BICYCLE TRANSPORTATION PLAN
FOR THE
EAU CLAIRE URBANIZED AREA
1995 - 2020

PREPARED BY:

Chippewa-Eau Claire Metropolitan Planning Organization

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EXECUTIVE SUMMARY

The Chippewa-Eau Claire Metropolitan Planning Organization (MPO), in cooperation with the Wisconsin Department of Transportation (WisDOT), the Wisconsin Department of Natural Resources (WisDNR), local municipal representatives and local bicycling advocates, has developed a Bicycle Transportation Plan for the Eau Claire Urbanized Area.

The overall goal of the Bicycle Transportation Plan is to encourage bicycle transportation as an important component of an integrated multi-modal transportation system. To achieve this goal, the Plan: (1) identifies a bikeway system that will provide all bicyclists in the urban area with safe and convenient access to all major centers of employment, education, retail trade, housing and recreation; (2) strives to increase the safety of bicycle transportation through facility improvements and education and law enforcement programs which pertain to the interaction between motorists and bicyclists on public roads; and (3) promotes an increased community awareness of the use of bicycles as a viable alternative mode of transportation.

Bicycling is an important mode of transportation and recreational activity in the Eau Claire Urbanized Area. The local streets of Eau Claire, Chippewa Falls and Altoona, along with rural connecting roads, offer relative safe and unlimited access to area bicyclists. The plan identifies a bikeway system of approximately 191 miles of both on-street and off-street bike facilities to serve the urban area. This bikeway system is comprised of approximately 137 miles of on-street facilities and 54 miles of bike paths. The total cost to provide the necessary improvements to this proposed system is estimated at $9.5 million over the next 25 years.

In addition to the identification of an urban-wide bikeway system, the plan also addresses bicycle safety through education and enforcement programs. This plan's recommendations focus on three distinct aspects for plan implementation. They include: (1) bicycle facilities development and maintenance; (2) support facilities; and (3) bicycle safety education and enforcement programs.

The Bicycle Transportation Plan is intended to serve as a guide to urban municipalities in the development of bike facilities and programs and to identify a referred bikeway system to safely and efficiently serve bicyclists within the metropolitan planning area.
CHAPTER 1: INTRODUCTION

Bicycling is an important mode of transportation and recreational activity in the Eau Claire Urbanized Area. As a smaller metropolitan area, the local streets of Eau Claire, Chippewa Falls and Altoona, along with rural connecting roads, offer relatively safe and unlimited access to area bicyclists. An extensive bikeway system of approximately 42 miles of designated bike routes has been developed in the urban area to further facilitate bicycle transportation. This bikeway system is comprised of approximately 32 miles of shared roadway facilities and 10 miles of bike paths, and is located primarily within the City of Eau Claire. In addition, the Wisconsin Department of Natural Resources (WisDNR) is in the process of completing development of the Chippewa River State Trail, which will extend southwesterly from Eau Claire, linking with the Red Cedar River State Trail and connecting to the City of Menomonie. The WisDNR has also acquired, but not yet developed, abandoned railroad right-of-way extending northeasterly from Chippewa Falls to Cornell. This will become the Old Abe State Trail. The Cities of Eau Claire and Chippewa Falls and the Town of Hallie are pursuing efforts to develop an urban bicycle trail to connect the two designated state trails.

The importance of the bicycle in an integrated multi-modal transportation system has been re-confirmed through the passage of the Intermodal Surface Transportation Efficiency Act (ISTEA). ISTEA places increased importance on the use of the bicycle as a means of transportation and requires the metropolitan transportation planning process to address bicycle transportation facilities. Locally, bicycle facilities have received attention to varying degrees in the Outdoor Recreation Plans prepared by Eau Claire and Chippewa Counties, and in the City of Eau Claire's Waterway Plan, Park and Open Space Plan and Comprehensive Plan. Current planning efforts are also underway by the City of Chippewa Falls and Chippewa County that will address the issue of bicycle transportation as part of an integrated transportation system. The City of Eau Claire, meanwhile, continues to implement the bicycle facility recommendations developed in its comprehensive plan. In 1995, Eau Claire will be constructing an additional two miles of bicycle path along the abandoned Soo Line rail right-of-way paralleling USH 53. This bicycle trail segment will form part of the urban connector to link the Chippewa River and Old Abe State Trails.

Purpose

This Bicycle Transportation Plan is intended to serve as a guide to urban municipalities in the development of bicycle facilities and programs, and to identify a preferred bikeway system to safely and efficiently serve bicycle users within the metropolitan planning area. Its purpose is to provide direction for the continued improvement of the bicycling environment throughout the urban area.
To provide this direction, the plan focuses on the identification of a preferred bikeway system and the development of a locally acceptable facilities improvement strategy. (Appendix A defines the common bicycle facility terms used throughout this plan). The plan provides a range of recommended alternative design treatments, without prescribing specific projects to be undertaken by an implementing jurisdiction. The recommendations provided in this report not only focus on the physical facilities, but also on bicycle education and enforcement as integral components of an overall program to promote safe bicycling. (Appendix B provides a statutory reference for bicycle equipment and use in the state.)
CHAPTER 2: GOAL AND OBJECTIVES

This plan has been developed in consultation and cooperation with representatives of state, county and local municipalities, as well as local bicycling advocates. A Bicycle Facilities Planning Committee was formed to assist the Chippewa-Eau Claire Metropolitan Planning Organization in the planning effort. The recommendations presented in this plan reflect a desire to provide detailed guidance for the enhancement of the bicycling environment while recognizing the fiscal and political constraints under which state and local municipalities operate. To maintain this focus, the plan and recommendations were developed in accordance with the following goal and objectives as a guide.

Goal

The overall goal of the Bicycle Transportation Plan is to encourage bicycle transportation as an important component of an integrated multi-modal transportation system for the Eau Claire Urbanized Area.

Objectives

To help achieve this goal, the following objectives were developed to address the principle concerns of bicycle facilities development and improvement, bicycle safety, and bicycle education and enforcement.

- To identify a bikeway system that will provide all bicyclists in the urban area with safe and convenient access to all major centers of employment, education, retail trade, housing and recreation.

- To increase the safety of bicycle transportation through facility improvements and through education and law enforcement programs pertaining to the interaction between motorists and bicyclists on public thoroughfares.

- To promote an increased community awareness of the use of bicycles as a viable alternative mode of transportation.
CHAPTER 3: PLANNING CRITERIA

Planning criteria for the development of a bicycle transportation system was provided by the Wisconsin Department of Transportation (WisDOT) for consideration in the planning process. The planning criteria was used in the evaluation and selection of bicycle routes and facility types for inclusion in the urban bicycle network. The planning criteria addressed the following transportation-related characteristics considered essential to the development of an effective and safe bicycle network. They include:

1. **Usage.** Bikeways (bike paths, lanes, routes) should be located in areas where use can be maximized. They should provide desirable routes that connect activity centers, such as employment and shopping centers, and educational and recreational facilities, with residential areas. In addition to location, trip length is also considered a major determinant of usage. Most utilitarian bike trips, versus those made for recreational purposes, are less than five miles.

2. **Accessibility/Spacing.** Frequent and convenient bicycle access is important to the effectiveness of a bicycle route. It is desirable for urban residences to be no farther than a quarter to one-half mile from a designated bicycle route. The mobility and accessibility requirements of bicyclists can also be addressed by providing bicycle facilities within urban arterial and collector corridors.

3. **Directness.** For utilitarian bicycle trips, facilities should connect traffic generators and should be located along a direct line convenient for users. Bicyclists, like motorists, prefer a direct route.

4. **Continuity.** A bicycle route system should be free of missing links or gaps. Physical barriers should also be alleviated.

5. **Barriers.** Bicycle facilities should be integrated into the design of street and bridge improvements to eliminate barriers such as freeways, rail lines, rivers and other topographical features such as steep grades.

6. **Aesthetics.** The scenic value of a bicycle route should be considered in the evaluation of alternatives when other criteria are considered of equal weight.

7. **Security.** The physical security of bicyclists and their bicycles from potential criminal acts along remote paths, and the possibility of theft or vandalism at parking locations should be considered.

These factors were considered in both the identification of general corridor locations and the evaluation and siting of preferred bicycle facilities within the identified bicycle corridors.
CHAPTER 4: BICYCLE USAGE

Bicycle usage in the Eau Claire Urbanized Area is difficult to accurately determine. Bicycle traffic counts and trip data are not collected. The only numerical data available with which to access bicycle usage comes from the U.S. Census Bureau and from bicycle registration data obtained from municipal police departments.

According to the 1990 Census, 0.8% of the commuting workforce in the Eau Claire Urbanized Area use a bicycle as their means of transportation to work. Table 1, compares this bicycle use data for Eau Claire to the other urbanized areas in the State, the State of Wisconsin as a whole, and the United States.

Table 1
Bicycle Use as a Means of Transportation to Work
(workers 16 years and over)

<table>
<thead>
<tr>
<th>Wisconsin Urbanized Areas</th>
<th>Wisconsin</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td>EAU CLAIRE</td>
<td>0.8%</td>
<td>0.5%</td>
</tr>
<tr>
<td>Appleton-Neenah</td>
<td>0.7%</td>
<td></td>
</tr>
<tr>
<td>Beloit</td>
<td>0.4%</td>
<td></td>
</tr>
<tr>
<td>Duluth-Superior</td>
<td>0.6%</td>
<td></td>
</tr>
<tr>
<td>Green Bay</td>
<td>0.4%</td>
<td></td>
</tr>
<tr>
<td>Janesville</td>
<td>0.3%</td>
<td></td>
</tr>
<tr>
<td>Kenosha</td>
<td>0.4%</td>
<td></td>
</tr>
<tr>
<td>La Crosse</td>
<td>1.2%</td>
<td></td>
</tr>
<tr>
<td>Madison</td>
<td>2.8%</td>
<td></td>
</tr>
<tr>
<td>Milwaukee</td>
<td>0.3%</td>
<td></td>
</tr>
<tr>
<td>Oshkosh</td>
<td>0.7%</td>
<td></td>
</tr>
<tr>
<td>Racine</td>
<td>0.5%</td>
<td></td>
</tr>
<tr>
<td>Sheboygan</td>
<td>0.9%</td>
<td></td>
</tr>
<tr>
<td>Wausau</td>
<td>0.4%</td>
<td></td>
</tr>
</tbody>
</table>

Source: 1990 U.S. Census, STF 3A (Survey conducted last week of March, 1990. Summer use may be three times higher.)

While the accuracy of this data may be questionable due to the seasonal time period in which it was collected, the relative comparison identifies Eau Claire with the fourth highest percentage of bicycle use for commuting purposes behind Madison, La Crosse and Sheboygan. With an average vehicular commuting time of less than 15 minutes in the Eau Claire Urbanized Area, the use of a bicycle for commuting purposes would appear to be an attractive
alternative to the use of the automobile. In fact, the perception of the study committee members, both bicyclists and non-bicyclists, tends to support a greater amount of bicycle usage than is indicated by the Census statistics.

Bicycle registration data obtained from municipal police departments is another source of information on bicycle availability which can assist in determining usage. However, the voluntary nature of the bicycle registration programs in the urbanized area does not provide an accurate depiction of the number of bicycles owned by urban area residents. Table 2 presents current bicycle registration data obtained from municipal police departments.

Table 2
Bicycle Registration Data

<table>
<thead>
<tr>
<th>Municipality</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eau Claire</td>
<td>1990-93: Approximately 245 bicycles registered per year (2 year registration period).</td>
</tr>
<tr>
<td>Chippewa Falls</td>
<td>1985-1992: 2,484 bicycles registered (one-time registration per bicycle).</td>
</tr>
<tr>
<td>Altoona</td>
<td>1990-1993: 188 bicycles registered (one-time registration per bicycle).</td>
</tr>
</tbody>
</table>

*Source: Eau Claire, Chippewa Falls, Altoona and Town of Hallie Police Departments, 1993*

The municipal bicycle registration programs in the urbanized area are incorporated into bicycle safety programs directed primarily at elementary school children to inform and educate them regarding the safe operation of their bicycles. Promoting bicycle registration is not the main focus of these programs. Without mandatory bicycle registration, the available registration data provides only a limited assessment of the bicycle usage in the urban area.

The bicycle usage information used in the context of this plan to identify bicycle corridors and select preferred routes and design treatments, was supplemented with the observations and experiences of the members of the Bicycle Facilities Planning Committee. It is used in lieu of more detailed bicycle usage data as a representative sample of both rider and system operating characteristics.
CHAPTER 5: BICYCLE TRAVEL CORRIDORS

Bicycle travel corridors within the Eau Claire Urbanized Area are subject to many of the same physical constraints that apply to motor vehicle travel. The hilly topography and meandering waterways restrict travel by motor vehicle, as well as bicycle, to specific corridors and crossing points in many instances. Travel destinations are also similar for both motorists and bicyclists. There exists a strong attraction between trip generators such as schools, universities, commercial areas, and major employers and the residential areas of a community. In the urbanized area, the arterial and collector road system define the travel corridors for both motorists and bicyclists, connecting the trip generators and providing a crossing of physical barriers.

In addition to the urban arterial and collector road network, other natural and manmade corridors exist that provide potential for bicycle travel within the urbanized area. Bicycle paths can minimize conflict points by separating bicyclists from motorists. Bicycle paths along waterways and abandoned railroad right-of-ways provide enjoyable recreational opportunities as well as desirable commuter routes. Bicycle paths can create opportunities not provided by the road system.

The Bicycle Facilities Planning Committee considered the factors described in the planning criteria section of this report in their evaluation and selection of bicycle travel corridors. They were in agreement on using the urban arterial and collector road system, along with riverway and railroad right-of-way corridors, to initially identify bicycle travel corridors in the urban area. This exercise resulted in the identification of the general bicycle travel corridors depicted on Map A: Primary Travel Corridors in the Eau Claire Urbanized Area.
CHAPTER 6: BIKEWAY SYSTEM AND DESIGN TREATMENTS

The evaluation and selection of preferred bicycle routes and facility types is an integrated process that attempts to match routes and facility types with the skill level of the average bicyclist. In order to be effective, the selected bikeway system must be able to accommodate the needs of the largest number of users. Identifying this target group of "average" bicyclists is the first step in the evaluation of route alternatives and the consideration and selection of the appropriate facility type.

Bicycle User

The skill level of bicyclists is classified into two broad categories: Class A and B. Class A bicyclists are generally considered to be more experienced adult riders who are capable of operating under most traffic conditions. Group B bicyclists are casual or novice adult or teenage bicyclists who are less confident in their ability to operate in traffic on collector and arterial streets without special provisions for bicyclists. A subgroup of the Group B bicyclist are the pre-teen riders whose bicycle use is initially monitored by adults, with the majority of their riding occurring on local residential streets with low vehicle speeds and volumes. However, the travel behavior of this subgroup also requires that they have access to key destinations such as schools, recreation facilities and shopping centers.

