in Wood County provide sidewalks to most destinations, with only a few exceptions within the newest residential and commercial developments. Retrofitting sidewalks on at least one side of the urban streets currently lacking sidewalks is recommended and should be scheduled into the local public works projects. Several urban streets recommended for retrofitting include:

Wisconsin Rapids Urbanized Area:

- Chestnut Street: Future link to Mid State Technical College
- Saratoga Street in Wisconsin Rapids: Link to Mid State Technical College.
- STH 13 in Wisconsin Rapids, Town of Grand Rapids and Town of Saratoga: Linkage need to Nepco Lake and the Y-camp. Sidewalk is also needed from to in the Town of Saratoga. Note: Bridges and restrictive rights-of- way will complicate implementation of these sidewalks; however bicycle and pedestrian use warrant facilities along these corridors.
- Pepper Avenue: Lincoln to South 1st (school route)
- 1st Street South: Grove Avenue - Daly Avenue (school route)
- 1st Street North: To Biron along river (confined rights-of-way)
- 2nd Street South: Along Wisconsin River - should have pedestrian lighting and resting areas.
- Two Mile Avenue: 1st Street South to 16th Street (school route)

Marshfield Urbanizing Area:

- Adler Street: Western section to UW Marshfield
- 2nd Street: Develop a bike/ped path through park and armory to Adler after or during construction of Near East Boulevard
- Pecan Parkway: Along greenway
- Lincoln : Future
- McMillan: Future
- Proposed Near East Boulevard: 5' sidewalk from to , including Peach Street Overpass Bridge with a wider sidewalk from Chestnut St. to Maple Street.

Typically, five foot wide sidewalks are sufficient, but additional widths should be considered near school zones, retail centers and recreational destinations. Furthermore, in downtown business districts "bump-out" or "bulb-out" sidewalks should be evaluated to improve pedestrian safety and facilitate road crossings.

A "bump-out" is a variation of the sidewalk design. Bump-out sidewalks are often developed at intersections and mid block pedestrian crossing locations

within downtowns and areas of high pedestrian and motor vehicle traffic. These sidewalks often cover the width from the building face to the edge of curb lane (as seen in figure 9) and therefore, improve driver visibility of pedestrians. These pedestrian facilities have other recognized safety benefits. Although bump-outs can complicate drainage and snow removal they have been shown to:

- Calm traffic by reducing curve radii and curb lane width.
- Effectively shorten the length of the crossing and therefore aid children and elderly walkers.
- Control the location of parallel vehicular parking that often impedes sight-lines at intersection corners.

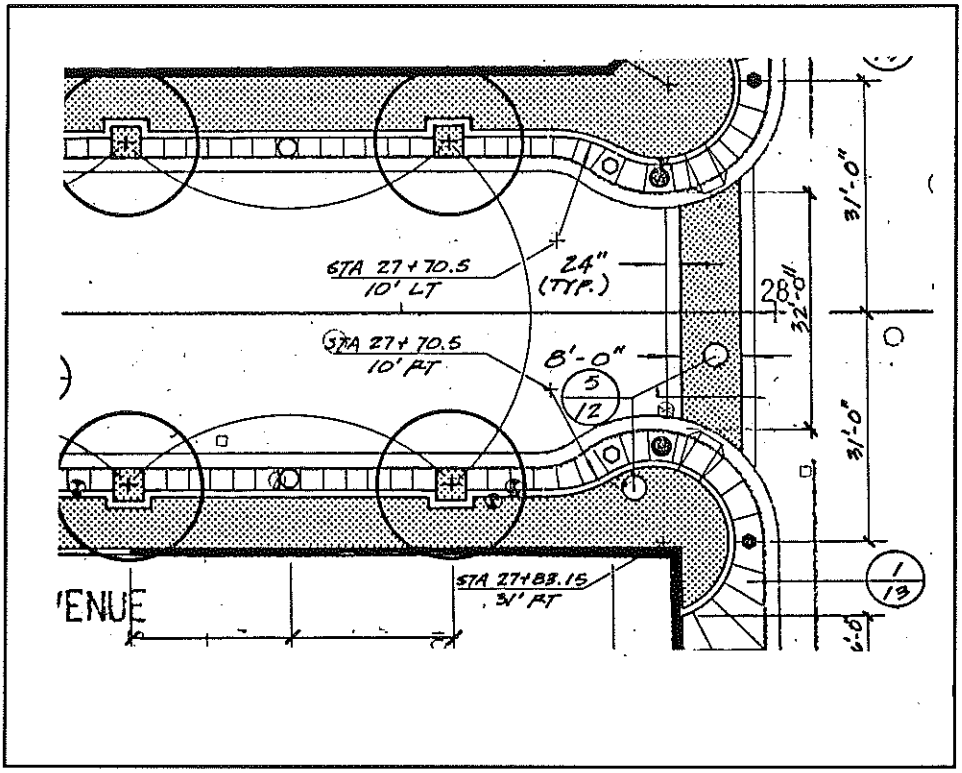


Figure 8. Plan view of typical bump-out sidewalk.

Street Crossings

Crosswalks, ramps and signals are important safety facilities at intersections, and occasionally mid-block street crossing locations. To maintain their effectiveness these features should be used discriminately at locations that have a potential for pedestrian/vehicular conflicts. Crosswalks should be located where pedestrians are highly visible and provide adequate stopping distances for motor vehicles. In general, marked crosswalks should be located:

- At all intersections with pedestrian signals
- At School Crossings
- At or near locations with high volummes of pedestrian crossings

Traffic crosswalks and signals should conform to the Manual of Uniform Traffic Control Devises and WisDOT Facility Development Manual. Crossings should provide visual and textural cues to denote crossing locations. Install parallel striped (Ladder-type) or diagonal striped (Zebra) crossings to enhance color contrast at the most popular crossing locations. In cases where pedestrian crossings are viewed as highly unsafe (such as crossing some principal arterial streets) overpasses may be needed to accommodate pedestrians.

Free-flow, right turn intersections and intersections with large curb radii are particular problems for crossing pedestrians. Large curb radii allow higher speed turning movements for motorists and should be applied with the understanding that pedestrian safety is being compromised for the convenience of motorists. Wood County should limit its use of free-flow right turns and large radius turns at intersections, particularly around school zones and in downtowns.

Pedestrians that are most at risk of being involved in street crossing accidents are children, older adults and people with disabilities. Engineering techniques that will contribute to the safety of these pedestrians include:

- Create special crossings at streets with a high potential for pedestrian and motor vehicle conflicts. High contrast markers, textural clues and safety islands may be useful.

- Change signals to increase crossing time: Typically, 12-14 seconds is sufficient to cross a two lane road (assuming a 40 foot road width and an average walking speed of 4 feet per second), however older adults and people with disabilities may require 16-18 seconds.

