

PURPOSE AND NEED FOR PROPOSED ACTION **1.0**

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The Purpose and Need describes the reasons why the project is being considered. The Purpose and Need for the WIS 23 corridor remains the same as stated in the 2010 Final Environmental Impact Statement (FEIS) and in the Limited Scope Supplemental Draft Environmental Impact Statement (LS SDEIS). The Purpose and Need in this combined LS SFEIS and ROD (LS SFEIS/ROD) includes the following:

- The 1.0 Background section was added in the LS SDEIS to summarize the project timeline and why a LS SDEIS and a LS SFEIS/ROD were prepared.
- Since the release of the 2010 FEIS a new travel demand model has been completed based on implementation of WisDOT's updated traffic forecasting methodology. Many state highways have experienced lower traffic volume trends. These two factors warranted the preparation of new 2035 forecasts for the WIS 23 corridor. The revised 2035 forecasts presented in this document are lower than those presented in the 2010 FEIS. More detailed explanation on these revisions can be found in Section 2.0 Alternatives and Appendix A.
- The traffic operational analysis, which analyzes how much congestion roadways experience, has been updated since the 2010 FEIS using the procedures from the 2010 Highway Capacity Manual (Transportation Research Board, 5th Edition, 2010) and updated traffic forecasts.
- The crash data has been updated since the 2010 FEIS and 2013 LS SDEIS with the most recent five years of available data (2008 to 2012). WisDOT changed its method of reporting average state crash rates since the publication of the 2010 FEIS. The new methodology increased the number of roadway classifications used to report statewide crash rates. The new methodology also only provides five-year rolling averages rather than the yearly averages that were previously reported.
- Section 1.5 has been added since the 2010 FEIS and describes the Purpose and Need screening criteria that was used to evaluate alternatives to determine if they satisfied the Purpose and Need. This information was necessary due to the revised traffic forecasts. Since the forecasts were lower than those presented in the 2010 FEIS, an updated analysis of the alternatives was completed to validate the range of alternatives analyzed in the 2010 FEIS.

Maroon text signifies updates addressing changed conditions or analysis, clarifications, or additional information. Items that are considered revisions that target specifically identified issues in the January 19, 2012 Notice of Intent to prepare an LS EIS are shown in blue text.

Yellow highlight signifies updates from the LS SDEIS to this LS SFEIS/ROD.

For tables and figures, the title of the Table or Figure has been shown in maroon or blue to indicate whether it has been revised since the 2010 FEIS.

1.0 DOCUMENT BASIS AND DESCRIPTION

A Draft Environmental Impact Statement (DEIS) was published for WIS 23 from Fond du Lac to Plymouth in November 2004. Figure 1.1-1 shows the approximately 19.1-mile corridor limits. The DEIS evaluated alternatives that addressed system, capacity, and safety needs on this corridor. Because of modifications and augmentations in the project alternatives, a reevaluation determined that a Supplemental Draft EIS (SDEIS) was needed. The reevaluation was formally signed with the release of the SDEIS, in December 2009. The release of the SDEIS was followed by a Final EIS (FEIS) released in June 2010. The Federal Highway Administration (FHWA) issued a Record of Decision (ROD) on September 27, 2010. The ROD approved the 4-Lane Build On-Alignment Alternative for WIS 23 from Fond du Lac to Plymouth, the construction of several interchanges, the extension of a multiuse trail, and the corridor preservation for two interchanges and several grade separations.

Since the time of approval, the Wisconsin Department of Transportation (WisDOT) has been purchasing right of way along the corridor. Some right of way was previously purchased before the ROD through the hardship acquisition process.¹ Following the filing of the complaint by the 1000 Friends of Wisconsin,

¹ On prolonged studies, property owners may be eligible for hardship acquisition. Affected property owners may make a formal request to WisDOT to purchase their property as a "hardship." The owner must show that the marketability of the property has been adversely affected by the proposed plan and that a prolonged delay in the acquisition will cause them undue economic hardship. Once WisDOT receives such a request, WisDOT considers the request and follows the procedures for Early and Advanced Acquisitions in accordance with the WisDOT Real Estate Program Manual (WisDOT, August 2012.) https://trust.dot.state.wi.us/extntgtwy/dtid_real_estate/repm/repm.htm and 23 CFR Section 710 Subpart E.

further acquisition was initially restricted to those parcels that were already in the process of being acquired. This restriction was later revised to allow continued acquisition following parcel-by-parcel reviews to ensure the acquisition would have no bearing on those items being further evaluated as part of the Limited Scope Supplemental DEIS (LS SDEIS) and this LS SFEIS/ROD. This included the reanalysis of lesser alternatives for viability because of the updated and lower, traffic volume forecasts.