The Bicycle Facilities Planning Committee agreed that the Class B bicyclist represents the predominant bicycle user in the urbanized area and therefore should be the planning focus in selecting bicycle routes and design treatments. The Committee also agreed that safety should be a primary consideration in route selection and facility improvement to address the basic need of not only the Class B bicyclist, but also the Class A.

Bikeway System

The planning guidelines followed in the development of this plan suggest the most important factors in the evaluation and selection of bicycle routes and bicycle facility types are directness, accessibility, connectivity, safety, cost and usage. These factors were applied in the selection of preferred bicycle routes within the identified bicycle corridors and resulted in a bikeway system in the urbanized area comprised of both on-street and off-street facilities. Map B depicts the recommended bikeway system for the Eau Claire Urbanized Area.

The recommended bikeway system will total approximately 191 miles and consist of approximately 137 miles of on-street bicycle facilities and 54 miles of
bike paths. The on-street facilities will comprise 72% of the system, while the bike paths/trails will make up 28% of the bikeway system.

The recommended bikeway system will utilize approximately 142 miles of existing roadways (132 miles) and bike paths (10 miles). Approximately six miles of new roadway are proposed for inclusion in the bikeway system while 44 miles of new bike paths are proposed for the system. Map B identifies the existing and proposed facilities recommended in this Bicycle Transportation Plan. It is important to note that while all of the identified existing system is accessible to bicyclists, improvements will be required on a large part of the system to comply with AASHTO and WisDOT recommended design standards for bicycle facilities. The needs of bicyclists should be considered when any major street is initially designed or redesigned.

Of the 137 miles of recommended on-street bikeway system, 63 miles (46%) are proposed on roads functionally classified as local roads. The lower traffic volumes on these roads mean that they can, for the most part, serve as shared roadway facilities for bicycle use and require no major improvements. The remaining 74 miles (54%) of recommended on-street bicycle facilities are located on higher traffic volume collector and arterial streets and will most likely require some improvements to provide a wide curb lane or designated bike lane facility to increase bicycling safety. This leads to the necessity to incorporate appropriate design standards to ensure that all bicycle facilities are developed uniformly to enhance and encourage safe bicycle travel.

Design Treatments

The selection of preferred bicycle routes to form an urban bikeway system was determined by examining local conditions. Recognizing that conditions change over time, it is important to understand that the bicycle routes are also subject to modification as circumstances warrant. For this reason, the Bicycle Facilities Planning Committee elected to recommend design treatments applicable to facility types, rather than prescribing specific projects. This allows the implementing municipalities the flexibility to develop that portion of the bikeway system within their jurisdiction in a manner that is acceptable to them while maintaining consistent design standards throughout the urban bikeway system. Under this scenario, a municipality may choose to select a parallel side street requiring less improvement, or the development of an adjoining bicycle path, in place of more costly improvements that may require more extensive construction and/or right-of-way acquisition. This systems level approach is also in keeping with the intent of the plan to serve as a bicycle facilities development guide, encouraging the use of "best practices", not as an urban-wide capital improvements program. Communities are encouraged to follow the
recommendations of the bikeway map wherever possible, realizing that exceptions will have to be made.

The primary consideration in selecting the appropriate facility treatment for a segment of a designated bikeway system is the local traffic conditions. Figure 1 depicts the relative suitability of streets for bicycling based on traffic volume and motor vehicle speed. Traffic volume and motor vehicle speed serve as threshold limits in determining the appropriate facility design treatment. The guidance provided by WisDOT for bicycle facility planning purposes is contained in Appendix C in the back of this report and provides a detailed description of the bicycle facility types incorporated in this plan.

**Figure 1**
**Guidelines for Determining Relative Suitability of Streets for Bicycling**
(Based on Motor Vehicle Speed & Volume Conditions for Urban Areas*)

*The suitability of the street will also vary with the time of day, pavement width, parking and other traffic conditions as additional considerations.

*Source: Bicycle Transportation Plan for Madison and Dane County, Dane County RPC, 1991.*
This Bicycle Transportation Plan incorporates the traffic condition factor as a principle determinant for the type of facility treatment recommended for the various on-street segments of the urban bikeway system. The following design treatments are recommended to be incorporated into the development of the following types of bicycle facilities.

- **Shared Roadway.** Local roads with low traffic volumes (2,000 vehicles per day or less) can be safely shared by bicyclists and motorists with no additional improvements necessary.

- **Paved Shoulders.** Rural arterial and collector highways should have paved shoulders to a minimum width of four feet to accommodate bicycle travel.

- **Wide Curb Lanes.** Urban arterials and collectors with 10,000 vehicles per day or less, and a posted speed limit of less than 45 mph, should have, as a minimum, a 15 foot wide curb lane. (A five foot marked bike lane may be provided under the same conditions to increase safety where feasible.) Where parking is currently permitted along a designated bicycle facility which warrants a wide curb lane, the shared use of the parking lane can accommodate bicyclists, providing that the parked vehicles do not occupy more than 40% of the permitted parking space within a given block.

- **Bike Lanes.** Urban arterials with more than 10,000 vehicles per day, and where the posted speed limit is 45 mph or less, should have a five foot marked bike lane. Where the posted speed limit exceeds 45 mph, a six foot marked bike lane should be provided.

- **Bike Path.** A bike path should be physically separated from motor vehicle traffic by an open space or barrier, and may be within the roadway right-of-way or within an open space. Bike paths should be constructed with a ten foot wide paved surface and a two foot clear zone on each side to accommodate two-way bicycle travel. Structures such as bridges, overpasses and underpasses should be constructed 12 foot wide where feasible.

Cost estimates for the various facility treatments are difficult to determine accurately due to the many variables which may affect a specific project cost. However, general improvement costs can be identified within a set of given parameters. The following cost estimates have been developed for the identified bicycle facility treatments described above.
• **Shared Roadway.** No additional improvements necessary for use by bicyclists. However, there is a need to maintain a smooth road surface free from dirt and debris, which may require more frequent maintenance.

• **Paved Shoulders.** Paving an additional four feet of shoulder with three inches of bituminous at the time of road reconstruction will cost approximately $20,000 per mile for both sides of the roadway. (This cost estimate assumes no design or base work.)

• **Wide Curb Lanes/Bike Lanes.** Paving costs to accommodate either a wide curb lane or a designated bike lane at the time of road reconstruction are estimated at $70,000 per mile for an additional three feet of concrete on both sides of the road and $35,000 per mile for an additional four feet of bituminous on both sides. The cost of striping for a bike lane adds another $5,000 per mile. (These cost estimates assume no additional right-of-way or utility relocation costs.) The removal of on-street parking or shift in lane markings, may alleviate the need for roadway expansion.

• **Bike Path.** Construction cost estimates for rural bicycle paths vary considerably from $35,000 per mile for a crushed limestone surface on an abandoned railroad right-of-way to $100,000 per mile for a bituminous paved surface meeting AASHTO standards on new alignment. Urban bike paths constructed with federal funding assistance can range from between $150,000 and $175,000 per mile to $300,000 per mile, depending upon the location and the extent of the improvements required. Several of the major factors that can impact on the overall cost include: right-of-way acquisition, drainage improvements, the number of intersections and structures such as bridges, overpasses and underpasses.

The bicycle facility improvements costs for the specified design treatments can then be applied to the identified system mileage to develop a total cost estimate for the proposed facility improvements recommended in this plan. This cost estimating methodology is presented in Table 3.

To expand on the recommendations regarding bicycle facilities and design treatments listed in Table 3, there are additional detailed references to consult for "best practices" for facility design. The WisDOT Facilities Development Manual for Bicycle Facilities, published in February of 1994, is one such reference included as Appendix D. The WisDOT manual incorporates the procedures prescribed in the AASHTO "Guide for the Development of Bicycle Facilities", published in August of 1991.

In addition to some of the more expensive improvements associated with the construction of new facilities or the upgrading of existing facilities, there are other inexpensive improvements that can be made to enhance the bicycling
environment in the urban area. Such actions as installing bicycle-safe storm drainage grates and rubberized railroad crossings, along with maintaining roadway edges and patching where needed, can benefit motor vehicles and pedestrians, as well as bicyclists. More detailed information on these and other low cost bicycle facility improvements can be found in Appendix E: Improving Local Conditions for Bicycling, a Bicycle Forum publication.

### Table 3
Bikeway System Cost Estimates

<table>
<thead>
<tr>
<th>Bikeway System Mileage</th>
<th>Description</th>
<th>Recommended Facility Type</th>
<th>Estimated Improvement Cost Per Mile</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>63 miles</td>
<td>Low Volume Local Roads</td>
<td>Shared Roadway</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>47 miles</td>
<td>Arterial/Collector-Urban Section</td>
<td>Wide Curb Lane/Bike Lane</td>
<td>$50,000</td>
<td>$2.35 million</td>
</tr>
<tr>
<td>27 miles</td>
<td>Arterial/Collector-Rural Section</td>
<td>Paved Shoulder</td>
<td>$20,000</td>
<td>$0.55 million</td>
</tr>
<tr>
<td>10 miles</td>
<td>Existing Off-Road Trails</td>
<td>Maintain</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>44 miles</td>
<td>New Off-Road Trails</td>
<td>Bike Path</td>
<td>$150,000</td>
<td>$6.60 million</td>
</tr>
<tr>
<td>191 miles</td>
<td></td>
<td></td>
<td></td>
<td>$9.50 million</td>
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### Supporting Facilities

Providing supporting facilities is essential to the success of an overall effort to promote bicycling. Bicycle parking facilities, in particular, should be provided at trip origins, trip destinations and mode transfer points, and should offer protection from theft and damage. Bicycle parking facilities can range from bicycle racks to enclosed bicycle lockers. They should be available at the same locations currently available for motor vehicle parking and should address user needs for both short-term and long-term parking. Short-term parking should be available at locations such as shopping centers, libraries, recreation areas and post offices. Long-term parking facilities should be available at locations such as employment centers, transit stations and multi-family dwellings. Bicycle racks can accommodate short-term parking requirements, however, bicycle lockers and/or attended storage facilities may be preferred for long-term parking needs. The location of bicycle parking facilities should also ensure that bicycles will not be damaged by motor vehicles or disturbed by other parked bicycles. Parking facilities should also not interfere with normal pedestrian flow. Bicycle parking
facilities should be placed as near building entrances as possible and in high visibility areas for security and maximum use. Also, all bicycle racks should be capable of accepting U-shaped locks to secure the frame of the bicycle.

In addition to bicycle parking facilities, there are several other improvements that can complement a bikeway system. For example, turnouts or rest areas may be provided on long, uninterrupted bicycle paths to increase the safety of users. Provisions may also be considered for interfacing bicycle travel with public transit, such as bicycle racks on buses. Printing and distributing bikeway system maps is a high benefit, low cost project that can be implemented. Maps can help bicyclists locate bikeways, parking facilities, and identify the relative suitability of different segments of the road system. Maps can also help bicyclists avoid problem areas, such as narrow, high speed or high volume roads, one-way streets and barriers. In addition, maps can provide general information on "Rules of the Road", bicycle safety tips and interfacing with public transit.
CHAPTER 7: BICYCLE SAFETY

Nationally, an estimated 1,000 people die in bicyclist/motor vehicle crashes each year. In Wisconsin, 12 to 13 bicyclists die each year as a result of crashes with motor vehicles, and approximately 1,700 bicyclists are injured in motor vehicle/bicyclist crashes.

A study performed by North Carolina's Highway Safety Research Center in 1988 revealed that bicycle crashes captured by police crash report forms account for only 10% of all bicycle injury crashes. Thus, official numbers are likely to drastically under-report the bicycle safety problem.

Information obtained from Wisconsin crash reports in 1992 indicates that individuals age 6 to 18 years account for 62% of all reported bicycle crashes and males are involved in 74% of all crashes. The Consumer Product Safety Commission has further determined that three out of every four bicycle crash fatalities result from head injuries, presenting a strong argument for the use of helmets by bicycle riders.

Similar to bicycle usage data, detailed information on bicycle crashes and bicycle helmet use is not readily available for the Eau Claire Urbanized Area. Available bicycle crash data, as reported by municipal police departments, is presented in Table 4.

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<tr>
<td>Eau Claire</td>
<td>26</td>
<td>33</td>
<td>36</td>
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<tr>
<td>Chippewa Falls</td>
<td>10</td>
<td>6</td>
<td>7</td>
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<tr>
<td>Altoona</td>
<td>1989-1993: 4 bicycle crashes reported</td>
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<tr>
<td>Town of Hallie</td>
<td>1989-1993: 1 bicycle crash reported</td>
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Source: Eau Claire, Chippewa Falls, Altoona and Town of Hallie Police Departments, 1993

As indicated by the number of bicycle crashes reported by local police departments, the number of reported incidences is relatively low. Further analysis revealed a wide range of types of crashes with no single location identified as a problem area by exhibiting a higher frequency of bicycle crashes. One area of exception is notable. The nine block area of Water Street in Eau Claire serves the lower portion of the University of Wisconsin-Eau Claire campus and extends through a high traffic volume commercial and residential area. This
general area produces an overall higher incidence of bicycle crashes due to the increased exposure to bicycle/pedestrian/motor vehicle conflicts.

Bicycle safety programs have been incorporated within the operations of the police departments for the Cities of Eau Claire, Chippewa Falls and Altoona, and the Town of Hallie. However, with the assistance of a National Highway Traffic Safety grant, only Eau Claire has been able to maintain a full-time bicycle/pedestrian safety coordinator and develop a more extensive bicycle/pedestrian safety program. This special funding has enabled the City of Eau Claire to conduct a more intensive monitoring effort and design and direct bicycle education and enforcement efforts at specific target groups to improve bicycle safety. Examples of the increased level of effort can be found in the Eau Claire Police Department's Street Safe report, published in December of 1992. Statistical excerpts from this report, along with a summary of the bicycle safety program in the city, prepared by the bicycle safety coordinator, are contained in Appendix F. Much of the crash data collected and analyzed under this program parallels national and state statistical trends.

While the development of bicycle facilities is one way to enhance bicyclists' safety, clearly there are some bicycle crashes that can only be countermeasured through education and enforcement. A study of bicyclist/motor vehicle crashes conducted by Ken Cross and Gary Fisher in 1976 found that some of the recurring events that account for the majority of bicycle crashes include the following:

- Mid-block or stop sign rideout by bicyclist.
- Bicyclist makes an unexpected left turn.
- Motorist stops and goes.
- Motorist makes a left or right turn in front of a bicyclist.
- Wrong way riding by bicyclist.