Street Furnishings

Lighting, benches, trash receptacles, trees and other street furnishings can improve the security and convenience of pedestrians. Creating rest locations and places to enjoy aesthetic features of the community will help to create a pleasant pedestrian environment. These elements should have a

complimentary design and be located away from intersections and other important sight lines. Avoid random placement of these features. Site furnishings should provide a sense of order and continuity to the travel corridor and should not interfere with pedestrian traffic.

Priority Projects

After considering the factors that affect bicycling safety, implementation priorities were established for Wood County. Priority was given to facilities that would mitigate existing safety problems, and facilities that would provide the most immediate benefit. Priorities also include recommendations for new street construction projects and cost effective facilities improvements. These priority projects are proposed as follows:

Wood County

- CTH "Z" needs paved shoulders along the cranberry bogs near Golf Course Road.

- A strong linkage from Nekoosa through Port Edwards to Wisconsin Rapids is needed for bicycle commuting and recreational cycling. Seneca Road, Port Road and STH 54 through Port Edwards should have 5'-6' paved shoulders. Similarly, Nekoosa should consider a bike path along the Wisconsin River within the Georgia Pacific utility easement to continue from STH 54 south to STH 73.

- Resolve easement issues along rail corridors from Wisconsin Rapids to Vesper.

- Potential bicycle and pedestrian commuting along Airport Avenue warrants paved shoulders.

Wisconsin Rapids

- Signs requiring that bicyclists ride on sidewalks violate AASHTO standards and therefore should be changed to read: "Bicyclists MAY use sidewalk". Complete removal of these signs is also an appropriate option (bridges may be exempt from this policy).

- Wisconsin Rapids and Biron should widen 1st St. N. to provide bicycling space in both directions. The five foot wide shoulder that now exists along one side of this corridor does not meet State and national guidelines because it is used for two-way bicycle traffic. If additional rights-of-way cannot be obtained for this corridor before reconstruction, the extra five feet should be split equally for lanes in each direction.

- Curb cuts are needed for 8th Street islands at the intersections of Riverview Expressway and Grand Avenue.

- Airport Avenue is highly used by cyclists and needs improvement near the section of Two Mile Creek.

- Existing bicycle lane markings on South 1st Street need to be moved outside of the parallel vehicular parking zone.

- Many community members have expressed the need for a bike/pedestrian path on STH 13 between Airport Avenue and the YMCA Camp and Lake Nepco. A sidewalk along at least one side of this corridor is strongly suggested.

MARSHFIELD

- A bike route should be created along Adler Street.

- The city should secure an option to purchase easements on the rail line from Wildwood Park along Oak Street to the Miller Recreation Area Park

- Although it may be difficult to provide facilities for inexperienced cyclists on the proposed Near-East Boulevard, touring and experienced commuting cyclists would be expected to use this corridor because it provides a direct and contiguous link through the community (from CTH "H" and CTH "A" to CTH "Y"). Fourteen foot wide curb lanes should be provided from the 4th St. to Oak St. to accommodate anticipated users.

- The number of bicycle and pedestrian accidents on intersections along Central Avenue points to the importance of good crossing locations. The new Near-East Boulevard should provide push-button activated crossing lights for pedestrians.

- Marshfield's relatively high pedestrian commuting population suggests that the Near-East boulevard should be designed to provide safe conditions for anticipated pedestrians and child cyclists. Sidewalks, 5' wide are suitable for most of the corridor but 8' foot sidewalks are recommended for the section from Chestnut Street to Maple Street because of high pedestrian activity in the downtown.

- A high priority should be placed on providing bicycle and pedestrian facilities on Oak St. and Peach St., which are being partially reconstructed as a result of the Near-East Boulevard. These two corridors are identified as important bicycling and walking travel corridors. Bicycle lanes or wide curb lanes are recommended.

Provisions for support facilities such as bicycle parking are cost effective means of enhancing bicycling and therefore should also be a priority. Bicycle

parking is particularly needed in downtown business districts. **It is the recommendation of this plan that at least 5 parking spaces per block should be provided in Wood County's urban central business districts. Furthermore, parking facilities within downtown areas should be uniform in design and consistent with other street furnishings. Appropriate ordinances should require bicycle parking for downtown areas and other area establishments (See Appendix Item C Bicycle Parking Provisions).**

Priority Pedestrian Recommendations

Pedestrian activity and circulation is important to the retail and commercial trade of Wood County's central business districts. These downtown environments should be safe, convenient and comfortable to pedestrians. Adequate motor-vehicle parking, bicycle parking, benches, pedestrian scale lighting and active storefronts will facilitate downtown pedestrian activity. Furthermore, these pedestrian features should provide a consistent theme that relates to the unique context of the community. **Therefore it is the recommendation of this plan that the city's of Marshfield and Wisconsin Rapids promote plans to provide unified, contextual pedestrian environments within their central business districts. The goal of these plans should be to provide features that enhance pedestrian comfort and safety.**

In Wisconsin Rapids the primary retail areas are found along 8th Street and along Grand Avenue. In the tradition of American mainstreets the retail zone along Grand Avenue is relatively compact with storefronts located next to sidewalks and zero-lot-lines. By contrast, the 8th Street retail zone is linearly dispersed with buildings setback from the street and separated by parking lots. Store-to-store shopping distances are not convenient for pedestrians along this corridor. Furthermore, frequent drive entries reduce pedestrian safety by increasing potential conflicts with motor vehicles. Activities to improve the comfort and safety of pedestrians in the 8th Street region should include:

- Consolidating utilities and signage to improve sightlines.
- Provide canopy trees and other vegetative treatments between parking lots and sidewalks (to maintain good sightlines trees should not be placed in the terrace between the street and sidewalk).
- Provide strong pedestrian oriented corridors along streets perpendicular to 8th Street.
- Limit vehicular access from 8th Street by requiring shared entries and parking lots.
- Develop occasional landscaped seating areas along sidewalk for the comfort of pedestrians.

Figure 10 below illustrates a typical cross section of pedestrian oriented treatments being proposed for 8th Street.