In June of 2011, 1000 Friends of Wisconsin, Inc. filed a complaint against the United States Department of Transportation (US DOT), the FHWA, and the WisDOT for approving the WIS 23 Corridor Expansion Project.

Additional legal proceedings were stayed until July 2014. In response WisDOT and FHWA prepared the LS SDEIS and this LS SFEIS/ROD. The LS SDEIS and this LS SFEIS/ROD were prepared in accordance with Title 23, Part 771.130 (f) of the Code of Federal Regulations (23 CFR 771.130). The applicable text states:

§ 771.130 Supplemental environmental impact statements.

(f) In some cases, a supplemental EIS may be required to address issues of limited scope, such as the extent of proposed mitigation or the evaluation of location or design variations for a limited portion of the overall project. Where this is the case, the preparation of a supplemental EIS shall not necessarily:

(1) Prevent the granting of new approvals;

(2) Require the withdrawal of previous approvals; or

(3) Require the suspension of project activities; for any activity not directly affected by the supplement. If the changes in question are of such magnitude to require a reassessment of the entire action, or more than a limited portion of the overall action, the Administration shall suspend any activities which would have an adverse environmental impact or limit the choice of reasonable alternatives, until the supplemental EIS is completed.

This LS SFEIS/ROD was prepared in accordance with Title 23, Part 771.125 of the Code of Federal Regulations (23 CFR 771.125).

The LS SDEIS and this LS SFEIS/ROD is used to address issues of limited scope associated with the overall project. These issues are as follows:

- Updating and clarifying portions of the original Purpose and Need.
- Enhancing and clarifying the discussion of alternatives that do not include capacity expansion.
- Clarifying the discussion of impacts to Section 4(f) resources and reconsidering determinations on three of those resources.
- Revising, updating, and clarifying the Indirect and Cumulative Effects (ICE) analysis.
- Seeking additional public involvement and offering a hybrid style public hearing.

This LS SFEIS/ROD update to the LS SDEIS identifies the Preferred Alternative, which is the Selected Alternative, and discusses substantive comments received on the LS SDEIS. The LS SDEIS and this LS SFEIS/ROD were combined with the original 2010 FEIS for ease of review. Original 2010 FEIS text is shown in black. Items that are considered revisions that target specifically identified issues in the January 19, 2012 Notice of Intent to prepare an LS EIS are shown in blue text. This document has also been updated to reflect changes to data, policies, or conditions since the 2010 FEIS was published. These updates are shown in maroon text. Yellow highlight signifies updates from the 2013 LS SDEIS to this LS SFEIS/ROD. In addition, for ease of review, a summary of changes is provided at the beginning of each section.

1.1 INTRODUCTION

A. Background

The WisDOT, in consultation with the FHWA, studied alternatives for providing additional highway capacity [i.e., to provide appropriate and effective Level of Services (LOS²)] on WIS 23, located in east central Wisconsin between the cities of Fond du Lac and Plymouth, in Fond du Lac and Sheboygan Counties, respectively.

As mentioned above, a DEIS was released in November 2004, a SDEIS was signed in December 2009, a FEIS was released in June 2010, and a ROD was issued in September 2010 for the project. Because of reasons previously stated, a LS SDEIS was released in July 2013.

B. Facility

The majority of existing WIS 23 is a rural 2-lane highway. Portions of the highway, on either end of the project, are located in growing urban areas. The EIS study begins at the US 151/WIS 23 interchange, on the east side of the city of Fond du Lac. The studied roadway then extends approximately 19.1 miles east to County P on the northwest side of the city of Plymouth. The study also includes the connection between the US 151 Fond du Lac bypass and the WIS 23 corridor. The portion of WIS 23 from County P to WIS 67 in Plymouth was expanded to 4 lanes in 2004 and 2005. WIS 23 from WIS 67 to I-43 in Sheboygan was previously expanded to four lanes. This leaves the Fond du Lac to Plymouth section as the last remaining 2-lane segment between Fond du Lac and I-43 in Sheboygan. This LS SFEIS/ROD focuses on the portion of WIS 23 between Fond du Lac and Plymouth. Figure 1.1-2 shows the US 151/WIS 23 connection area from the US 151 Fond du Lac Bypass through County K.