Further information obtained from this study indicated that children are involved in two-thirds of the incidents. More detailed statistical information addressing the types of motorist/bicyclist crashes obtained from the Cross-Fisher study is presented in Appendix G. Not surprisingly, the bicycle/motor vehicle crash data compiled by the City of Eau Claire provided a similar perspective on the characteristics of such incidents. The most common type of reported bicycle/motor vehicle crash in Eau Claire is failure on the part of the bicyclist to stop at a stop sign or traffic signal. Also in Eau Claire, children between the ages of 10 and 14 are involved in more reported bicycle crashes than any other age group. These correlating statistics would indicate a direct relationship between national bicycle safety issues and those identified in the City of Eau Claire.
Through the City of Eau Claire's intensified data collection and analysis efforts, the city has developed a safety education and enforcement program directed at the higher risk target groups. The city's bicycle safety program includes school presentations, bike clinics, a summer bike patrol, bicycle helmet promotion, and special promotional efforts conducted in cooperation with the university for bike safety. With the exception of the summer bike patrol and university bike safety program which are only conducted in Eau Claire, Chippewa Falls, Altoona and the Town of Hallie conduct similar bicycle education programs through their police departments. With limited resources, bicycle safety programs in the urbanized area have been targeted, primarily through educational efforts, at the largest at-risk group -- elementary school students. A more comprehensive education and enforcement program targeted at adult bicyclists and motor vehicle operators to encourage adherence to the "Rules of the Road" could certainly enhance the bicycling environment in the urbanized area. However, to be effective, an expanded bicycle safety program of this nature should be conducted on an urban-wide basis. The varying levels of perceived need, as well as local cost constraints, present difficult obstacles to implementing a more comprehensive bicycle safety program in the urban area. This represents an area of public education that perhaps can be addressed through a more active involvement by other public institutions and private organizations.
CHAPTER 8: RECOMMENDATIONS FOR PLAN IMPLEMENTATION

Funding

The key to the successful implementation of this Bicycle Transportation Plan is a commitment to funding the necessary improvements. Therefore, prior to presenting the recommendations for the implementation of this plan, it is necessary to first address the funding mechanisms to support the improvements.

There are a variety of federal, state, local and private funding sources for pedestrian and bicycling projects. At the federal level, ISTEA funding sources for these projects include:

- National Highway System (NHS) Funds (Section 1006) may be used to construct bicycle transportation facilities and pedestrian walkways on land adjacent to any highway on the National Highway System (other than the Interstate System).

- Surface Transportation Program (STP) Funds (Section 1007) may be used for either the construction of bicycle transportation facilities and pedestrian walkways, or nonconstruction projects (such as brochures, public service announcements and route maps) related to safe bicycle use. Ten percent of STP funds are used for "Transportation Enhancements" which include the provision of facilities for bicyclists and pedestrians.

- Congestion Mitigation and Air Quality Improvement (CMAQ) Program Funds (Section 1008) may be used for either the construction of bicycle transportation and pedestrian walkways, or nonconstruction projects (such as brochures, public service announcements and route maps) related to safe bicycle use.

- Federal Lands Highway Funds (Section 1032) may be used to construct pedestrian walkways and bicycle transportation facilities in conjunction with roads, highways and parkways at the discretion of the department charged with the administration of such funds.

- Scenic Byways Program Funds (Section 1047) may be used to construct facilities along scenic highways for the use of pedestrians and bicyclists.

- Section 402 Funding. Pedestrian and bicyclist safety remain priority areas for highway safety program funding. Title II, Section 2002, of the ISTEA addresses state and community highway safety grant program funds. The priority status of safety programs for pedestrians and bicyclists expedites the approval process for these safety efforts.
• Federal Transit Funding, Title III, Section 25 of ISTEA, continues to allow transit funds to be used for bicycle and pedestrian access to transit facilities, to provide shelters and parking facilities for bicycles in or around transit facilities, or to install racks or other equipment for transporting bicycles on transit vehicles.

Incorporating ISTEA funds at the state level, the Wisconsin Department of Transportation has developed a Statewide Multi-Modal Improvement Program (SMIP) that simplifies the application procedure for three separate funding programs that can be used in support of bicycle and pedestrian facilities. They include:

• Statewide Transportation Enhancements Program (STEP) provides funding for 10 eligible project categories, including bicycle and pedestrian facilities, that enhance a transportation project or an area served by a project. The enhancement projects must accomplish something "above and beyond" what has normally been done on a highway project.

• Bicycle and Pedestrian Facilities Program (BPFP) provides funding specifically for bicycle and pedestrian planning and small scale facility development for projects that are part of a bicycle and pedestrian plan.

• Surface Transportation Discretionary Program (STP-D) targets funding for urban areas of 5,000 population or more, and focuses on surface transportation projects that promote non-highway use or that otherwise supplement existing transportation activities.

Other state level funding programs that focus on the recreational aspect of trail development, but can also promote bicycle and pedestrian use, are administered by the Wisconsin Department of Natural Resources. If applied with mutually compatible objectives, WisDNR trail funding programs can achieve the same end result in providing for the development of recreational trails that also serve the needs of bicyclists and pedestrians. Some of these programs include:

• The Stewardship Program provides $1 million annually to plan and develop new trails and maintain existing ones. The goal is to enhance the statewide system of trails and link existing trails where possible.

• The Land and Water Conservation Fund (LAWCON) provides matching grant funding for the acquisition of land for public outdoor recreational areas and preservation of water frontage and open space, and the development of public outdoor park and recreational areas and their support facilities.
• The National Recreational Trails Act (NRTA) provides funds for the acquisition, maintenance, rehabilitation and development of both motorized and non-motorized, and diversified trails.

• The Snowmobile Aids Program provides funding assistance for the development and maintenance of a statewide system of snowmobile trails with a projected $2.9 million budget for fiscal year 1994-95. Seasonal use of these facilities provide additional opportunities for bicyclists and pedestrians.

Locally, bicycle and pedestrian projects must compete with other municipal priorities for funding from general tax revenue. A community's capital improvements program identifies a municipality’s priority projects and designates those projects for funding during the development of the annual municipal budgets. Securing outside matching funds can often times elevate the priority status of a particular project. In addition to federal and state funding assistance, urban area municipalities can pursue private sources to aid in the implementation of their bicycle facilities and programs. Corporations may offer assistance in funding bicycle safety programs as well as for printing various maps and documents to supplement the development of bicycle facilities. Civic groups such as "Friends of the Trail" may also offer assistance in fund raising for trail improvements.

Above all, a coordinated approach to funding the recommendations contained in this Bicycle Transportation Plan is essential to achieving the objectives established for the development of this plan. The development of an urban-wide bikeway system with support facilities and complementary safety education and enforcement programs cuts across many boundaries, jurisdictionally, as well as programmatically. Only through the development of partnerships and the cooperative and creative use of available funding sources can the implementation of this plan be realized.

Recommendations

The recommendations contained in this Bicycle Transportation Plan address three distinct aspects of plan implementation. They include: (1) facilities development and maintenance; (2) supporting facilities; and (3) safety education and enforcement programs. The recommendations are intended to provide guidance at the system-wide planning level, leaving the project selection and the staging of improvements to the municipalities with the responsibility for their implementation.
Bicycle Facilities Development and Maintenance

- The needs of bicyclists should be considered in the initial planning of all roadway and bridge projects, including the provision of adequate project funding to accommodate the identified needs.

- The provision of bicycle facilities should be incorporated into the land use planning process of local jurisdictions and reflected in local zoning ordinances, subdivision regulations, site plan reviews and building permit requirements.

- All new roadway construction should consider providing sufficient paved surface width to accommodate bicyclists where needed (refer to Appendices C and D for guidelines).

- When roadways are resurfaced or reconstructed, consideration should be given to improving the surface condition and width of the outside (curb) lane to safely accommodate bicyclists.

- As existing bicycle facilities are resurfaced, repaired or reconstructed, they should be brought into compliance with the AASHTO standards for bicycle facilities whenever possible.

- The location of future bikeways should consider abandoned rail corridors, utility corridors, parks, greenways and other public access lands.

- Bicycle route signs should only be used to designate facilities that provide continuity to other bicycle facilities, are preferred routes through high demand corridors and comply with the AASHTO standards for bicycle facilities.

- Bicycle-safe railroad crossings, drainage grates and utility covers should be provided on all roadways.

- Traffic signals using induction loop detectors should consider bicycle sensitive loop detectors.

- Roadside obstructions, such as beam guard rails, sign posts and utility poles, should be set back at least two feet from the pavement whenever possible.

- Chippewa and Eau Claire Counties should continue their programs of paving shoulders on county trunk highways serving as bicycle routes
with a recommended minimum paved shoulder width of four feet whenever possible.

- The Wisconsin Department of Natural Resources should be encouraged to designate and assist in the development of urban trail linkages between the Chippewa River and Old Abe State Bicycle Trails.

- Bicycle lane striping and the sweeping and cleaning of designated on-street bike routes should be included in the regular maintenance schedule of local street maintenance agencies.

- The full width of bicycle paths should be maintained to prevent deterioration of pavement edges.

- Bicycle paths should be swept regularly to maintain safe riding conditions.

- Tree and shrub trimming should provide a minimum of eight foot vertical clearance and two feet horizontal clearance along both sides of a bike path.

**Bicycle Support Facilities**

- Bicycle parking facilities should be available at all locations offering parking for motor vehicles.

- Bicycle parking facilities should be located as near building entrances as possible and in high visibility areas for security and maximum use.

- Bicycle parking devices should be designed to avoid causing damage to bicycles and to accommodate all types of lock sets, including U-shaped locks.

- Employers and businesses should be encouraged to provide conveniently located, safe and weather protected bicycle parking for employees and customers whenever possible.

- Consideration should be given to providing bicycle racks on buses for interfacing bicycle travel with public transit.

- Bicycle facilities in high traffic corridors, as well as underpasses, tunnels and intersections, should be well lighted.
Bicycle Safety Education and Enforcement Programs

- The Cities of Eau Claire, Chippewa Falls and Altoona should maintain their Pedestrian/Bicycle Safety Coordinator positions and strive to expand their bicycle safety programs to address the safety issues involving the novice or casual adult bicyclist.

- Bicycling safety information should be included in driver’s education and defensive driving programs.

- The local school systems, colleges and University of Wisconsin-Eau Claire should be encouraged to include effective and safe bicycle training courses in their regular course curricula.

- Local bicycling organizations should continue to educate their membership and the general public on safe bicycling techniques and bicyclists’ rights and responsibilities.

- Urban area jurisdictions and local organizations should work cooperatively to make available bicycling resource guides and bikeway system maps for the urbanized area.

- The City of Eau Claire should continue the pedestrian/bicycle safety monitor program and other jurisdictions should consider developing monitor programs with coordinated training and procedures between programs.

- All local law enforcement officers should receive training in the enforcement of laws concerning bicyclists’ rights and responsibilities through recruit training and in-service refresher courses.

- Local jurisdictions with bicycle registration programs should examine the potential for upgrading the programs to increase compliance, and increase the benefits of the programs for bicyclists and local jurisdictions.
Appendix A

Bicycle Facility Terms
BICYCLE - A vehicle having two tandem wheels, either of which is more than 16" in diameter or having three wheels in contact with the ground any of which is more than 16" in diameter, propelled solely by human power, upon which any person or persons may ride. Source: AASHTO Bicycle Guidelines.

BICYCLE FACILITIES - A general term denoting improvements and provisions made by public agencies to accommodate or encourage bicycling, including parking facilities, mapping all bikeways, and shared roadways not specifically designated for bicycle use. Source: AASHTO Bicycle Guidelines.

BICYCLE LANE - A portion of a roadway which has been designated by striping, signing and pavement markings for the preferential or exclusive use of bicyclists. Source: AASHTO Bicycle Guidelines.

BICYCLE PATH - A bikeway physically separated from motorized vehicular traffic by an open space or barrier and either within the highway right of way or within an independent right of way.

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. Source: AASHTO Bicycle Guidelines.

BIKEWAY - Any road, path, or way which in some manner is specifically designated for the exclusive use of bicycles or are to be shared with other transportation modes. Source: AASHTO Bicycle Guidelines.

HIGHWAY - A general term denoting a public way for purposes of travel, including the area within the right of way. Used primarily in reference to public ways in rural settings.

ROADWAY - The portion of the highway or street, including shoulders, typically used for vehicle use. Source: AASHTO Bicycle Guidelines.

SHARED ROADWAY - Any roadway upon which a bicycle lane is not designated and which may be legally used by bicycles regardless of whether such facility is specifically designated as a bikeway. Source: AASHTO Bicycle Guidelines.

SIDEWALK - The portion of a highway or street designed for preferential or exclusive use by pedestrians. Source: AASHTO Bicycle Guidelines.

STREET - A general term denoting a public way for purposes of travel in an urban setting.
Appendix B

Wisconsin Statutes on Bicycle Equipment and Use
85.07 Highway safety coordination.

(4) BICYCLE RULES. The department shall publish literature setting forth the state rules governing bicycles and their operation and shall distribute and make such literature available without charge to local enforcement agencies, safety organizations, and schools and to any other person upon request.

340.01 Words and phrases defined. In s. 23.33 and chs. 340 to 349 and 351, the following words and phrases have the designated meanings unless a different meaning is expressly provided or the context clearly indicates a different meaning:

(5) “Bicycle” means every device propelled by the feet acting upon pedals and having wheels any 2 of which are not less than 14 inches in diameter.

(5e) “Bicycle lane” means that portion of a roadway set aside by the governing body of any city, town, village or county for the exclusive use of bicycles or other modes of travel where permitted under s. 349.23 (2) (a), and so designated by appropriate signs and markings.

(5m) “Bike route” means any bicycle lane, bicycle way or highway which has been duly designated by the governing body of any city, town, village or county and which is identified by appropriate signs and markings.

(5s) “Bicycle way” means any path or sidewalk or portion thereof designated for the use of bicycles by the governing body of any city, town, village or county.

(74) “Vehicle” means every device in, upon or by which any person or property is or may be transported or drawn upon a highway, except railroad trains. A snowmobile shall not be considered a vehicle except for purposes made specifically applicable by statute.

346.02 Applicability of chapter.

(4) APPLICABILITY TO PERSONS RIDING BICYCLES AND MOTOR BICYCLES. (a) Subject to the special provisions applicable to bicycles, every person riding a bicycle upon a roadway is granted all the rights and is subject to all the duties which this chapter grants or applies to the operator of a vehicle, except those provisions which by their express terms apply only to motor vehicles or which by their very nature would have no application to bicycles. For purposes of this chapter, provisions which apply to bicycles also apply to motor bicycles, except as otherwise expressly provided.

(b) Provisions which apply to the operation of bicycles in crosswalks under ss. 346.23, 346.24, 346.37 (1) (a) 2, (c) 2 and (d) 2 and 346.38 do not apply to motor bicycles.

346.075 Overtaking and passing bicycles and motor buses. (1) The operator of a motor vehicle overtaking a bicycle proceeding in the same direction shall exercise due care, leaving a safe distance, but in no case less than 3 feet clearance when passing the bicycle and shall maintain clearance until safely past the overtaken bicycle.

346.16 Use of controlled-access highways, expressways and freeways. (1) No person shall drive a vehicle onto or from a controlled-access highway, expressway or freeway except through an opening provided for that purpose.

(2) (a) Except as provided in par. (b), no pedestrian or person riding a bicycle or other nonmotorized vehicle and no person operating a moped or motor bicycle may go upon any expressway or freeway when official signs have been erected prohibiting such person from using the expressway or freeway.