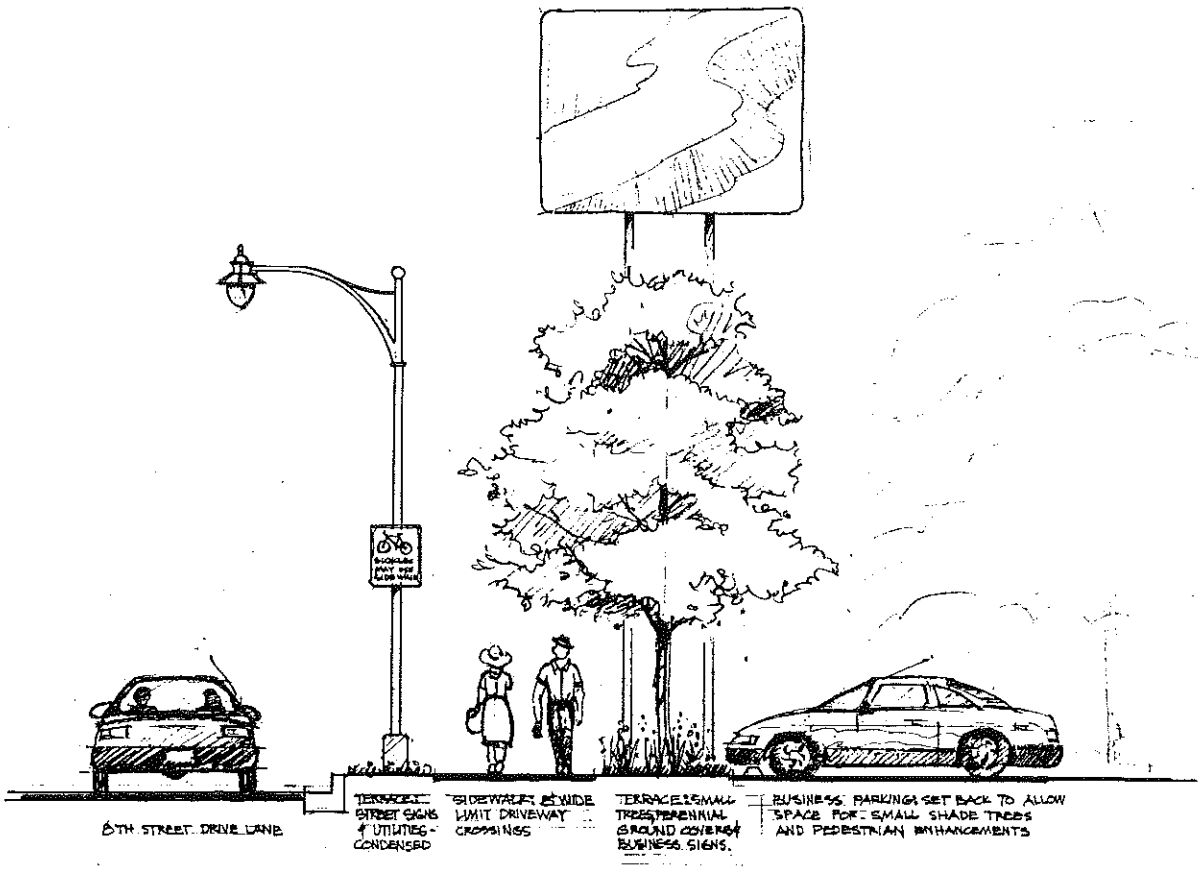


Figure 10. Section showing proposed pedestrian related improvements along 8th Street in Wisconsin Rapids.

Pedestrian safety in the Marshfield's' downtown region would be improved by developing bump-out sidewalks at major intersections along Central Avenue. These pedestrian features are recommended because they effectively calm traffic, improve pedestrian/motor vehicle sightlines and shorten the crossing length. **Bump-out sidewalks should be considered along Central Avenue within Marshfield's central business district.**

Funding Strategies

County and communities should appropriate annual funds for bicycle and pedestrian improvments, just as they do for other roadway projects. In addition to Capitol Improvemnts Programs, special projects may be eligable for state or federal funding.

As part of the state and federal initiatives to enhance bicycle and pedestrian transportation modes several grants and funding sources are available to Wood County for planning, facility development and land acquisition. Although

some grants may be available for improving on-street facilities, opportunities to fund off-street facilities (such as bicycle paths) are substantial - particularly if the facility is intended to provide both utilitarian and recreational benefits (See Appendix A for a complete discussion of "Grants and Aids Opportunities").

The Federal ISTEA Program has helped fund many bicycle and pedestrian transportation activities throughout the United States. Similarly, Wisconsin has approved the funding of many community projects. A Wisconsin component of ISTEA, the State-wide Multimodal Improvements Program (SMIP) is intended to encourage multimodal projects that are "up and beyond" the current transportation activities. In 1997, Wisconsin will submit its last approved projects for the existing Federal ISTEA program. Future funding will depend on a new federal act or similar state appropriations. As part of this planning process several corridors were recommended for 1997 ISTEA, SMIP application.

One objective of this plan is to consider facilities that have overlapping recreation and transportation value. For these recommended bicycle and pedestrian improvements the Wisconsin Department of Natural Resources' Stewardship Program may be an appropriate source of funding.

Alternate funding strategies through private interests should also be considered. Local private interests will benefit from an improved transportation system that offers transportation choices. Private agencies that share Wood County's vision for a bicycle and pedestrian system may be willing to invest in development or maintenance of facilities. Wood County and its communities should continue to explore private partnerships to provide better bicycle and pedestrian facilities.

Table 4 shows the costs of recommended improvements for selected corridors. This capitol improvements program serves as a planning tool to develop suitable facilities for the Wood County Bicycle and Pedestrian system and shows recommended design treatments along with estimated costs.

The Wood County Transportation and economic development Committee should annually review the availability of bicycle and pedestrian funding sources.

References

1. The National Bicycling and Walking Study: Transportation Choices for a Changing America indicates that 21.6% of all daily trips are for the purpose of "earning a living".

2. Average statewide costs of bicycle facilities compiled by Wisconsin State Bicycle Coordinator, 1994.

3. Dietrich, Norman L., (1993). Kerr's Cost Data for Landscape Construction: Unit Prices for Site Development, 12th Edition: Van Nostrand Reinhold, New York.

4. AASHTO Guide for Developing Bicycle Facilities, 1991.

5. Sorton, Alex. Program of Instruction for the Bicycle Planning and Facilities Workshop. October 18-19, 1994

6. Federal Highway Administration, National Advisory Committee on Uniform Traffic Control Devices (1988). Manual of Uniform Traffic Control Devises, Washington D.C.: U.S. Government Printing Office.

7. Federal Highway Administration, National Traffic Safety Administration, and the American Automobile Association (1994). Walk Alert: The National Pedestrian Safety Program Guide: National Highway Traffic Safety Administration, Washington D.C.

OPERATIONAL RECOMMENDATIONS

The development of facilities as outlined above is only one component of enhancing bicycling and walking. Operational procedures such as education, maintenance of facilities, enforcement of vehicle codes, land use planning and promotional activities are critical for elevating the level of safety and convenience of the bicyclist and pedestrians.

EDUCATION AND ENFORCEMENT

Bicycle and pedestrian safety needs to be the highest multimodal transportation priority for Wood County. Although the improvement of facilities is one means toward this end, education and enforcement are perhaps the most effective safety measures. The following recommendations outline bicycle and pedestrian educational and procedures.

Bicycling Education and Enforcement of Vehicle Codes

Bicycles are unique and efficient vehicles that can be operated safely in a variety of conditions. An experienced bicyclist is capable of interacting safely with pedestrians, other bicycles and motor vehicles; both on arterial highways and over rough terrain.

How are the skills that are needed to operate a bicycle in varied conditions learned? The rules of the road that apply to bicyclist, the same as motorists, can be learned through basic drivers education courses. However, these courses are not prerequisites for bicycling nor do these courses typically teach skills that are unique to operating a bicycle. Aptitude for interacting with other vehicles and pedestrians is assumed to be learned through experiences derived from operating other vehicles or from experiences gained on the bicycle. However, experience is not the best teacher for bicycling because safety of the operator is in jeopardy. Furthermore, simply knowing how to operate a motor vehicle neglects the unique characteristics of effective bicycling. Indeed, the lack of uniform, mandatory education procedures compromises bicycling safety as well as opportunities to promote bicycle transportation.

It is the recommendation of this plan that safety programs for Wood County should focus on the following groups:

- Child bicyclist
- Average adult bicyclist
- Motor vehicle operator

Educating Child Bicyclists

Bicycling and walking are the primary means of getting around for children. The child cyclist is most responsive to learning, but also has several unique characteristics that complicate education initiatives. For example, child cyclists do not typically know the rules of the road under which they need to operate. Furthermore, children under the age of ten have limited peripheral vision and ability to judge speeds and distances. Educational programs need to recognize these characteristics of the child bicyclist.

School based educational programs are perhaps the most effective means of increasing a child's cycling abilities[1]. Hands-on training curriculums designed for elementary school students such as *The Basics of Bicycling* developed by Bicycle Federation of America are typically aimed at fourth and fifth grade students and are designed to teach basic bicycling skills. **School based educational curriculums are not currently offered throughout Wood County school districts. These programs are generally recognized as highly effective for elementary aged students and therefore Wood County school districts should consider reinstating programs for the 4th and/or 5th grades.**

Although area schools do not currently offer bicycling or pedestrian curriculums, 1st and 2nd grade students are taught bicycle and pedestrian safety through the programs of local law enforcement offices. These programs vary slightly, however they generally teach children bicycling techniques, rules-of-the-road, bicycle maintenance as well as pedestrian safety. In Wisconsin Rapids the safety officer teaches K through 6th grade students and the "Officer Friendly" program in Marshfield has taught bicycle and pedestrian safety for over 19 years. For more information on these programs contact:

Marshfield: Officer Kevin Sorenson, 384-3113
Wisconsin Rapids: Officer Bill Voight, 421-6205
Grand Rapids: Officer Tom Heiser, 424-1821
Port Edwards: Officer Lonny Radtke 887-3030
Nekoosa: Officer Bill Kautzer, 886-7891

Community safety events such as *safety fairs* and *bike rodeos* are another means of educating young cyclist and promoting bicycling. The involvement of sponsoring community organizations reinforces development of community bicycling activities. Furthermore, promotional activities such as "Bike-to-Work Days" can compliment these educational activities as well as other community bicycling events.

Bike Rodeos have been established in Marshfield, Nekoosa, Grand Rapids, Port Edwards, and Wisconsin Rapids. These programs attract from 100 to 300 students per year on average (1000 students are expected to attend this year's Bike Rodeo in Wisconsin Rapids, which is sponsored by Georgia

Pacific Mills). In Marshfield the Police Axillary sponsors the annual rodeo. It is recommended that Wood County and its communities promote bicycle safety events such as "Bike Rodeos" by helping to locate private sponsors for these programs and by integrating Bike Rodeos into community promotion activities such as, summer Bike-to-Work-Days.

It is also recommended that educational activities throughout the county create bicycle and pedestrian educational programs that are designed to address the special needs of handicapped youth such as the developmentally disabled.

Child educational curriculums and events are most effective when supplemented with enforcement and parental support, and therefore adult bicycling education has increased importance. Adult audiences that should be targeted are the high school aged group and the older adult bicyclists and motorists.

Educating High School Aged Youth

Teen aged youth are often caught up in driving, or learning to drive, motor vehicles and are typically less interested in how to bicycle effectively. Several programs may be utilized to capture the attention of this audience:

1. **Include a bicycle safety component into existing drivers education program**. Available videos and instruction materials on bicycling should compliment motor vehicle driving instruction.

2. **Create an *Effective Bicycling*[2] program that includes techniques of off-road bicycling**. Mountain biking is a popular activity among young adults and therefore a short course including mountain biking techniques may be more attractive to this audience.

3. **Enforce vehicle codes**. Enforcement programs are often effective means to educate adult vehicle operators. Bicyclist and pedestrians share rights and responsibilities with other transportation users. As vehicular operators, the bicyclist must also be held accountable for their actions.

Educating Adult Cyclists and Motorists

Enforcement of traffic laws, promotional information, and public relations campaigns are methods of educating adult bicyclists and motorists. A number of publications are available from the WisDOT that are designed to assist in the education of these adults. The distribution of educational materials to parents and other adults may be made a part of existing school bicycling curriculums. Brochures and videos should also be made available through the local public libraries, the motor vehicle registration office, bike shops, the chamber of commerce office and recreation centers. "Community events announcements"

in local newspapers and radio broadcasts may also help to promote safe bicycling and bicycle related events.

The Cops-on-Bikes Program, such as the one in Wisconsin Rapids, is an effective and efficient method of community policing that also reinforces the validity of bicycling for transportation purposes. **The Cops-on-Bikes program is a useful tool for the enforcement and promotion of bicycling activities and therefore should be considered in the law enforcement agencies of Wood County.**

The Wisconsin Bicycle/Pedestrian Safety Program Manager is a good source for information regarding education and enforcement activities. For more information contact the WisDOT Office of Transportation Safety, Joanne Pruit Thunder, Department of Bicycle and Pedestrian Safety in Madison or the Wood County Emergency Government Office, Courthouse.

A variety of bicycling safety information is available to individuals and communities. Sources for brochure, videos and programs can be obtained from:

Wisconsin Department of Transportation, Maps and Publications Sales
3617 Pierstoff Street, P.O. Box 7713, Madison, WI 53707-7713
(608) 246-3265

Wisconsin AAA - Fracette Hamilton, Traffic Safety Project
8030 Excelsior, P.O. Box 33 Madison, WI 53701-0033
(608) 828-2486

National Safety Council
1121 Spring Lake Drive, Itasca IL 60143-3201
(708) 285-1121

Pedestrian Safety

Effective pedestrian safety programs begin by making the public aware of the significance of pedestrian safety. On a national level nearly one in every five traffic fatalities involves a pedestrian, and over half of these fatalities involved elderly and young people[3]. In Wood County, 69 pedestrian accidents occurred between 1990 and 1993 and four of these were fatal. Several recommended goals for enhancing Wood County pedestrian education are:

- Make pedestrian safety brochures and videos available at local schools, library, sports shops, and recreation centers such as the YMCA.

- Teach pedestrian safety along side bicycle safety in the existing school curriculum.

- Institute and evaluate pedestrian education programs such as "Safe Route Home" and "Walk Alert" programs outlined by the National Pedestrian Safety Guide.

- Evaluate pedestrian crash/accident data to determine accident locations and design countermeasures to prevent future occurrences.

- Promote active enforcement of state vehicle codes, citing not only motorists in violation, but also pedestrians endangering themselves and others.

- Promote better awareness of pedestrians within the curriculum of driver education courses.