(b) A pedestrian or other person under par. (a) may go upon a portion of a hiking trail, cross-country ski trail, bridle trail or bicycle trail incorporated into the highway right-of-way and crossing the highway if the portion of the trail is constructed under s. 84.06 (11).

346.17 Penalty for violating sections 346.04 to 346.16.

(2) Any person violating ss. 346.05, 346.07 (2) or (3), 346.08 to 346.11, 346.13 (2) or 346.14 to 346.16 may be required to forfeit not less than $30 nor more than $300.

(4) Any person violating s. 346.075 may be required to forfeit not less than $25 nor more than $200 for the first offense and not less than $50 nor more than $500 for the second or subsequent violation within 4 years.

346.23 Crossing controlled intersection or crosswalk. (1) At an intersection or crosswalk where traffic is controlled by traffic control signals or by a traffic officer, the operator of a vehicle shall yield the right-of-way to a pedestrian, or to a person who is riding a bicycle in a manner which is consistent with the safe use of the crosswalk by pedestrians, who has started to cross the highway on a green or “Walk” signal and in all other cases pedestrians and bicyclists shall yield the right-of-way to vehicles lawfully proceeding directly ahead on a green signal. No operator of a vehicle proceeding ahead on a green signal may begin a turn at a controlled intersection or crosswalk when a pedestrian or bicyclist crossing in the crosswalk on a green or “Walk” signal would be endangered or interfered with in any way. The rules stated in this subsection are modified at intersections or crosswalks on divided highways or highways provided with safety zones in the manner and to the extent stated in sub. (2).

(2) At intersections or crosswalks on divided highways or highways provided with safety zones where traffic is controlled by traffic control signals or by a traffic officer, the operator of a vehicle shall yield the right-of-way to a pedestrian or bicyclist who has started to cross the roadway either from the near curb or shoulder or from the center dividing strip or a safety zone with the green or “Walk” signal in the pedestrian’s or bicyclist’s favor.

346.24 Crossing at uncontrolled intersection or crosswalk. (1) At an intersection or crosswalk where traffic is not controlled by traffic control signals or by a traffic officer, the operator of a vehicle shall yield the right-of-way to a pedestrian or bicyclist in a manner which is consistent with the safe use of the crosswalk by pedestrians, who is crossing the highway within a marked or unmarked crosswalk.

(2) No pedestrian or bicyclist shall suddenly leave a curb or other place of safety and walk, run or ride into the path of a vehicle which is so close that it is difficult for the operator of the vehicle to yield.

(3) Whenever any vehicle is stopped at an intersection or crosswalk to permit a pedestrian or bicyclist to cross the roadway, the operator of any other vehicle approaching from the rear shall not overtake and pass the stopped vehicle.
346.25 Crossing at place other than crosswalk. Every pedestrian or bicyclist crossing a roadway at any point other than within a marked or unmarked crosswalk shall yield the right-of-way to all vehicles upon the roadway.

346.30 Penalty for violating sections 346.23 to 346.29. (1) 2. Any operator of a bicycle violating s. 346.23, 346.24 or 346.25 may be required to forfeit not more than $20.

346.34 Turning movements and required signals on turning and stopping. (1) TURNING. (a) No person may:
   1. Turn a vehicle at an intersection unless the vehicle is in proper position upon the roadway as required in s. 346.31.
   2. Turn a vehicle to enter a private road or driveway unless the vehicle is in proper position on the roadway as required in s. 346.32.
   3. Turn a vehicle from a direct course or move right or left upon a roadway unless and until such movement can be made with reasonable safety.
   (b) In the event any other traffic may be affected by such movement, no person may turn any vehicle without giving an appropriate signal in the manner provided in s. 346.35. When given by the operator of a vehicle other than a bicycle, such signal shall be given continuously during not less than the last 100 feet traveled by the vehicle before turning. The operator of a bicycle shall give such signal continuously during not less than the last 50 feet traveled before turning.
   (2) STOPPING. No person may stop or suddenly decrease the speed of a vehicle without first giving an appropriate signal in the manner provided in s. 346.35 to the operator of any vehicle immediately to the rear when there is opportunity to give such signal. This subsection does not apply to the operator of a bicycle approaching an official stop sign or traffic control signal.

346.35 Method of giving signals on turning and stopping. Whenever a stop or turn signal is required by s. 346.34, such signal may in any event be given by a signal lamp or lamps of a type meeting the specifications set forth in s. 347.15. Except as provided in s. 347.15 (3m), such signals also may be given by the hand and arm in lieu of or in addition to signals by signal lamp. When given by hand and arm, such signals shall be given from the left side of the vehicle in the following manner and shall indicate as follows:
   (1) Left turn — Hand and arm extended horizontally.
   (2) Right turn — Hand and arm extended upward.
   (3) Stop or decrease speed — Hand and arm extended downward.

346.36 Penalty for violating sections 346.31 to 346.35. (2) Any operator of a bicycle violating ss. 346.31 to 346.35 may be required to forfeit not more than $20.

346.37 Traffic-control signal legend. (1) Whenever traffic is controlled by traffic control signals exhibiting different colored lights successively, or with arrows, the following colors shall be used and shall indicate and apply to operators of vehicles and pedestrians as follows:
   (a) Green. 1. Vehicular traffic facing a green signal may proceed straight through or turn right or left unless a sign at such place prohibits either such turn, but vehicular traffic shall yield the right of way to other vehicles and to pedestrians lawfully within the intersection or an adjacent crosswalk at the time such signal is exhibited.
   2. Pedestrians, and persons who are riding bicycles in a manner which is consistent with the safe use of the crosswalk by pedestrians, facing the signal may proceed across the roadway within any marked or unmarked crosswalk.

(b) Yellow. When shown with or following the green, traffic facing a yellow signal shall stop before entering the intersection unless so close to it that a stop may not be made in safety.
(c) Red. 1. Vehicular traffic facing a red signal shall stop before entering the crosswalk on the near side of an intersection, or if none, then before entering the intersection or at such other point as may be indicated by a clearly visible sign or marking and shall remain standing until green or other signal permitting movement is shown.
   2. No pedestrian or bicyclist facing such signal shall enter the roadway unless he or she can do so safely and without interfering with any vehicular traffic.
   3. Vehicular traffic facing a red signal at an intersection may, after stopping as required under subd. 1, cautiously enter the intersection to make a right turn into the nearest lawfully available lane for traffic moving to the right or to turn left from a one-way highway into the nearest lawfully available lane of a one-way highway on which vehicular traffic travels to the left. No turn may be made on a red signal if lanes of moving traffic are crossed or if a sign at the intersection prohibits a turn. In making a turn on a red signal vehicular traffic shall yield the right-of-way to pedestrians and bicyclists lawfully within a crosswalk and to other traffic lawfully using the intersection.
   (d) Green arrow. 1. Vehicular traffic facing a green arrow signal may enter the intersection only to make the movement indicated by the arrow but shall yield the right-of-way to pedestrians and bicyclists lawfully within a crosswalk and to other traffic lawfully using the intersection. When the green arrow signal indicates a right or left turn traffic shall cautiously enter the intersection.
   2. No pedestrian or bicyclist facing such signal shall enter the roadway unless he or she can do so safely and without interfering with any vehicular traffic.
   (2) In the event an official traffic signal is erected and maintained at a place other than an intersection, the provisions of this section are applicable except as to those provisions which by their nature can have no application. Any stop required shall be made at a sign or marking on the pavement indicating where the stop shall be made, but in the absence of any such sign or marking the stop shall be made at the signal.

346.38 Pedestrian control signals. Whenever special pedestrian control signals exhibiting the words “Walk” or “Don’t Walk” are in place, such signals indicate as follows:
   (1) Walk. A pedestrian, or a person riding a bicycle in a manner which is consistent with the safe use of the crossing by pedestrians, facing a “Walk” signal may proceed across the roadway or other vehicular crossing in the direction of the signal and the operators of all vehicles shall yield the right-of-way to the pedestrian or bicyclist.
   (2) Don’t Walk. No pedestrian or bicyclist may start to cross the roadway or other vehicular crossing in the direction of a “Don’t Walk” signal, but any pedestrian or bicyclist who has partially completed crossing on the “Walk” signal may proceed to a sidewalk or safety zone while a “Don’t Walk” signal is showing.

346.43 Penalty for violating sections 346.37 to 346.42. (1) (b) 2. Any operator of a bicycle violating s. 346.37, 346.38 or 346.39 (duty to obey traffic lights) may be required to forfeit not more than $20.

346.47 When vehicles using alley or nonhighway access to stop. (1) The operator of a vehicle emerging from an alley about to cross or enter a highway from any point of access other than another highway shall stop such vehicle immedi-
atey prior to moving on to the sidewalk or on to the sidewalk area extending across the path of such vehicle and shall yield the right-of-way to any pedestrian or bicyclist and upon crossing or entering the roadway shall yield the right-of-way to all vehicles approaching on such roadway.

346.49  Penalty for violating ss. 346.44 to 346.485.  (1)  (b) Any operator of a bicycle violating s. 346.46 (duty to stop signs) may be required to forfeit not more than $20.

(2)  (b) Any operator of a bicycle violating s. 346.44 (duty to stop at signals indicating approach of train) may be required to forfeit not more than $20.

346.59  Minimum speed regulation.

(2)  The operator of a vehicle moving at a speed so slow as to impede the normal and reasonable movement of traffic shall, if practicable, yield the roadway to an overtaking vehicle whenever the operator of the overtaking vehicle gives audible warning with a warning device and shall move at a reasonably increased speed or yield the roadway to overtaking vehicles when directed to do so by a traffic officer.

346.60  Penalty for violating sections 346.57 to 346.595.

(5)  (a) Any operator of a bicycle who violates s. 346.57 (speed limits) may be required to forfeit not more than $20.

(b) Any operator of a bicycle who violates s. 346.59 may be required to forfeit not more than $10.

346.77  Responsibility of parent or guardian for violation of bicycle and play vehicle regulations. No parent or guardian of any child shall authorize or knowingly permit such child to violate any of the provisions of ss. 346.78 to 346.804 and 347.489.

346.78  Play vehicles not to be used on roadway. No person riding upon any play vehicle may attach the same or himself or herself to any vehicle upon a roadway or go upon any roadway except while crossing a roadway at a crosswalk.

346.79  Special rules applicable to bicycles. Whenever a bicycle is operated upon a highway, bicycle lane or bicycle way the following rules apply:

(1) A person propelling a bicycle shall not ride other than upon or astride a permanent and regular seat attached thereto.

(2)  (a) Except as provided in par. (b), no bicycle may be used to carry or transport more persons at one time than the number for which it is designed.

(b) In addition to the operator, a bicycle otherwise designed to carry only the operator may be used to carry or transport a child seated in an auxiliary child’s seat or trailer designed for attachment to a bicycle if the seat or trailer is securely attached to the bicycle according to the directions of the manufacturer of the seat or trailer.

(3) No person operating a bicycle shall carry any package, bundle or article which prevents the operator from keeping at least one hand upon the handle bars.

(4) No person riding a bicycle shall attach himself or his bicycle to any vehicle upon a roadway.

(5) No person may ride a moped or motor bicycle with the power unit in operation upon a bicycle way.

346.80  Riding bicycle on roadway.  (1)  Unless preparing to make a left turn, every person operating a bicycle upon a roadway carrying 2-way traffic shall ride as near as practicable to the right edge of the unobstructed traveled roadway, including operators who are riding 2 abreast where permitted under sub. (2). On one-way roadways, the operator of the bicycle shall ride as near as practicable to the right edge or left edge of the unobstructed traveled roadway, including operators who are riding 2 abreast where permitted under sub. (2). Every person operating a bicycle upon a roadway shall exercise due care when passing a standing vehicle or one proceeding in the same direction, allowing a minimum of 3 feet between the bicycle and the vehicle.

(2)  Persons riding bicycles upon a roadway shall ride single file on all roadways which have center lines or lane lines indicated by painting or other markings and in all unincorporated areas. On roadways not divided by painted or other marked center lines or lane lines, bicycle operators may ride 2 abreast in incorporated areas.

(4) No person may operate a bicycle or moped upon a roadway where a sign is erected indicating that bicycle or moped riding is prohibited.

(5) Except as provided in ss. 346.23, 346.24, 346.37 and 346.38, every rider of a bicycle shall, upon entering a highway, yield the right-of-way to motor vehicles.

346.802  Riding bicycle on bicycle lane.  (1)  (a) Unless 2-way traffic is authorized under par. (b), every person operating a bicycle upon a bicycle lane shall ride in the same direction in which vehicular traffic on the lane of the roadway nearest the bicycle lane is traveling.

(b) The governing body of any city, town, village or county may authorize 2-way traffic on any portion of a roadway which it has set aside as a bicycle lane. Appropriate traffic signs shall be installed on all bicycle lanes open to 2-way traffic.

(2)  (a) Unless otherwise provided under par. (b), a person operating a bicycle may enter or leave a bicycle lane only at intersections or at driveways adjoining the bicycle lane.

(b) A person may leave a bicycle lane at any point by dismounting from the bicycle and walking it out of the lane. A person may enter a bicycle lane at any point by walking his bicycle into the lane and then mounting it.

(3)  Every person operating a bicycle upon a bicycle lane shall exercise due care and give an audible signal when passing a bicycle rider proceeding in the same direction.

(4)  Every operator of a bicycle entering a bicycle lane shall yield the right-of-way to all bicycles in the bicycle lane. Upon leaving a bicycle lane, the operator of a bicycle shall yield the right-of-way to all vehicles and pedestrians.

346.803  Riding bicycle on bicycle way.  (1)  Every person operating a bicycle upon a bicycle way shall:

(a) Exercise due care and give an audible signal when passing a bicycle rider or a pedestrian proceeding in the same direction.

(b) Obey each traffic signal or sign facing a roadway which runs parallel and adjacent to a bicycle way.

(2)  Every person operating a bicycle upon a bicycle way open to 2-way traffic shall ride on the right side of the bicycle way.

(3)  Every operator of a bicycle entering a bicycle way shall yield the right-of-way to all bicycles and pedestrians in the bicycle way.

346.804  Riding bicycle on sidewalk.  When local authorities under s. 346.94 (1) permit bicycles on the sidewalk, every person operating a bicycle upon a sidewalk shall yield the right-of-way to any pedestrian and shall exercise due care and give an audible signal when passing a bicycle rider or pedestrian proceeding in the same direction.
346.82 Penalty for violating sections 346.77 to 346.804. (1) Any person violating ss. 346.77, 346.79 (1) to (3) or 346.80 to 346.804 may be required to forfeit not more than $20.

(2) Any person violating s. 346.78 or 346.79 (4) may be required to forfeit not less than $10 nor more than $20 for the first offense and not less than $25 nor more than $50 for the 2nd or subsequent conviction within a year.