For comprehensive pedestrian safety information reference:

Walk Alert: The National Pedestrian Safety Program Guide, (1993). Published by the U.S. Department of Transportation and the National Highway Traffic Safety Administration. 400 Seventh Street S.W. Washington D.C. Attn. Roeeta Rhodes, Division Secretary. (202) 366-1739

Maintenance

Maintenance procedures are important for all forms of transportation. Indeed, poorly maintained facilities can be unsafe or unsuitable for use and therefore increase the city's liability. Periodic and consistent removal of debris, resurfacing, patching deteriorated pavements and removing snow and ice are important procedures for insuring that users are provided with safe and reliable transportation facilities. Signs and pavement markings should be regularly inspected and maintained and trees and other vegetation should be kept clear of travel spaces. **An annual capital improvements program budget should be established to ensure proper maintenance of facilities.** As mentioned previously in the report, the cost of maintenance procedures can be offset through cooperative agreements with private agencies. Consistent and reliable maintenance procedures, however, should not be compromised because of volunteer help.

Policy Issues

The facilities that have been proposed in this plan will accommodate many of the county's bicycling and walking needs. However, these planned travel corridors are only part of the system that will ultimately be used. In fact, most of the city's streets and sidewalks will be used on occasion for various kinds of human transportation. Designated facilities cannot be planned for all city streets, but undesignated streets and corridors can help to connect individuals to the designated transportation system. Therefore, city policies need to regulate the use and development of all infrastructure improvements that affect bicycling and walking. The following policy approaches are recommended to improve the safety of all streets and travel corridors for bicyclists and pedestrians:

- Planning documents such as the "land use plan" and "park and open space plan" should incorporate recommendations for enhancing bicycling and walking.
- All pedestrian facilities must be barrier free and in compliance with the Americans with Disabilities Act.
- Require, by ordinance, adequate bicycle parking in the downtown and at destinations such as schools, recreation sites, employment centers and government facilities. (See Appendix item "Bicycle Parking Provisions)
- Establish a schedule and capitol improvements program to maintain paths and streets.
- Replace parallel drainage grates with bicycle safe models.
- Incorporate some level of bicycle and pedestrian accommodations on all new transportation infrastructure projects.
- Continually enforce vehicle operating rules and regulations for bicyclists and motorists.
- Require, by ordinance, all new collector and arterial street widths to meet AASHTO Guidelines for Bicycle Facilities, 1991.

Land-use and Site Planning

Many Wood County communities currently enjoy a relatively compact urban structure. However the continued success of enhancing multi-modal transportation activities will be drastically affected by future land-use developments. The transportation infrastructure planned into new subdivisions, commercial developments, industrial parks and planned unit developments must address the circulation of pedestrians and cyclists and provide viable transportation choices that supplement motor-vehicle travel. **This report recommends that plans for all plats and Certified Survey Maps should be reviewed by the appropriate planning agencies to ensure proper connections to planned bicycle and pedestrian circulation systems. Furthermore, all arterial streets and collector streets should have sidewalks on at least one side.**

Review of large land developments should consider these factors that affect bicycle and pedestrian circulation:

- If the development includes culdesacs, does the sidewalk and street pattern prevent direct bicycle and pedestrian connections to local and regional destinations? Although culdesacs are often relatively safe for children's play they can also create awkward pedestrian circulation patterns. **Recommend connecting culdesacs with narrow walking and bicycling corridors.**

- Do residential landuse types and densities prevent realistic walking and bicycling opportunities? **Provide a balance of higher densities and mixed-use developments to allow greater transportation opportunities.**

- Are planned commercial developments accommodating to pedestrians and bicyclists? **Recommend commercial locations, circulation patterns and facilities that accommodate human-powered transportation in conjunction with accommodations for motorists.**

A component of the county's land-use plan should include the evaluation and eventual acquisition of additional public open space along the Wisconsin River and Yellow River. As public open spaces these riverfronts can effectively benefit many aspects of the community[4]. These environmental corridors can be developed to:

- Provide transportation and recreation related activities.
- Protect and enhance water quality.
- Provide wildlife corridors in and around the community.
- Enhance the aesthetics of the community.
- Enhance property values and tax revenue.

It is apparent that these benefits have been recognized in Wood County because of the existing public spaces along the Wisconsin River. The county, however, should continue to assess additional riverfront locations to seize future opportunities. From the standpoint of bicycle and pedestrian transportation it is important to provide contiguous linear public spaces to allow for the development of off-street paths. In this regard the linkage of public spaces along riverfronts and drainage ways should be evaluated within overall comprehensive planning efforts.

Making the Plan Work: An Implementation Action Plan

The success of this plan is largely dependant on the actions and support of local people. The Wood County Transportation and Economic Development Committee will act as a "clearinghouse" for information on county-wide bicycle and pedestrian issues; however the implementation of facilities and programs is the responsibility of local individuals, businesses, municipalities, the County and the State. The following matrix proposes a plan for how local interests can get involved to enhance bicycling and walking activities in Wood County:

An Implementation Action Plan for Local Interests	
Local Interest	***Action Plan - How to Improve Local Bicycling and Walking Opportunities***
Individuals	• Increase the frequency of bicycling or walking trips per week and then encourage family member to do the same. • Wear a helmet when bicycling and respect the rules-of-the-road. • Talk to employers about providing incentives and bicycle parking facilities. • Form a local based bicycle and pedestrian focus group. The purpose of this group would be to influence local policies and capitol improvement projects.
Businesses	• Encourage employees to bicycle and walk to work by offering incentives and by providing needed facilities at the workplace such as bicycle parking. • Sponsor city-wide bicycling and walking promotional activities like "Bike Rodeos", "Bike-to-Work Days" and "Walk-to-Work Days". • Adopt or sponsor a local bikeway or pedestrianway. • Survey employers to determine methods to increase bicycling and walking activities.
Educational Institutions	• Offer bicycling and pedestrian educational curriculums. • Survey students to determine methods to increase bicycling and walking activities.

Municipalities	• Integrate bicycling and walking into overall transportation and land-use plans. • Promote bicycling and walking through events. • Consider a Cops-on-Bikes program for local law enforcement. • Improve facilities for bicyclists and pedestrian and integrate improvements into the Capital Improvements Program Plan. • Provide mapping and signing that helps bicyclists and pedestrians get around the community.
Wood County Transportation and Economic Development Committee	• Act as a "Clearinghouse" for bicycle and pedestrian related information. • Annually monitor the progress of projects and evaluate existing facilities, new developments and funding sources.
County	• Integrate bicycling and walking into overall county transportation, recreation and land-use plans. • Maintain a committee that will act as a clearinghouse for bicycling and walking information. • Provide bike/ped facilities that will connect communities and regional destinations. • Provide mapping and signing that helps bicyclist and pedestrians get around the County.
State	• Respond to the needs of local bicyclists and pedestrians by providing appropriate accommodations on State Trunk Highways. • Provide technical information to local units of government.

SUMMARY

Until recently in the United States bicycling and walking have been neglected from serious consideration as transportation modes. This neglect has evolved with the development of sprawling land use patterns and transportation facilities that are predominately designed for motor vehicles. Increasingly the benefits of developing multi-modal systems that afford greater transportation choices are being appraised and the advantages of bicycling and walking are being recognized beyond their recreational values, as viable, healthy, cost efficient and environmentally benign means of travel. This plan has seized many of the county's greatest opportunities to enhance bicycling and walking including:

- Proposing linkages along the Wisconsin River which will provide regional transportation to employees of the five large mills and other employment centers and also provide recreation travel opportunities within the scenic river corridor.
- Proposing safe bicycle and pedestrian facilities within 1/3 mile of all urban homes.
- Recommending bicycle and pedestrian facilities for several State Trunk Highways currently being designed for reconstruction.
- Recommending off-street bicycle and pedestrian ways that are eligible for current funding sources administered by the WisDNR and WisDOT.
- Recommending procedures to strengthen existing education and enforcement activities.
- Involving leaders of the county and its communities who have helped direct this plan.

By capturing these and other opportunities Wood County is in a position to develop the bicycle and pedestrian transportation system recommended in this plan as a means toward enhancing the quality of living and providing better mobility in the county .

References

1. Wisconsin Bicycle Planning Guidelines (1993)

2. *Effective Cycling* is a program of the League of American Wheelman, a bicycling advocacy group.

3. From Walk Alert, 1993

APPENDIX ITEMS:

A. Bicycle and Pedestrian Funding Sources

B. Urban Corridor Facility Development Guidelines

C. Bicycle Parking Provisions

D. Guidelines for Installing Sidewalks

E. WisDOT Cost Sharing Policy

F. Characteristics of Different Types of Bicyclists

G. Typical Bicycle Signing on Roadways

APPENDIX A. BICYCLE AND PEDESTRIAN FUNDING SOURCES

WISCONSIN DEPARTMENT OF TRANSPORTATION ADMINISTERED PROGRAMS

Congestion Mitigation and Air Quality Improvement (CMAQ) Program Funds

A broad program intended to improve air quality by reducing single occupant motor vehicle trips through activities like developing bicycle and pedestrian facilities or improving combined bus/bike/pedestrian transportation choices. These 80 percent matching grants may also fund programs ranging from construction and development projects to education and enforcement.

Federal Lands Highway Funds (Section 1032)

This program matches 80 percent of the costs to construct bicycle and pedestrian transportation facilities on roads, highways and parkways through public lands and Indian reservations. The program is administer by WisDOT and each MPO. Wisconsin will distribute funds in the Forest Highways portion of this program.

National Highways System (NHS) Fund (Section 1006)

This Federal/State program is administered by the DOT and MPO. It provides 80 percent grant assistance to local governments for the construction of bicycle and pedestrian transportation related facilities adjacent to any highway on the National Highway System (Other than the Interstate System). Facilities must be pursuant of an overall plan approved by each MPO and State.

Scenic Byways Program Funds (section 1047)

The program assists construction of bicycle and pedestrian related facilities along scenic highways.

Surface Transportation Program (STP) (section 1007)

Ten percent of the State's annual STP funds are available for Transportation Enhancement Activities (TEAs). In Wisconsin these enhancements are grouped under the Statewide Multimodal Improvements Program (SMIP). Two of the ten different activities eligible for funding under SMIP are specifically for the enhancement of bicycle and pedestrian facilities: one for the conversion and use of railway corridors and the other specifically for improved bicycle and pedestrian facilities. Bicycle and pedestrian projects must have a utilitarian transportation emphasis. SMIP funds will match 80% of the cost of projects.

WISCONSIN DEPARTMENT OF NATURAL RESOURCES

ADMINISTERED PROGRAMS

Aids for the Acquisition and Development of Local Parks (Section 23.09(20)

As the name implies this WDNR administered program provides 50 percent matching funds for acquisition and development of public outdoor recreation areas. Local governments must have an approved Comprehensive Outdoor Recreation Plan.

LAWCON (Public Law 88-578 (1964)

A State/Federal program administered by the WDNR provides 50 percent matching grant assistance to local governments for the acquisition of land for public outdoor recreation. Projects must be consistent with the state outdoor recreation plan.

Urban Rivers Grant Program ( )

A State program that provides local government units 50 percent grant assistance for improving access and public recreation opportunities along urban riverfront.

Urban Greenspace (Section 23.09(19))

Objectives of the Urban Greenspace Program are to provide natural or noncommercial gardening space in urban areas and to protect scenic ecological or natural values from urban development. As part of the State's Stewardship initiative 50% funding is contingent on having an approved Comprehensive Outdoor Recreation Plan.

National Recreation Trails Fund (Section 1302)

The intent of this program is to assist in the development of various recreational trail facilities. The WDNR administers this program that provides 50 percent grant assistance to local governments for non-motorized and motorized trail use projects that are consistent with the Statewide Comprehensive Outdoor Recreation Plan.

OTHER RELATED GRANTS AND PROVISIONS

Wisconsin Department of Transportation provisions for bicycle and pedestrian accommodation

The policy of the Wisconsin DOT is to accommodate bicycle uses on any state trunk highways that carry an average of more than 1000 motor vehicle trips per day and carrying two-way bicycle traffic of more than 25 bicycles per day during normal bicycling season.

Bicycle and pedestrian accommodation on bridges (Section 1033)

When a highway bridge deck is built or replaced using Federal funds and where bicycles are not restricted from that highway the bridge must provide accommodations if the Secretary of Transportation determines that bicycles can be safely accommodated at a reasonable cost.

Section 402 Funding

Under Title II, Section 2002 of ISTEA, pedestrian and bicycle safety are priorities for highway safety program funding. This safety grant program sets priority status for bicycle and pedestrian safety.

Federal Transit Funding

Title III section 25 of ISTEA provides funding for improving bicycle and pedestrian access to transit.

MISC.