346.94 Miscellaneous prohibited acts. (1) Driving on sidewalk. The operator of a vehicle shall not drive upon any sidewalk area except at a permanent or temporarily established driveway unless permitted to do so by the local authorities.

(11) Towing sleds, etc. No person shall operate any vehicle or combination of vehicles upon a highway when such vehicle or combination of vehicles is towing any toboggan, sled, skis, bicycle, skates or toy vehicle bearing any person.

(12) Driving on bicycle lane or bicycle way. No operator of a motor vehicle may drive upon a bicycle lane or bicycle way except to enter a driveway or to enter or leave a parking space located adjacent to the bicycle lane or bicycle way. Persons operating a motor vehicle upon a bicycle lane or bicycle way shall yield the right-of-way to all bicycles within the bicycle lane or bicycle way.

346.95 Penalty for violating sections 346.87 to 346.94. (1) Any person violating s. 346.87, 346.88, 346.89 (2), 346.90 to 346.92 or 346.94 (1), (9), (10), (11), (12) or (15) may be required to forfeit not less than $20 nor more than $40 for the first offense and not less than $50 nor more than $100 for the 2nd or subsequent conviction within a year.

347.489 Lamps and other equipment on bicycles and motor bicycles. (1) No person may operate a bicycle or motor bicycle upon a highway, bicycle lane or bicycle way during hours of darkness unless the bicycle or motor bicycle is equipped with or the operator is wearing a lamp emitting a white light visible from a distance of at least 500 feet to the front of the bicycle or motor bicycle. A bicycle or motor bicycle shall also be equipped with a red reflector that has a diameter of at least 2 inches of surface area on the rear so mounted and maintained as to be visible from all distances from 50 to 500 feet to the rear when directly in front of lawful upper beams of headlamps on a motor vehicle. A lamp emitting a red light visible from a distance of 500 feet to the rear may be used in addition to but not in lieu of the red reflector.

(2) No person may operate a bicycle or motor bicycle upon a highway, bicycle lane or bicycle way unless it is equipped with a brake in good working condition, adequate to control the movement of and to stop the bicycle or motor bicycle whenever necessary.

(3) No bicycle or motor bicycle may be equipped with nor may any person riding upon a bicycle or motor bicycle use any siren or compression whistle.

347.50 Penalties.

(5) Any person violating s. 347.489 may be required to forfeit not more than $20.

349.105 Authority to prohibit certain traffic on expressways and freeways. The authority in charge of maintenance of an expressway or freeway may, by order, ordinance or resolution, prohibit the use of such expressway or freeway by pedestrians, persons riding bicycles or other nonmotorized traffic or by persons operating mopeds or motor bicycles. The state or local authority adopting any such prohibitory regulation shall erect and maintain official signs giving notice thereof on the expressway or freeway to which such prohibition applies.

349.18 Additional traffic-control authority of counties and municipalities.

(2) (a) Except as provided in par. (b), any city, town or village may by ordinance regulate the operation of bicycles and motor bicycles and require registration of any bicycle or motor bicycle owned by a resident of the city, town or village, including the payment of a registration fee.

(b) A city, town or village may not prohibit the use of a bicycle equipped as provided in s. 346.79 (2) (h) to carry or transport a child in addition to the operator of the bicycle.

(3) Any county, by ordinance, may require the registration of any bicycle or motor bicycle owned by a resident of the county if the bicycle or motor bicycle is not subject to registration under sub. (2). Such ordinance does not apply to any bicycle or motor bicycle subject to registration under sub. (2), even if the effective date of the ordinance under sub. (2) is later than the effective date of the county ordinance. A county may charge a fee for the registration.

349.23 Authority to designate bicycle lanes and bicycle ways. (1) The governing body of any city, town, village or county may by ordinance:

(a) Designate any roadway or portion thereof under its jurisdiction as a bicycle lane.

(b) Designate any sidewalk or portion thereof in its jurisdiction as a bicycle way.

(2) A governing body designating a sidewalk or portion thereof as a bicycle way or a highway or portion thereof as a bicycle lane under this section may:

(a) Designate the type and character of vehicles or other modes of travel which may be operated on a bicycle lane or bicycle way, provided that the operation of such vehicle or other mode of travel is not inconsistent with the safe use and enjoyment of the bicycle lane or bicycle way by bicycle traffic.

(b) Establish priority of right-of-way on the bicycle lane or bicycle way and otherwise regulate the use of the bicycle lane or bicycle way as it deems necessary. The designating governing body may, after public hearing, prohibit through traffic on any highway or portion thereof designated as a bicycle lane, except that through traffic may not be prohibited on any state highway. The designating governing body shall erect and maintain official signs giving notice of the regulations and priorities established under this paragraph, and shall mark all bicycle lanes and bicycle ways with appropriate signs.

(c) Paint lines or construct curbs or establish other physical separations to exclude the use of the bicycle lane or bicycle way by vehicles other than those specifically permitted to operate thereon.

(3) The governing body of any city, town, village or county may by ordinance prohibit the use of bicycles and motor bicycles on a roadway over which they have jurisdiction, after holding a public hearing on the proposal.
Appendix C

Bicycle Facilities
BICYCLE FACILITIES

The following presents a brief description of the major types of bicycle facilities and the characteristics attributable to each. Graphics have been provided for each type of bicycle facility. Under Wisconsin statute 346.02 "every person riding a bicycle upon a roadway is granted all the rights and is subject to all the duties which this chapter grants or applies to the operator of a vehicle". Therefore, bicycle facilities must be designed to allow bicyclists to ride in a manner consistent with motor vehicle operation.

Shared Roadway -

On a shared roadway, bicyclists and motorists are sometimes accommodated in the same travel lane or because of narrow widths or parked vehicles, motorists may find it necessary to overtake bicyclists by switching into the oncoming travel lane. Shared roadway facilities are common on city street systems and on narrow town roads and county trunk highways. This facility type will continue to provide a very common form of bicycle accommodation. Because of the low volume of traffic, most of these roadways are currently suitable for bicycling with no additional improvements necessary.

Wide Curb Lanes -

On multi-lane arterials and collectors with higher motor vehicle volumes and/or significant truck/bus traffic, a right (curb) lane wider than 12 feet is desirable to better accommodate both bicyclists and motor vehicles in the same travel lane. This should allow motorists to overtake bicyclists without changing lanes. The four generally accepted advantages of wide curb lanes are that they:

*Accommodate shared bicycle/motor vehicle use without reducing the roadway capacity for motor vehicle traffic.

*Minimize both the real and perceived operating conflicts between bicyclists and motor vehicles.

*Increase the roadway capacity by at least the number of bicyclists capable of being accommodated.

*Assist turning vehicles in entering the roadway without encroaching into another lane and better accommodating buses and other wider vehicles.

AASHTO guidelines consider a lane width of 14 feet of usable width as being desirable on road segments where parking is not permitted in the curb lane. Usable width generally cannot be measured from curb face to lane stripe, because adjustments must be made for drainage grates (even the "bicycle safe" ones) and longitudinal joints between pavement and gutter sections. For instance, on those road segments where no parking is allowed but drainage grates and the
longitudinal joints are located 18 inches from the curb face, the travel lane (from joint line to lane stripe) should be 14 feet in width reflecting the unsuitability of bicycle riding on the outside 18 inches of the roadway in the curb flag (gutter section). Because of the presence of drainage grates, road debris in gutters and longitudinal joints, the minimum curb face-to-lane stripe width is 15 1/2 feet, assuming that the longitudinal joint is 18 inches or less from the curb face.

If parking is permitted in the curb lane, then the minimum width of the curb lane, from curb face to through travel lane is 14 feet, with 15 feet being the desirable width. In this design situation, the lane width can be measured from the curb face since parked motor vehicles can occupy the curb flag (gutter section). Conversely, when bicycles travel directly adjacent to a curb, they cannot safely operate in the gutter section.

Wide curb lanes are not striped or generally promoted as "bicycle routes", but are often all that is needed to accommodate bicycle travel. Where a wide curb lane may be considered for future restriping as a bike lane, a 17 foot curb lane is recommended. Where bicycle travel is to be encouraged, the use of a bicycle lane is typically most effective.

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**Minimum Urban Cross Section**

A - Truck Width,  B - Separation required by State Law,  C - Bicyclist's Width with 10" of maneuvering room,  D - Gutter section with 18" storm sewer inlet grates, no joint line.

Some bicycle friendly practices that can be employed in the construction of a wide curb lane are:

*Inclusion of 18" or narrower storm sewer inlet drains that are "bicycle safe" (all major manufacturers of drainage grates offer bicycle safe models).

*The curb and gutter section (curb pan or flag) of a street constructed as an integral section of the travel lane eliminating the longitudinal joint between the roadway and gutter, providing more usable space for bicyclists. This can only be done when concrete is the chosen paving...
material type for the driving lane. WisDOT District 3 is currently using integral construction on many or most of its urban state highway routes with no additional costs. Where the paving material for the travel lane is asphalt, the gutter section could be narrowed to less than the typical two feet to push the longitudinal joint closer to the curb face.

Bike Lanes

Bicycle lanes can be considered when it is desirable to delineate available road space for preferential use by bicyclists and motorists and to provide for more predictable movements by each. Bicycle lane markings can increase a bicyclist’s confidence in motorists not straying into his/her path of travel. Likewise, passing motorists are less likely to swerve to the left out of their lane to avoid bicyclists on their right. Bike lanes are generally established on urban arterials and sometimes on urban collector streets.

Bicycle lanes are delineated by painted lane markings and should always be one-way facilities and carry traffic in the same direction as adjacent motor vehicle traffic. Two-way bicycle lanes on one side of the roadway are unacceptable because they promote riding against the flow of motor vehicle traffic. Wrong-way riding is a major cause of bicycle accidents and violates the Rules of the Road stated in the Uniform Vehicle Code. Bicycle lanes on one-way streets should be on the right of the street except in areas where a bicycle lane on the left will decrease the number of conflicts (e.g., those caused by heavy bus traffic).

The use of bike lanes does require an additional commitment to maintenance. Bike lanes must be kept free of debris and gravel - the sweeping motion of passing motor vehicles will not keep the bike lanes clean. Additionally, the bike lane stripes themselves must be maintained on a regular basis.

The minimum width for a bike lane is 4 feet to the left of parked motor vehicles, or 5 feet from the curb face. The recommended bike lane width is 5 feet. There must be a clear riding zone of 4 feet if there is a longitudinal joint between the travel lane and the curb and gutter section. Where parking is permitted, the bike lane must be placed between the parking area and the travel lane, the recommended bike lane width is 5 feet, and the combination lane (including parking and bike lane segments) should have a minimum width of 14 feet.
Paved Shoulders

Wide curb lanes and bike lanes are usually preferred in restrictive urban conditions and the widened shoulder will generally be more accommodating in rural circumstances. Where it is intended that bicyclists ride on shoulders, smooth paved shoulders should be provided and maintained. Rumble strips and grooved travel lane indicators can be a deterrent to bicycling on shoulders and their benefits should be weighed against the probability that bicyclists will ride in the motor vehicle lanes to avoid them. Many states construct rumble strips with smooth short "passes" in the strips themselves to allow bicyclist shock-free passage.

![Diagram of vehicles and shoulders]

Paved shoulders are generally established on rural arterial and collector highways. Shoulder width should be a minimum of 4 feet when intended to accommodate bicycle travel. Arterial highways with shoulders less than 4 feet wide normally should not be signed as bikeways or bike routes.

Bike Path

A bike path is a bikeway that is physically separated from motor vehicle traffic by an open space or barrier, and may be within the roadway right-of-way or within an open space. Bike paths are normally two-way facilities. Bike paths may be appropriate in corridors not served by other bikeways, if there are few intersecting roadways and driveways.

Bike paths can provide good bicycle mobility under certain circumstances, especially where the bike path is truly isolated from motor vehicles, such as along rivers grades, greenways, abandoned rail lines, and connections between subdivisions and cul-de-sacs. Special care must be taken to limit the number of at-grade crossings with streets and driveways. Two-way bike paths should not be placed on or adjacent to roadways. Otherwise, a portion of the bicycle traffic rides against the normal flow of motor vehicle traffic, which is contrary to the rules of the road. Page 22 of the AASHTO bicycle guidelines provides eight problems associated with bike paths located immediately adjacent to roadways.
According to AASHTO bicycle guidelines, under most conditions, a recommended all paved width for two-directional bicycle path is 10 feet. Eight feet is considered the minimum width but this width should only be used when there is low bicycle usage, little expected pedestrian use, and no anticipated maintenance vehicle loading conditions causing damage to the pavement edges. Many communities and states have gone to a 10 feet minimum width for bike paths and 12 feet in high use areas.

Bicycle paths, especially those in urban areas, attract a multitude of different users including bicyclists, pedestrians, runners, skate-boarders, skaters (in-line and traditional), and people walking their pets. When path use is high, conflicts always arise between the different user groups. For this reason, it is impractical to expect that an urban path will be used solely by bicyclists. Under congested conditions, faster moving bicyclists (15 mph or greater) should not be using the facility without reducing their speed. The very popular Burke-Gilman trail in Seattle, Washington actually is signed as to direct "fast bicyclists" to alternate street routes instead of encouraging them to speed along on the trail. When designing bike paths in urban areas, the assumption should be that the paths will be used by almost all of the above user groups, thus making a 10 foot path width a minimum. Twelve feet or greater should be considered a desirable width.

The minimum width of a one-directional bicycle path is 5 feet. One-directional paths are seldom used in the United States, in part, because they are almost always used in a two directional fashion by bicyclists. One-directional paths should be signed and designed to limit counter-flow riding.

Where a bike path must be parallel and near to a roadway, there must be a 5-foot minimum width separation, or a physical barrier of sufficient height must be installed.

A minimum of a 2-foot "shy" or clear zone should be maintained adjacent to both sides of a bike path. The recommended width of two-way bike path structures (overpasses, underpasses, long bridges) is 12 feet (8 feet minimum width and 2 feet of shy distances on each side). Greater widths will be necessary where there is significant bicycle and pedestrian use and/or there are long grades. Widths of less than 12 feet should apply under less demanding conditions [low pedestrian and bicycle use, a relatively flat or short bridge deck, or bicyclists are permitted to use the motor vehicle section of the bridge deck (i.e. shoulder area, bike lane)]. The vertical clearance to obstructions should be a minimum of 8 feet. However, vertical clearance may need to be greater to permit passage of maintenance vehicles.

As stated earlier, abandoned rail corridors are generally regarded as providing good opportunities for bike paths. A small number of trails in the United States have even been constructed along active urban spur or branch lines after a portion of the rail corridor had been sold to the local community by the rail line owner. For instance, the City of Madison purchased and constructed a bike trail along an active rail line in the eastern portion of the city. Typically, rail line owners and operators have major concerns with joint uses within the corridor because of liability reasons and the fear that by so allowing the public closer proximity to the rail line,
more people would trespass on the actual rail line putting the trespasser at risk and the company at increased exposure. These concerns are mollified if an actual land transaction takes place between the rail line owner and community (bike path sponsor). If local communities are unable or unwilling to purchase rail corridor property for shared corridor use, like Madison has done, co-use through an agreement with the rail line owner/operator is unlikely or would at least result in lengthy negotiations and agreements.