Heritage Tourism Projects
Local Roads Improvement Program
Joint-Use Corridor Developments (ie Sharing costs of acquisition and development with utility companies)
Board of Commissioners of Public Lands
Business Improvement Districts (BIDs)
Rails-to-Trails Conservancy

Appendix B
Urban Corridor Facility Development

Group B Bicyclists • Urban Section

average motor vehicle operating speed	annual average daily traffic volume (AADT)											
	less than 2,000				2,000 – 10,000				over 10,000			
	adequate sight distance		inadequate sight distance		adequate sight distance		inadequate sight distance		adequate sight distance		inadequate sight distance	
		truck, bus, rv				truck, bus, rv				truck, bus, rv		
20–30 mi/h	wc 14	wc 14	wc 14	wc 14	wc 14	wc 14	wc 14	wc 14	bl 5	bl 5	bl 5	bl 5
30–40 mi/h	bl 5	bl 5	bl 5	bl 5	bl 5	bl 6	bl 6	bl 5	bl 5	bl 6	bl 6	bl 5
40–50 mi/h	bl 5	bl 6	bl 6	bl 5	bl 5	bl 6	bl 6	bl 5	bl 6	bl 6	bl 6	bl 6
over 50 mi/h	bl 6	bl 6	bl 6	bl 6	bl 6	bl 6	bl 6	bl 6	bl 6	bl 6	bl 6	bl 6

Key: wc = wide curb lane bl = bike lane

From: WisDOT, Wisconsin Bicycle Planning Guidance, 1993

Appendix C

Bicycle Parking Facility Recommendations

Land-use of Development Type	*Number of Bicycle Parking Spaces Recommended*	*Type of Bicycle Parking Recommended*
Primary or Secondary School	*10% of the number of students*	*Rack to lock bike frame and one wheel, should secure bike position.*
College or University	*8% of the number of students*	*Rack to secure whole bike, lighting essential.*
Shopping Mall/Retail Stores	*1 space for every 20 motor vehicle spaces*	*Rack to lock bike frame and one wheel.*
Commercial Street/Downtown	*5 spaces per block of storefront*	*Rack to lock bike frame and wheel. In downtown areas with more than 1000 employees provide bike lockers or enclosures.*
Recreation Center/Parks	*1 spaces per 10 motor vehicle spaces, 5 spaces minimum*	*Rack to lock bike frame and wheel. Lighting essential.*
Office Work Place	*1 space per 20 motor vehicle spaces*	*Racks to secure whole bike. Offices with more than 200 people should provide indoor or enclosed spaces.*
Industrial Work Place	*1 space per 30 motor vehicle spaces*	*Racks to lock bike frame and one wheel.*
Library/Gallery/Zoo	*1 space per 15 motor vehicle spaces, 5 spaces minimum*	

Prepared by: Schreiber/Anderson Associates, 1994

Appendix D

Guidelines for Installing Sidewalks

From: Walk Alert: National Pedestrian Safety Program Guide

Types of areas (land-use, roadway functional classification, or dwelling units)	**Where do you need sidewalks . . .**	
	. . . with new urban and suburban streets?	*. . . with existing urban and suburban streets?*
Commercial and industrial — all streets.	On both sides of these streets.	On both sides of these streets — make every effort to add them and to complete missing links.
Residential — major arterials.	On both sides of these streets.	On both sides of these streets.
Residential — collectors.	On both sides of these streets.	*For multi-family dwelling* — on both sides of these streets. *For single-family dwellings* — on at least one side of these streets.
Residential — local streets with more than 4 units per acre.	On both sides of these streets.	Preferred on both sides, but required for at least one side.
Residential — local streets with 1-4 units per acre.	Required on one side, but preferred on both sides.	Preferred on at least one side. At least 4-foot shoulder required on both sides.
Residential — local streets with less than 1 unit per acre.	On one side of these streets preferred, but shoulder on both sides required.	Preferred on at least one side. At least 4-foot shoulder required on both sides.

Notes:

1. You must have a sidewalk on at least one side of any local street that is within two blocks of a school and that is a walking route to that school.
2. You may omit a sidewalk on one side of any new street when that side of the street clearly cannot be developed and when there are no uses or planned uses for that side of the street that would encourage people to walk there.
3. When a main road has a service road, you may eliminate the sidewalk next to a main road if you replace it with a sidewalk on the far side of the service road.
4. When you have a rural road that is not likely to serve development, you must provide a shoulder at least 4 feet in width. If the road serves as a primary highway, the shoulder should be 8 feet wide. The shoulder should be made of a material that provides a stable, mud-free walking surface.

6.2.3 Cost of Conditioning and Maintenance -

The cost for conditioning and maintenance of a designated detour route(s) (Wis. Stats., 84.02(10)) is not eligible.

6.2.4 Payment For/Or Repair of Damages -

Payment for/or repair of damages to roads or streets caused because of their use in hauling materials incident to the improvement (Wis. Stats., 84.20) are not eligible.

6.2.5 Resurfacing -

Resurfacing is considered an improvement and therefore WisDOT's responsibility if the mat is continuous and more than 2 inches deep. Intermittent mats and mats of 2 inches or less are considered maintenance and the responsibility of the local jurisdiction.

6.2.6 Project Costs -

Other project costs not specifically listed above are eligible at the same rate as if the items were on a State Trunk Highway project.

6.3.0 PROJECT COSTS ELIGIBLE FOR STATE FUNDING

Some project costs are eligible for state or federal funding on urban non-freeway projects for a State Trunk Highway. Eligible for funding means that only certain costs qualify for state or federal monies. Urban means the project has an urban cross section where urban type development exists or a section where urban type development is planned, or may reasonably be expected. Local agreements are required for all projects that involve participation.

6.3.1 Street Construction -

All usual items of street construction (grading, paving, etc.) which are an integral part of a construction project are eligible.

6.3.2 Preconstruction Engineering -

All preconstruction engineering costs which are necessary for the construction project are eligible except as noted in 6.2.1.

6.3.3 Right-of-Way -

The acquisition of the necessary right-of-way in order to construct the project is eligible.

6.3.4 Sidewalks -

Replacement sidewalks necessitated by street/road construction are eligible if the local jurisdiction agrees to accept responsibility for sidewalk repair, maintenance, and replacement (other than that caused by future highway projects).

Where sidewalks do not already exist, provision will be made for sidewalks as part of the project design for all reconstruction and recondition type projects at state expense. Provision for new sidewalk consists of purchasing the right-of-way and grading a berm so that a sidewalk may be installed.

6.3.5. Driveways -

When replacement driveways are necessitated by street or road construction and there is a sidewalk, concrete from curb to sidewalk and replacement in kind beyond the sidewalk is eligible. When there is no sidewalk, replacement in kind beyond the curb is eligible. New driveways are not eligible.

6.3.6 Storm Sewer-

Laterals are eligible. Trunk line sewers needed to accommodate surface water naturally flowing to the street are fully eligible in the ratio that the estimated cost of the sewer needed to accommodate the water naturally flowing from the street bears to the total estimated cost of the sewer to be constructed.

6.3.7 Street Lighting-

Replacement street lighting necessitated by the street or road construction is eligible if the affected jurisdiction(s) agree to accept responsibility for energy, operation, maintenance, and replacement of the lighting system (including associated costs). In urban areas, provided the affected jurisdiction(s) accept responsibility for the energy, operation, maintenance and replacement of the lighting system (including associated costs), new continuous street lighting designed to national standards adopted by WisDOT is 50 percent eligible.

WisDOT will participate in the cost of new continuous street lighting only if they are installed at the time of project construction, except as it may qualify under special funding programs specifically for lighting. Where an alternate design acceptable to WisDOT is installed, 50 percent of the cost equivalent to lighting meeting WisDOT standards is eligible, not to exceed 50 percent of actual cost.

6.3.8 Landscaping -

Landscaping is 75 percent eligible when placement is in the right-of-way or when local jurisdiction arranges for placement on private property in cases where there is insufficient space in the right-of-way.