For more discussion on design criteria, such as grades, speeds, and alignment see the AASHTO bicycle guidelines referenced in this planning guide.

**Bicycle Path on Separated Right-of-Way**

\[\text{Graded (Min.)} \quad \text{Min. Width of Pavement} \quad \text{Graded (Min.)}\]
**Group B  Bicyclists • Urban Section**

<table>
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<tr>
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<th>Less Than 2,000</th>
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<th>Over 10,000</th>
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<td>Inadequate Sight Distance</td>
<td>Adequate Sight Distance</td>
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<td><strong>wc</strong> 14</td>
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</table>

**Key:**
- **wc** = wide curb lane
- **bl** = bike lane
Appendix D

Wisconsin Department of Transportation
Facilities Development Manual
on Bicycle Facilities
INTRODUCTION

The 1991 Intermodal Surface Transportation Efficiency Act (ISTEA) places increased importance on the use of the bicycle for transportation and calls on each state highway agency to encourage its use. The Department is also required by Section 85.023 of the Statutes to "...assist any regional or municipal agency or commission in the planning, promotion and development of bikeways."

The purpose of this procedure is to provide the Department's warranting criteria for bicycle facilities and guidelines for the design of bicycle facilities.

BIKEWAY WARRANTS

The Department's policy is to provide safe, convenient and adequate bicycle facilities that will encourage bicycle riding when such facilities are warranted in accordance with the following criteria:

1. The highway or street is on an officially designated bike plan or

2. The two-way bicycle traffic volume is 25 ADT or more during the peak three months of the bicycling season where the current annual traffic volume on the highway or street exceeds 1000 ADT.

To the extent practicable, short gaps in an otherwise continuous bike facility should be completed with highway/street improvements regardless of whether or not the above warrants are met.

DESIGN GUIDELINES

There are bicycle-safe design practices that must be applied regardless of the type of improvement being developed. The most important design principle is to provide adequate width within the roadway for bicycle travel. Information about desirable widths is contained in this procedure under TYPES OF BICYCLE FACILITIES. Other bicycle-safe design factors which require attention are drainage grates, railroad crossings, and signing and striping.
Drainage Grates

Drainage grates and utility covers can be hazardous to bicyclists. The front wheel of a bicycle may drop into the openings of parallel bar drainage grates causing the bicyclists to fall off the bicycle. Likewise, grates and utility covers that are not flush with the pavement surface and located in bicyclists' expected path can cause the bicyclists to fall.

The standard inlet covers used by WisDOT (see standard detail drawings) are considered bicycle-safe. The inlet covers which are narrow and therefore encroach the least into a bicycle curb lane are Types "A", "H", "HM" and "Z". These inlet cover types should be used for new construction/reconstruction projects and also as replacement covers for 3R improvements providing they have the necessary hydraulic capacity.

Thin metal straps welded across the grate perpendicular to the direction of travel may be used as an alternative to grate replacement.

Pavement overlays should be designed and constructed to taper into drainage inlets to prevent an abrupt edge at the inlet. As an alternative, the inlet grate or utility cover can be adjusted to be flush with the new surface.

At-Grade Railroad Crossings

Where possible, a bikeway should cross railroad tracks at or near a right angle to minimize the potential for a bicyclist's front wheel becoming trapped in the flangeway and causing loss of steering control.

If the crossing angle is less than approximately 45 degrees, consideration should be given to widening the outside lane, shoulder or bicycle lane to improve the angle of approach (see Figure 1).

It is also important that the roadway surface be at the same elevation as the rails. Designers should evaluate the use of rubberized railroad crossings as they offer a good combination of smoothness and traction.

Signing and Marking

Marking and signing of bikeways shall be in accordance with the Wisconsin Manual on Uniform Traffic Control Devices and applicable local ordinances. Marking and signing requirements should be determined in consultation with the District Chief Traffic Engineer.

Pavement marking and signing are especially important at the approaches to intersections and at the ends of a bike lane. At intersections, bicyclists proceeding straight through and motorists turning right must cross paths. Motorists/bicyclists should be encouraged to make these
crossings in advance of the intersection.

Appropriate marking and signing is essential where a bike lane ends requiring bicyclists to merge with motor vehicle traffic.

**TYPES OF BICYCLE FACILITIES**

There are many ways in which roadways can be constructed or improved to enhance bicycle transportation. Shoulder bikeways are commonly used on rural highways. In urban areas, a portion of the roadway can be designated as a bike lane for the preferential use of bicycles. Wide curb lanes which allow bicycle traffic to share the traffic lane may be necessary especially where improvements are made to existing urban and suburban routes. Bikeways designated to follow a freeway or other high volume rural arterial should be located as far as possible from the roadway on a separate bike path.

**Shoulder Bikeways**

Table 1 provides shoulder paving requirements to accommodate bicycles on rural two-lane state trunk highways. When shoulder bikeways are provided on four-lane divided expressways the paved shoulder width should be 10 feet (3.0 m).

Where a bike route is planned or located on a CTH or town road, the paved width, if any, should be determined by the local government.

**TABLE 1**

<table>
<thead>
<tr>
<th>RURAL TWO-LANE STATE TRUNK HIGHWAY PAVED SHOULDER WIDTH REQUIREMENTS TO ACCOMMODATE BICYCLES</th>
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<td><strong>Motor Vehicle ADT</strong></td>
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<tr>
<td>Over 1250</td>
</tr>
</tbody>
</table>

\(^{(1)}\) See Figure 5 of Procedure 11-15-1 for other shoulder paving standards not related to bicycles.

\(^{(2)}\) For Great River Road only, pave shoulders 5 ft (1.5 m) wide. See Procedure 11-15-5.

**Bicycle Lanes on Curbed Streets**

Bicycle lanes on curbed streets serve to separate bicycle traffic from motor vehicle traffic. On curbed streets without parking, the bicycle lane is located next to the curb. The width of the bike lane measured from the face of curb should be 5 feet (1.5 m) when the curb is integral with the pavement (see Figure 2).
The minimum bike lane width should be 4 feet (1.2 m) measured between a gutter/pavement longitudinal joint and the motor vehicle traffic lane where curb and gutter exists or is allowed to be constructed (see Figure 2). Bicyclists tend to shy away from longitudinal joints.

![Diagram of bike lane - urban, no parking]

Figure 2

Where parking is permitted, the bicycle lane should always be located between the parking lane and the motor vehicle lane. The width of this combined bicycle and parking lane can vary from 14 feet (4.2 m) to 16 feet (4.8 m) depending on the width required for the parking lane (see Figure 3). The minimum width provided for bicycle travel should be 4 feet (1.2 m). A reduced total width of 13 feet (3.9 m) may be considered where site conditions and right of way restrictions preclude a greater width and providing that the traffic lane next to the bike lane is at least 12 feet (3.6 m) wide.

![Diagram of bike lane and parking lane]

*Do not use the combination of minimum parking lane width and minimum bike lane width.

Figure 3
Additional width should be provided as necessary to provide safe bicycle operation where there is frequent parking turnover, parked vehicles are mostly commercial vehicles, or motor vehicle speeds exceed 45 mph (70 km/h). Bicycle lanes should always be one-way facilities and flow in the same direction as the adjacent motor vehicle traffic.

**Shared Roadways**

On a shared roadway facility, bicyclists and motorists share the same travel lanes. A usable lane width of at least 14 feet (4.2 m) not including any gutter width is needed for a motor vehicle and bicycle to operate side by side.

Connecting highways and STHs are required to have a minimum curb to curb width of 36 feet (10.8 m) when no provision is made for parking (See Procedure 11-20-1). This would provide usable lane widths of 16 feet (4.8 m) from edge of gutter to the centerline. Shared roadways have application where physical constraints such as buildings or environmentally sensitive areas prevent widening a street to provide bike lanes.

**Adding Bike Lanes To Existing Roadways**

For rural highways, bike lanes can be provided by adding or widening paved shoulders. Bike lanes can be retrofitted into existing urban roadways using one or more of the following methods:

1. Physically widening the roadway to add bike lanes.

2. Marking or remarking the pavement to add bike lanes. For example, it may be feasible to reduce the number or width of traffic lanes or remove parking to gain space for bicycle lanes. Also, on two-way streets with four lanes, remarking for a center turn lane, two travel lanes, and two bike lanes may be possible.

**Bike Paths**

Bike paths are facilities intended for the exclusive or preferential use of bicycles. When located within the highway right of way a bike path is physically separated from motorized traffic. This separation should be as wide as possible to prevent operational problems that may occur when two-way bike traffic operates adjacent to motor vehicle traffic. Bike paths may be warranted under the following conditions:

1. High anticipated bicycle and pedestrian use.

2. A bikeway located within the roadway of the adjacent highway is considered too hazardous because of the high traffic volumes.

3. There are no reasonable alternatives for bikeways on nearby parallel routes.

4. There is a commitment to provide bike path continuity for an extensive length of the highway.
The paved width of a bike path should be 8 feet (2.4 m) minimum, 10 feet (3.0 m) desirable for two-way traffic and 5 feet (1.5 m) minimum, 6 feet (1.8 m) desirable for one way travel (see Figure 4).

A bike path should be located where there is minimal cross flow by motor vehicles or where the path will be separated from such traffic with a structure.

The AASHTO "Guide for the Development of Bicycle Facilities" includes detailed information about the design and location of bike paths.

Bike Paths on Highway Structures

The width of new highway structures should equal the width of the approach roadway including bicycle lanes and sidewalks as shown in Figure 5. The drawing of a bikeway shielded from motorized traffic by a parapet represents a two-way bike traffic condition which would be normally be the case when a bike path is routed across a bridge. The minimum width of the bike path should be 8 feet (2.4 m). However, a width of 10 feet (3.0 m) should be evaluated where one or more of the following conditions exist:

1. Bike and/or pedestrian traffic volumes are high or are expected to increase substantially in the future. Evaluation of this factor is especially important where the bike path is part of a designated bikeway system where future traffic growth can be expected once the system is completed.

2. The structure and/or its approaches have a gradient of six percent or more for more than 500 feet (150 m). Long, steep grades may cause some bicyclists to exceed the speeds at which they are competent.

3. The extra width is necessary to match the paved width of the bike path approaching the structure.

Railings, fences, or barriers adjacent to a bike lane on a structure should be a minimum of 4.5 feet (1.4 m) high.
Bike Path Grade Separations

Safety concerns may require that bicycle traffic be separated by a structure from motorized traffic or, as an alternative, bicyclist actuated traffic signals be may provided where bike paths intersect high speed/high volume highways or streets.

Authoritative information is generally not available to define these conditions. Warranting criteria developed by Finland indicates a grade separation should be considered when vehicle speeds exceed 50 mph (80 km/h) and current traffic volumes exceed 3000 ADT, but bicycle traffic volumes are not shown. Designers should therefore use engineering judgement to decide when such safety measures are necessary and cost effective by considering traffic volumes, motor vehicle speeds, site conditions and the age and experience of typical bicyclists. For example, the fact that children frequently use a bike path which intersects an arterial would be a strong reason to provide a grade separation structure.

REFERENCES

The guidelines in this procedure are based primarily on the AASHTO "Guide for the Development of Bicycle Facilities". This document may be purchased from the American Association of State Highway and Transportation Officials. For the latest information on document prices and postage rates call (202) 624-5800 and ask for publications. Figure 3 of Procedure 1-1-1 is an order form for AASHTO publications.

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Appendix E

Improving Local Conditions for Bicycling
Improving Local Conditions for Bicycling

Here are some simple ways to improve the bicycling situation in your community. For the most part, these improvements are inexpensive and require only a minimal amount of specialized bicycle planning expertise. They can help ease conflicts and congestion for all modes of transportation—cars, bikes and even pedestrians.

by John Williams, Editor of Bikecentennial's Bicycle Forum, the Journal of Bicycle Programs

Why Encourage Bicycling

Bicycling is one of the most popular forms of recreation in America—in fact, it's number two over all. It's also one of the best types of aerobic exercise. According to the Bicycle Federation of America, more than 80 million Americans ride bicycles. Further, the bicycle is an economical non-polluting energy-efficient means of transportation. Some communities have worked hard to support bike use and, as a result, significant percentages of their work forces commute by bike.

For example, more than 10% of the commute trips in Madison, Wisconsin are made by bike. Other big bicycle cities around the country include Palo Alto, California, Eugene, Oregon, Boulder, Colorado, Missoula, Montana, and Gainesville, Florida. By encouraging bicycle use, these cities have reaped benefits, such as improved air quality, reduced traffic congestion, and a healthier citizenry. While some projects they have completed have been expensive, others have not. This brochure is about those mostly inexpensive—but good—ideas.

Approaches For All Streets

Studies have shown that bicycle users can be found in all parts of a city. They share destinations and trip purposes common to other road users and, as a result, use all types of streets. For this reason, it's best to add some bicycle improvements to all streets where bikes are allowed.

Different types of users, however, generally prefer different types of streets. Children and casual adult riders often ride on quiet neighborhood streets or paths. On the other hand, serious commuting and recreational cyclists can generally be found on major streets and highways.

Fix or replace dangerous drain grates.

Drainage grates can be the bane of the bicyclist's existence. The worst ones are parallel-bar grates which can trap a bicyclist’s wheel, causing a serious crash.

Replacing such grates with bicycle-safe models is the best approach. There are numerous designs that are both bicycle-safe and hydraulically-efficient. The best design is the curb-face inlet. These present no obstacle at all to the bicycle, as long as slopes to the inlets are not excessive.

Other safe designs include steel grates that resemble honeycombs, and cast iron grates with short angled slots. Most grate manufacturers produce bike-safe models.

The installation is also important. Make sure that grates are installed level with the pavement and that they are adjusted flush with future pavement overlays.
Short of replacing drain grates, retrofitting is a viable approach, particularly in the short-term. Some agencies weld flat steel bars across the grate, perpendicular to the flow of traffic. This approach works reasonably well if you don't have to worry about snow plows. Other agencies use covers of one sort or another. These, however, can sometimes collect debris that restricts the flow of water if not cleaned frequently.

Retrofitting can solve the immediate problem and reduce an agency's potential exposure to liability. But replacing dangerous grates is the long-term solution with the least associated maintenance costs.


Patch and sweep the roads carefully.

Since bicycles have relatively narrow tires and no shock absorbers, good surface conditions are essential. And paying extra attention to the condition of the roadway edge and patching can do a lot of good.

For example, a Palo Alto, California, ordinance requires utility companies to patch their roadway excavation to a very high standard, with no big gaps or ridges. Further, if the patch fails within one year, the company must re-do the job.

Smooth roadway patches reduce the chances of bicycling crashes.

Sweeping is also an important consideration for bicyclists. Passing motor traffic moves debris off to the side of the roadway, where bicyclists often ride. As a result, sweepers should pay special attention to the right edge and to places in intersections where debris builds up.

Modify diagonal railroad crossings for safety.

Angled railroad crossings can cause bicyclists to crash, particularly if the tracks and roadway don't meet smoothly. Right angle crossings are best, since they aren't likely to divert the bicycle's front wheel. But re-routing a railroad line to accommodate bicyclists certainly isn't feasible.

Instead, there are several workable approaches to improving the situation.

First, if right-of-way considerations allow, pave tapered approaches on either side of the crossing. This allows bicyclists to cross the tracks at a right angle.

Second, if cost considerations allow, providing smooth rubberized railroad crossings eliminates the problem entirely. While these are expensive to install, they have the advantage of significantly reducing long-term maintenance costs. Some cities, such as Seattle, Washington, install sections of rubberized crossing in the outside lanes, where bicyclists are likely to ride. This can save costs for installations that solely benefit the bicyclists.

On slow-speed rail lines, an even less expensive alternative can work well. Several cities have installed flangeway filler which provides a smooth crossing at reduced cost. However, this approach isn't recommended on high speed railroad lines; the filler will not compress fast enough when a train wheel hits it and derailments can occur.


Make sure all bicycle facilities meet the 1981 AASHTO Guide or other current guidelines.

Since the late 1960s, bicycle facility designers have learned much about how bikes perform and what riders need. Some common facility mistakes still exist, however—and some are being re-created even today. These mistakes have led to numerous multi-million dollar judgments against agencies. Here are a few basic tips from the current AASHTO Guide:

Don't put two-way bikeways on one side of a street. Such facilities cause serious conflicts at intersections and driveways. Two-way bike lane use has led to a number of fatal head-on collisions. And it encourages wrong-way riding.

Curve design and sight distance are two critically important considerations.

Two-way bike lanes cause conflicts at intersections, according to AASHTO.

Don't designate sidewalk bikeways. These also cause serious car-bike conflicts at intersections and driveways, as well as conflicts between bicyclists and pedestrians. Eugene, Oregon, and other cities have found that sidewalk bikeways have extremely high accident rates.

Adequate design speed can reduce pathway dangers and agency liability.

Use a realistic design speed on separate rails. Twenty miles per hour is a reasonable design speed on level ground. On hills, increase it to 30mph or more.
Be especially careful in designing bike path curves and intersections. Curve radius is a critically important factor, as is intersection design. Sight restrictions must be eliminated as much as possible.

Shared trail use is generally unsatisfactory. While it's sometimes impossible to avoid, mixing bikes and pedestrians on a trail often leads to serious conflicts—especially if either bike volumes or pedestrian volumes are high. When shared use is unavoidable, add width and increase sight distance on curves and at intersections.


Improve Major Streets

For the experienced bicyclist, cycling on major roads, while not always pleasant, has important benefits. These benefits are the same ones that motorists appreciate. Major roads tend to be more direct than quiet neighborhood streets. They are often protected by stop signs and signals at intersections. And, those intersections often have very little traffic, which can be a big difference for cycling.

Where are the most important:

Create wide-curb lanes to reduce conflicts.

One of the best options for improving cycling conditions on major roads is to add width to the curb lanes. This approach gives motorists and bicyclists enough room to co-exist in comfort.

Further, wide curb lanes can reduce conflicts between cars on the roadway and cars waiting to exit from driveways.

According to the American Association of State Highway & Transportation Officials (AASHTO), "On highway sections without bicycle lanes, a right lane wider than 12 feet can better accommodate both bicycles and motor vehicles in the same lane and thus is beneficial to both bicyclists and motorists."

Install bicycle-sensitive traffic signals.

Demand-actuated signals are known for being unresponsive to bicycles. Bikes generally don’t have enough metal to trip the actuators. And, as a result, many bicyclists have negative attitudes regarding signals.

But times are changing. Modern detection systems can and do detect bicycles. The best design is a modified quadrupole loop (CalTrans Type D). This loop (shown in the illustration) is sensitive over its entire width but the sensitivity falls off rapidly outside. Whenever possible, this design should be used on all new intersection loop installations.

Wide-curb lanes can greatly reduce conflicts on major roads.

Tom Walsh, Assistant Traffic Engineer for the City of Madison, Wisconsin, says, "The wide curb lane is one of the most effective bicycle accommodation techniques available. It goes furthest to integrate the bicycle into the normal traffic flow, allowing the bicyclist to use the existing street system as a vehicle without adversely interfering with other vehicles passing in the same lane." He adds that "As a result, overall curb lane utilization can be improved."

How wide is wide enough? There is some benefit when lanes are wider than 12 feet. On a four-lane arterial street with 12-foot lanes, simply narrowing the inside lanes to 11 feet and widening the outside lanes to 13 feet is worth the effort, according to a study done by the Maryland DOT. And, unless the speeds are very high, the loss in capacity for the narrowed inside lanes is negligible—approximately three percent, according to the Highway Capacity Manual.

The consensus, however, seems to be that 14 to 15 feet of usable lane width is the best. This doesn’t include the curb and gutter section unless the transition is very smooth. Some agencies find that extra-wide curb lanes encourage motorists to share side-by-side, or they use 14 feet as their standard. However, this problem varies regionally, and other cities report no problems with 16-foot or even 18-foot lanes.


Narrow lanes make it more difficult for cars and bikes to share the road safely.

San Diego (CA) installation of CalTrans Type D modified quadrupole detector loop.

However, most signals can detect bicycles, if the cyclists know where to position themselves. At intersections with standard square or rectangular loops, for example, the right edge of the loop is often sensitive enough to detect bikes and can be marked with a special pavement marking. A number of cities have experimented with various designs; the san Diego design is shown below.

References: Evaluation of Wide Curb Lanes as Shared Lane Bicycle Facilities, 1985, Maryland Department of Transportation; Highway Capacity Manual, 1985, Transportation Research Board.

San Diego's pavement marking for standard square detector loops.
Improving Neighborhood Streets

Many bicyclists prefer riding on quiet neighborhood streets. These bicyclists are often less skilled than those who ride on major roads. Quiet streets, however, are not necessarily safer than busy streets. Several Federally-sponsored accident studies have shown that the majority of car-bike accidents happen on residential streets AND that residential streets may have higher accident rates than do busier roadways. Here are some things to consider:

Increase sight distance at crossings.

Visibility at intersections is crucial to everyone's safety. This is especially true of bicyclists since they are so much smaller and often harder to see than the typical car. Many car-bike crashes result from motorists' and bicyclists' inability to see each other due to sight obstructions like large bushes, fences, and parked cars.

Keeping sight lines clear at intersections can do much to improve bicycle safety. While such improvements aren't exotic, they can be very effective.

Add effective intersection controls.

In the West, many residential street intersections are uncontrolled. Unfortunately, experience suggests that motorists (and bicyclists) often misunderstand the traffic laws governing such intersections.

Consider installing traffic controls on low-volume streets which meet popular bicycle routes. These can be stop or yield signs, depending on local preference.

Improving Rural Roads

Rural roads offer miles of quiet and enjoyable cycling. Many cyclists consider this type of riding to be the very best recreation available. What can be done to improve rural roadways?

Pave shoulders on busy rural roads.

Some states, such as Wisconsin, add paved shoulders to rural highways when they reconstruct. They do this to encourage bicycling—they have a very active tourism program—and to improve conditions for motorists as well.

On narrow rural roads without paved shoulders, cars and trucks occasionally drop a wheel off the pavement edge. When the driver corrects, the wheels tend to tear up that edge. This damage can lead to continuing maintenance problems. Paved shoulders can cut down on maintenance costs by giving the motorists more room to correct steering errors. Further, paved shoulders can cut down on the incidence of run-off-the-road accidents.

Smoothly paved shoulders provide space for bicyclists and cut maintenance costs.

How wide is wide enough? Consider paving at least three- to four-feet to a reasonably high standard with adequate sub-base. The Maryland Department of Transportation, for example, covers their—previously-paved shoulders with a slurry seal for smoothness. They find that cyclists appreciate and use the smooth shoulders.

For more information, contact Bicycle Forum, P.O. Box 8308, Missoula MT 59807; or call (406) 721-1776. A free sample copy of Bicycle Forum is available for the asking.

BIKECENTENNIAL

P.O. Box 8308
Missoula, MT 59807

Please send this copy of “Improving Local Conditions for Bicycling” to:

For information on obtaining additional copies of this brochure, write to Bicycle Forum at the address shown above.
Appendix F

City of Eau Claire Bicycle/Pedestrian Safety Program
Street Safe Report
# Bicycle Crashes
Involving Motor Vehicles
1989-1991

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Source: Department of Transportation Accident Reports
Eau Claire has about 30 reported bicycle-motor vehicle crashes per year. Only a small percentage of all bicycle crashes involve a motor vehicle—most involve only the bicyclist and his of her bicycle.

In the past three years, Eau Claire has had one bicyclist fatality.

About 300 Eau Claire bicyclists make visits to doctors with injuries sustained in a bicycle crash.

The most common type of reported bicycle-motor vehicle crash in Eau Claire is failure on the part of the bicyclist to stop at a stop sign or traffic signal.

In Eau Claire, children between the ages of 10 and 14 are involved in more reported bicycle crashes than any other age group.

OUT OF 32 BICYCLE-MOTOR VEHICLE ACCIDENTS REPORTED IN 1991, ONLY ONE BICYCLIST WAS WEARING A HELMET.
Bicycle Safety Promotion in the City of Eau Claire

School presentations

The safety education officer of the Eau Claire Police Department presents information on safe bicycling and traffic laws as they pertain to bicyclists to students grades one through five.

Throughout the course of the school year the school safety officer delivers 30 presentations to an estimated 2,000 students. Each presentation is approximately 45 minutes, includes a safe bicycling film, and consists of topics including the proper methods of bicycling such as riding single file, riding with traffic flow, making lane changes, and obeying traffic safety signs and signals.

In addition, the Eau Claire Police Department takes part in several school special events each year, providing bike safety information and training.

Bike Clinics

The Eau Claire Police Department works with several civic and business groups each year to provide bicycle safety clinics for children in Eau Claire. These clinics teach basic balance and traffic maneuver exercises, including looking back without swerving, riding straight while missing potholes and crossing busy streets without getting hit by cars. Each lesson relates directly to an accident problem young cyclists have.

The police department co-hosts 10 clinics per year, with a total attendance of approximately 400 young cyclists.

Bike Patrol

The Eau Claire Police Bike Patrol was formed in 1992 to promote bicycle safety and enforce bike laws. The patrol consists of two specially-equipped multi-terrain bicycles, and is used during the summer months in high bicycle traffic areas. Officers ride during four hour patrols, and are used often to assist the regular city patrol.
Bicycle Helmet Promotion

The City of Eau Claire joined forces with several school, civic and business groups in 1992 to promote bike safety and the use of bike helmets in an ongoing campaign. The goals of this campaign are to introduce bike helmets to children and their parents, illustrate the effectiveness of wearing a bicycle helmet, and get more families to purchase and wear helmets.

Bike helmets are promoted in Eau Claire in several ways:
1. Information handouts.
2. Helmet reward programs.
3. Displays and public helmet demonstrations.
4. Helmet purchase programs in Eau Claire schools.
5. Media interviews.

This helmet promotion campaign has been evaluated for effectiveness through surveys of fourth and fifth grade Eau Claire students. The surveys showed a 13 percent increase in the number of students who own helmets. The survey analyzes in detail attitudes about bike helmets, and reasons for wearing and not wearing them.

University Bike Safety

Through crash analysis young adults age 16 to 24 were determined to be involved in a significant percentage of bicycle crashes in Eau Claire. Many of these crashes occur in areas adjacent to the University of Wisconsin-Eau Claire.

Therefore, students, faculty and staff of UW-Eau Claire have become a primary target audience for several bike safety activities. These include:

1. UW-Eau Claire Bike Expo, designed to promote safe cycling and bicycle regulation awareness in an educational, FUN setting.

2. "Don't Get Squashed" Day, held during homecoming week to promote safe walking and bicycling in the Water Street area.

3. Bike workshops for incoming freshmen, including training on anti theft, bike safety, maintenance and licensing and ordinance awareness.

4. Guard Your Gourd week, promoting the use of bicycle helmets.

5. Several bicycle and pedestrian safety displays throughout the school year.

These programs have received increased attention and support from university organizations and administration.
Study: Not many children in Eau Claire own helmets

By Bill Gherity
Leader-Telegram staff

Most Eau Claire children believe bicycle helmets help prevent injuries in crashes but only 20 percent of children own or wear the safety devices, according to a Police Department survey.

And of the children who own a helmet, only 25 percent wear them every time they ride their bicycle.

Helmets are too expensive, children don't want them and they are not "cool," are the reasons children give for not wearing the devices, said Jim Savage, bicycle/pedestrian safety coordinator.

Savage said parents play an important part in determining whether the child owns and wears a helmet.

"If parents think their children are not necessary or not expensive, they probably won't buy helmets," he said. "And, if a parent tells the child to wear a helmet, but the parent doesn't wear one, the child gets the message they don't need to wear a helmet either."

The survey recommends that parents help influence their children to wear helmets — noting that children also learn from examples set by parents. It urges parents to start their children wearing helmets while they are still riding tricycles.

Savage said 1,300 fourth- and fifth-grade students in the Eau Claire school district were surveyed about helmet use.

The average relates to a national 5 percent helmet usage by children 14 and younger, Savage said. Many children are not aware of the importance of bicycle helmets in preventing injuries sustained in crashes, he added.

He said the main reason given by students for not having a helmet is that they never thought about wearing one or wanted one. Sixty percent of students surveyed said helmets prevent injuries.

"Children have a false premise that, if they only ride occasionally or near their homes, they don't need a helmet," he said. "But in fact, most bike injuries happen close to a child's home."

While 23 percent of the survey respondents said the helmet was the main reason for not having one, a total of 58 percent of the respondents said helmets should cost between $10 and $25.

Savage said the price of helmets has gone down and many department stores sell helmets for about $20.

Besides urging parents to buy their children bicycle helmets, Savage said an informational campaign should be launched to stress to parents and children that bicycle helmets can reduce the chance of a serious head injury from a bike crash 85 percent.

The survey showed that 44 percent of the students surveyed have been injured in a bicycle accident and those 56 percent students suffered a total of 1,709 injuries.
Pedestrians question safety of crosswalks

By Ann Carverkine
The Spectator

Even though there are laws protecting pedestrians in crosswalks, safety isn't guaranteed when walking between the lines. Wisconsin has detailed laws protecting pedestrians and bicyclists, but motorists continue to disobey them. The law concerning pedestrians is stated in statute 346.34, section 1: "A vehicle shall yield the right-of-way to a pedestrian, or to a person riding a bicycle, upon the roadway which is consistent with the safe use of the crosswalk by pedestrian or a person riding a bicycle in a manner which is consistent with the safe use of the crosswalk by a pedestrian, who is crossing the highway within a marked or unmarked crosswalk.