Landscaping will be consistent with the adopted WisDOT standards (limited to trees and shrubs as appropriate). It shall be designed as part of all urban projects provided the local jurisdiction or property owner accepts responsibility for the maintenance of the landscaping items.

Where possible, landscaping design should be consistent with the community's landscaping practices.

6.3.9 Traffic Signals -

Traffic signals necessary and warranted for the safety and efficient flow of traffic within the construction project limits are eligible.

6.3.10 Street Signs, Parking Meters and other Items Not Essential for Service to Moving Traffic -

Any item not necessary for the safe and efficient movement of traffic are not eligible for state or federal funding.

6.3.11 Installations -

New installations of or alteration of sanitary sewers and connections, water, gas, electric, telephone, telegraph, fire or police alarm facilities, parking meters, and similar utilities are not eligible.

Appendix F. Generalized characteristics of different types of bicyclists

Variables	Experienced Cyclists, Type A	Average Adult Cyclists, Type B	Child Cyclists, Type C
Percent of all cyclists[1]	6%	52%	42%
Maximum average speed[2]	15 miles per hour	8-10 miles per hour	5 miles per hour
Maximum average trip length[3]	20 minutes or 5 miles	20 minutes or 2.4 miles	10 minutes or 1 mile
Common type of trip/Geographic topology	Utilitarian and some recreational/ Subregional, regional, neighborhood	Recreational and some utilitarian/ Regional - non destinational, neighborhood	Largely recreational however may make utilitarian trips to school/ neighborhood
Preferred facilities	Arterial and collector streets	Bikeways such as bike lanes, routes and paths; also residential streets	Sidewalks, bicycle paths and residential streets
Common concerns	Curb width, number of stops and directness of route.	Motor vehicle traffic	Motor vehicle traffic
Common accident types[4]	Overtaking	Crossing patterns	Drive-outs
Education and Experience	Knows the rules of the road and generally obeys them. Knows methods to avoid accident situations.	Knows the rules of the road but often disregards them. Often unfamiliar with proper methods of avoiding accidents.	Generally unfamiliar with the rules of the road.
Physical ability	Generally physically fit.	Varies widely	Physical disabilities such as poor peripheral vision and poor judgment of traffic speed, traffic gaps, and direction of sounds.
Environmental effects	Accustomed to different terrain, weather and other environmental conditions.	Generally affected by steep terrain and poor weather or road conditions.	Affected by environmental conditions.

[1] Bicycle manufacturer's Sales Data, 1980

[2] Average Speeds for level terrain. Bicyclist speed may vary according to purpose of trip, condition or location of bikeway, environmental conditions and ability of individual cyclists.

[3] Several studies have shown that 20 minutes is the average high travel distance for adult cyclists traveling for utilitarian purposes. Pennsylvania and Tennessee studies showed average trip length to work to be 2.55 miles.

[4] General analysis of Cross-Fisher Study

Prepared by Schreiber/Anderson Associates

G. Typical Bicycle Signing on Roadways

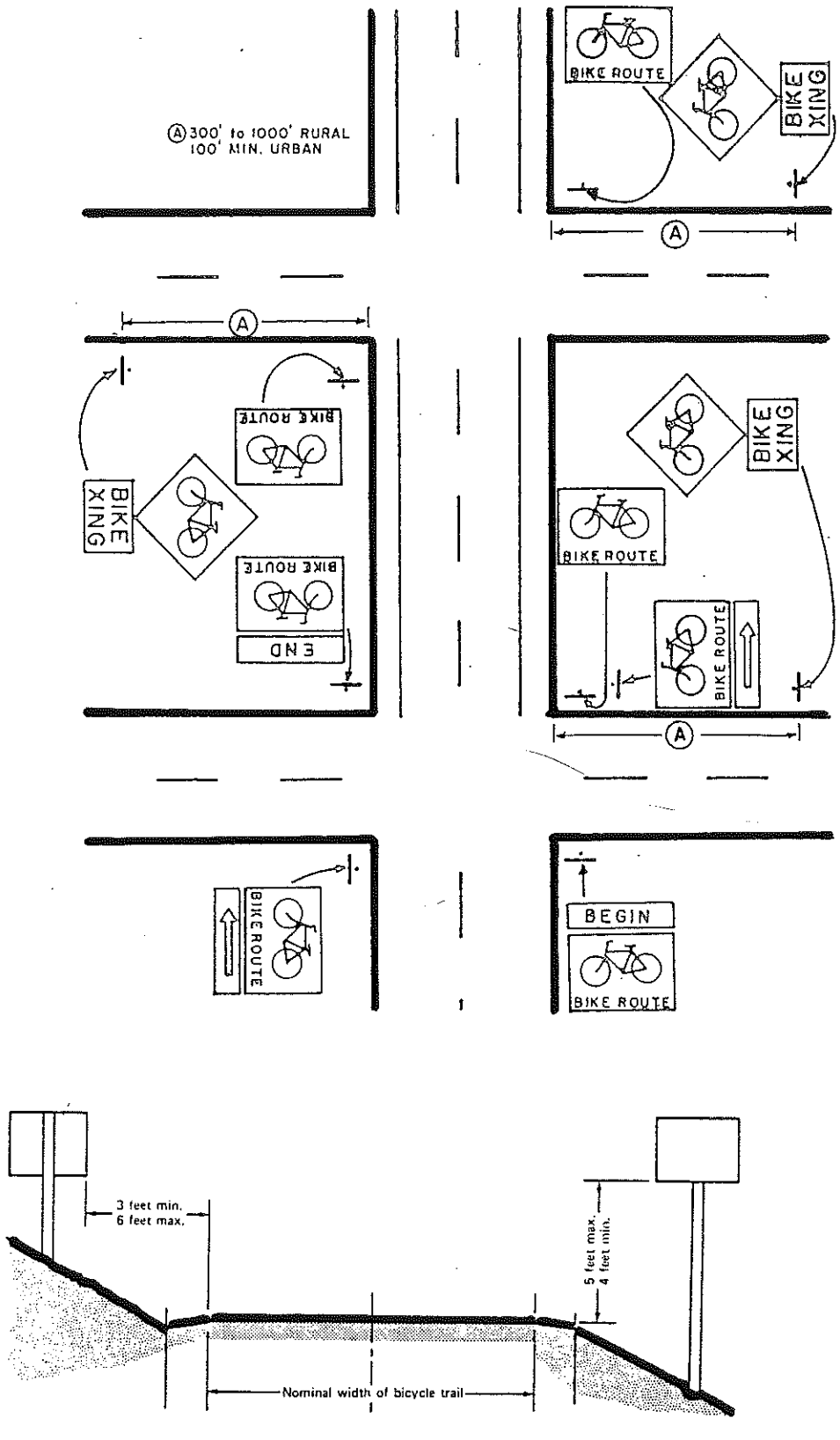


Figure 9-1. Bicycle sign placement on a trail.

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