"Many don't realize it but, if a pedestrian's feet are off the curb, technically a motorist is supposed to yield," said Public Safety Lt. David Sprick.

A section of statute 346.34 states: "If a pedestrian or bicyclist shall suddenly leave a curb or other place of safety and walk, run or slide into the path of a vehicle which is not closely behind it, it is difficult for the operator of the vehicle to yield." Witnesses should report motorists who disobey the law, Sprick said.

"It is not possible to report a license plate number, but if that is not possible, report the description of the vehicle and the driver," he said. "With that information, we canRadio the officers and hopefully apprehend the driver."

Depending on the severity of the incident and if the witness is willing to sign a complaint, the violator might be ticketed, Sprick said. "If caught, ticketing is $125 and four points," he said.

Although no pedestrians have been hit in a crosswalk this year, disregard for them is a problem.

John Chelms, transportation and transit manager, said he was driven to Eau Claire because of its reasonable cost of living and low crime rate.

However, Chelms said he was also appalled when he saw how inconsiderate motorist are to pedestrians near

"Unfortunately, there is no step to the middle of the crosswalk as cars go whizzing by," he said. "In larger cities, people get accustomed to ride

students use the crosswalk in front of Hibbard Hall between classes as cars slowly inch onto the stripped white lines. Although students and motorists use the crosswalk almost constantly throughout the day, few people know the laws concerning its use.

Safer Streets Ahead for Eau Claire

The Eau Claire Police Department, working under a federal grant, has launched a community campaign aimed at promoting bicycle and pedestrian safety in Eau Claire. The aim of the campaign, called Eau Claire Street Safe, is to:

- educate the public on bicycle and pedestrian rights and responsibilities
- examine traffic and engineering problems that exist in the city
- enforce bicycle and pedestrian laws

In turn, the Police Department and the Street Safe task force hope to reduce the number of pedestrian and bicycle crashes by one-third. The task force is composed of members of local media, insurance companies, schools, youth and adult groups, city engineering staff, student transit and the Police Department.

Eau Claire has more than 30 pedestrian and 10 bicycle crashes that involve a motor vehicle each year. It is estimated that there are as many as 100 bicycle mishaps annually in Eau Claire that require medical attention. Under the grant, the police department has formed a bike patrol to enforce and promote bicycle and pedestrian safety. The bike patrol covers all parts of the city, focusing on high-traffic and school areas. The grant enabled the department to purchase two specially-equipped mountain bikes and pays officers for time spent on patrol.

The patrol instructs people not following the laws and, more importantly, rewards those who know and abide by the bike and pedestrian rules. Bicyclists, pedestrians and motorists found following the laws are issued a Citation of Excellence along with a coupon for free food and a chance to enter drawings for larger prizes. The patrol will be active into the fall months.

The Street Safe force has hosted many activities, including school presentations on bicycle, pedestrian and school patrol safety, media interviews, parades and festivals. Eau Claire Parks and Recreation activities, and a Chippewa Valley-wide bicycle safety promotion. Activities also are scheduled in conjunction with the observance of September as pedestrian safety month.

Injury accident

An Eau Claire police officer removes a smashed bicycle from the street after it collided with a truck at the intersection of Third and Vine streets Wednesday afternoon. Police said the bike, ridden by Ray Walker, 28, of 2800 Fourth St., went through a stop sign and collided with the rear wheels of a tandem truck driven by Carl Despeset, 49, of Roseville, Minn.

Walker was treated at Luther Hospital for minor injuries. Police cited Walker.

Campus

Public Safety cracks down on bicyclists

Campus contains many problem areas

By Kim Kaletka
Spectator staff

Bicycle fines might become more common around campus because Public Safety is planning to enforce safety laws more strictly, said Sgt. Bill Ingram.

"About 2,000 people were injured in bike-related accidents in Eau Claire last year," Ingram said.

Already two bicyclists were cited Friday for speeding down the hill from upper campus. Both were traveling at 36 mph, and one was riding without a light. Each was fined $15.

The hill and stop signs near Park School are the most dangerous areas on campus, Ingram said.

The Water Street area also raises concerns about bicycle safety because of the many students and intoxicated pedestrians, said Jim Savage, Eau Claire pedestrian/bicycle safety coordinator.

"Water Street will be one of the areas where our bike patrol will be," Savage said.

People riding bicycles on the wrong side of the street is one serious problem, he said.

"The largest number of tickets are given out because of not stopping at stop signs," Savage said.
Police to use two-wheelers to spread safety

They'll watch pedestrians and bikers

By Bill Gharrity
Leader-Telegram staff

The Eau Claire Police Department will inaugurate its bike patrol Saturday at the annual Water Street Doll and Pet Parade.

Made possible by a $35,000 federal grant, the bike patrol is a community campaign by the Police Department aimed at promoting bicycle and pedestrian safety during the warm months, said Jim Savage, program coordinator.

"Eau Claire has more than 30 pedestrian and an untold number of bicycle crashes each year that require medical attention, with most not being reported to police," he said.

The most common cause of reported bike accidents in Eau Claire is from failure by the bicyclist to stop at a stop sign or traffic signal. In Eau Claire, children between the age of 10 and 14 are involved in more reported bike accidents than any other age group.

The federal grant is from the Federal Highway Traffic Safety Administration and is aimed at reducing bicycle and pedestrian accidents, said Lt. Judy Streets, head of community relations for the Police Department.

The campaign, named "Eau Claire Street Safe," will run through October. Its aims are to educate the public on bicycle and pedestrian rights and responsibilities; examine traffic and engineering problems that exist in the city; and enforce bicycle and pedestrian laws. Another goal is to promote awareness of the need for helmets.

Streets said 28 officers have signed up for duty on the bike patrol. They will ride on off-duty hours with funds from the grant paying their wages.

Streets said the department has ordered two 21-speed mountain bicycles that will be clearly marked as Police Department vehicles. Officers will be in uniform and will have the option of wearing shorts during warm weather.

Savage said officers also will be handing out citations of excellence to people they observe with good bicycle and pedestrian safety habits.

Two officers looking forward to the bike patrol are Patrol Officer Todd Trapp and Officer Quin Loshaw, school liaison officer.

"Loshaw, a 10-year veteran, said he has contact with children through his job and sees a lot of unsafe bicycle practices around the schools. He hopes to focus his efforts around the middle schools, emphasizing bike safety.

Loshaw and his wife, Kathy, try to bicycle daily with their sons, Kyle, 1, and Ryan, 6."

Loshaw rides his bike to warp whenever possible and is looking forward to the bike patrol.

Trapp, an eight-year veteran, also is a bicycle enthusiast. He volunteered because he enjoys bike riding and wants to make it fun and safe for everyone. He feels the patrol will involve more contacts with people, especially children, and hopes the safety campaign will reduce accidents.

The grant enabled Trapp to attend a one-week bicycle crash reconstruction course at Texas A&M University at College Station, Texas. The other officers attended a bicycle safety workshop conducted in March by the State Department of Transportation at the local National Guard armory.

Streets said the officers will work in four-hour shifts during daylight hours and will patrol primarily in areas where many bicycle and pedestrian accidents occur. Some of those areas are Water Street, East Madison Street, Birch Street and Western Avenue.

Officers also will work special events like Sawdust City Days, the July 4 parade, the air show Aug. 29 and 30 and other events that generate pedestrian and bicyclists.

This is not the first time the Police Department has made use of a bike patrol, but it is the first time such a patrol will concentrate on bicycle and pedestrian safety.

Streets said in 1983 plain clothes officers took to the streets on bikes to patrol areas hard to reach by squad cars. The bike squad concentrated its efforts at night and was used as a deterrent to crime. It operated one summer.

Some bicycle patrols were used in a similar manner in 1988 by the special operations team working nights.
Appendix G

Motorist/Bicyclist Crash Analysis
Bicycle Forum Technical Note Series

Bicycle-automobile crashes make up a small but important part of the bicycle accident picture. For example, the vast majority of all bicyclist fatalities result from car-bike collisions. And the majority of reported bike accidents involve cars. Unfortunately, few people really understand just how these accidents happen.

The purpose of this Bicycle Forum Technical Note is to introduce the most serious accident types. Other Notes will discuss ways of dealing with them.

Back in the mid-seventies, Ken Cross and Gary Fisher of Anacapa Sciences, working with the National Highway Traffic Safety Administration (NHTSA), produced a landmark three volume report called A Study of Bicycle-Motor Vehicle Accidents. The authors looked at reported car-bike crashes in four widely-separated communities and found striking similarities. As a result, they were able to classify the accidents in a way that hadn't been tried before (see chart at right).

They came up with seven broad classes of accidents with 36 different specific types. These types gave the bicycle professional most of the information necessary to design effective safety programs.

As a result, professionals and volunteers have used the same typing system to classify accidents in such cities as Eugene, OR, Cranford, NJ, Missoula, MT, Boulder, CO, Gainesville, FL, and Palo Alto, CA. They have used the statistics to mold their programs and you can do the same.

There are several ways you can do this. You can use the study "as is" to direct your program aims. For example, you won't go far wrong if you simply pick out the biggest accident problems in the list and work on them. To serve this purpose, and to introduce you to some highlights of the study, we've focused on six of the most common accident types in this report.

by John Williams, Editor of Bicycle Forum Magazine.

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Class A/Type 1: Cyclist exits driveway and fails to yield
6.7% of_fatal_s and 5.7% of non-fatal_s; median cyclist age: 9 years

The driveway ride-out most often happens during daylight when a very young rider darts out into a quiet neighborhood street without stopping, without looking, and without yielding to traffic on the street.

In the majority of cases, the motorist’s speed isn’t a factor.

Factors include:
- bicyclist’s age and lack of traffic experience
- sight-obstructions like bushes, fences and parked cars.

For more details, check the reference list on the last page.

This “boilerplate” approach to using the study works best in cities and towns without large adult cyclist populations or other factors which could affect the numbers. If you suspect your community has such complications, it’s best to take a closer look.

Why do your own study

If you do your own study, you may find that certain accident types are more important in your community than in the cities that Cross and Fisher studied. In college towns, for example, adult accident types—types 9, 23 and 24, for example—are more common than they are in non-college towns. You may also find that night-time accidents are common.

In Missoula, Montana, for example, about 20% of the reported crashes happen at night. Their accident study helped bike program staff accurately target safety public service announcements.

If you live in a town with sidewalk bikeways, you may find that “Ride-out” accidents (Class A) are common, as Diana Lewiston did in her study of Palo Alto, California.

How to do your own study

To classify your own crashes, you’ll need access to the car-bike accident reports. If you work for the city police department, this should be easy. If you work in another department, or are a volunteer, you will need to arrange something with the police. Perhaps, you could get copies of the reports, but with the names and addresses blacked out. Or, perhaps you could work with the police department’s traffic safety unit.

If you decide to do your own study, there’s plenty of help available. The NHTSA, for example, publishes several manuals on the Cross-Fisher typing approach. You
could also pick up the basics from reading Cross’ brief summary report, “Bicycle Safety Education: Facts & Issues” (see reference list for ordering information). At less than $1.00 per copy, this report is a tremendous bargain.

Once you get access to the reports, make photocopies for your files. You may need to go back to the reports if you have future questions or need to double check the information. You’ll find that the diagram is the most important part of the accident report; without it, you’ll have a much harder time deciding on the accident type.

Next, set up a master score sheet with at least the following categories:

- Accident type and class
- Date, day and time
- Location
- Cyclist’s age and sex
- Comments (wrong way bike, no lights at night, etc)

Once you’ve looked at each report and recorded the information, total the numbers for each class and type and figure the percentages. With only a few reports, you won’t be able to get a reliable picture but over time, as your file tops 100, 200 and more reports, you’ll be able to depend on the numbers with more assurance.

If you’re good with statistics, or can find someone who is, you can test the results for statistical significance.

Finally, you can use your study to help develop strategies for improving bike safety in your town. And, since you’ve done your homework, you’ll be able to target your efforts.

What these studies won’t do

Analyzing your reported car-bike crashes will tell you a lot about some of the most serious cycling problems in your community. But

Class D/Type 13: Motorist hits cyclist while overtaking
24.6% of fatalities; 4.0% of non-fatal; median cyclist age: 18-20 years

Overtaking typically happens on two-lane rural-type roads. Two-thirds of the cases happen at night. The motorist fails to see the bicyclist in time while passing. Because it often happens on high speed roads, it tends to be fatal. It causes half of all rural cycling deaths and 10% of urban fatalities.

Factors include:
- Night time (and no bike lights);
- High car speeds (e.g. 55 mph);
- Drinking motorist (30%+);
- No lights on bike (90%+)

Class E/Type 18: Cyclist turns left in front of passing car
8.4% of fatalities; 8.4% of non-fatal; median cyclist age: about 12 years

In this daytime crash, a young bike rider turns left without looking back at traffic or signalling and is hit by a passing car. It often happens on minor roads. Some observers suggest the riders involved lack the skill to confidently look back for traffic without swerving; others say the riders mistakenly believe they can hear all traffic coming from behind.

Factors include:
- Cyclist’s failure to scan behind;
- Cyclist’s failure to yield.

Class F/Type 23: Motorist turns left, hits oncoming bike
No fatalities but 7.6% of non-fatal; median cyclist age: about 20 years

In these daylight accidents, the motorist turns left at an intersection without yielding to an oncoming bike. The cyclist is older than in most crash types. This is a very common accident type (often #1) in towns with large adult rider populations.

Factors include:
- Motorist doesn’t notice bike;
- Motorist misjudges cyclist’s speed or intended course;
- Cyclist maybe too far right.
it won’t tell you everything. Think
of reported car-bike crashes as
simply the tip of the iceberg,
eventually very important and easily
tabulated “tip.” Bicycle accident
researchers know that only a small
fraction of all serious bike crashes
are ever reported.

For example, the Police in one
North Carolina town once told
that city’s Bike Coordinator that
“there’s no bike accident problem
here.” As evidence, they showed
her records of fewer than ten
reported crashes over a five year
period. But she looked further.
She contacted the local hospital’s
emergency room doctors and
learned that they treated an aver-
age of ten serious bicyclist injuries
per week. They dealt with hun-
dreds of injury-producing bicycle
accidents every year. The police
just didn’t have the real picture.

As a rule of thumb, you can fig-
ure that fewer than 10 percent of
all serious injury-producing ac-
cidents get reported. Many of these
are falls, collisions with stationary
objects, collisions with pedestri-
ans and other non-car-related acci-
dents. Among car-related crashes,
less than 30 percent of the serious
accidents get reported.

Safety professionals in towns
like Eugene, OR, Boulder, CO and
Madison, WI, have worked close-
ly with the local hospitals to learn
more about these crashes. Some of
their studies are listed at right.

While these studies are valuable
for showing the overall casualty
picture and giving you gross num-
bers, they do not give the kind of
detail you get with studies like
the Cross-Fisher report. You won’t
learn how the accidents hap-
pened—at least not in any reliable
way. For that reason, you’re best
off if you can combine these two
sources of information.

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