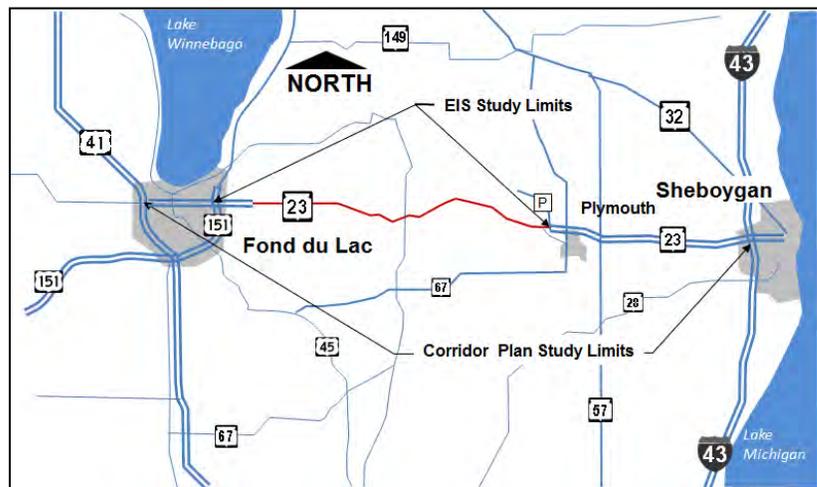


Figure 1.1-1 Project Location

1.2 PROJECT PURPOSE

The purpose of the proposed action is to provide additional highway capacity (i.e., to provide appropriate and effective LOS) to serve existing and projected traffic volumes and improve operational efficiency and safety for local and through traffic while avoiding or minimizing environmental effects. Objectives for the proposed action on WIS 23 include the following:

- Preserve the corridor for future transportation needs by coordinating local governmental land use plans with transportation improvement plans. These plans include nonmotorized transportation accommodations. Proper planning will help alleviate development pressures on WIS 23 while addressing environmental issues for the future highway project.

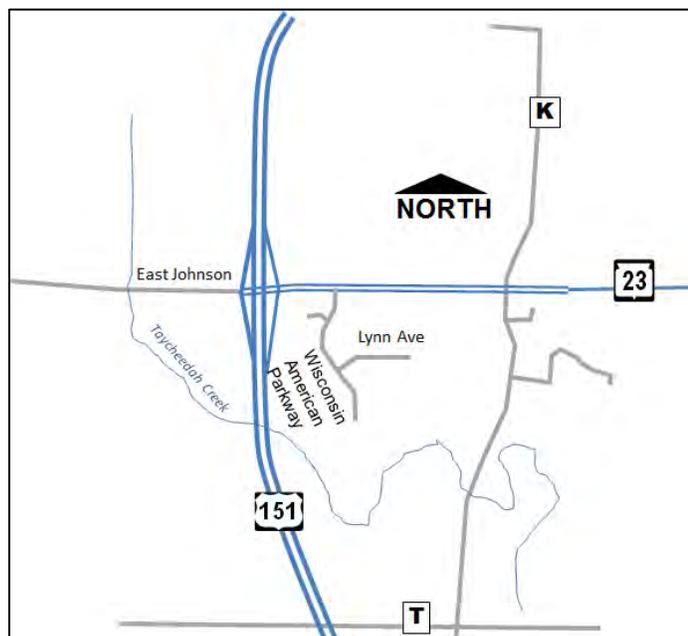


Figure 1.1-2 US 151/WIS 23 Connection Study Area

² Level of Service is a measure of traffic congestion and ranges from A (good) to F (poor).

right of way needs to improve this facility to a higher level expressway. This designation is also a *preservation* action where Official Mapping, under Wisconsin Statute 84.295(10), is used to preserve those right of way needs for the eventual actual conversion.

1.3 PROJECT NEED

This WIS 23 corridor study determines how to best meet the long-term transportation needs of the highway and region. The proposed transportation facility fulfills the following objectives and addresses the following deficiencies.

A. System Linkage and Route Importance

WIS 23 is part of the National Highway System (NHS) as designated under the 1998 *Transportation Equity Act for the 21st Century* (TEA21) and remains on the NHS under MAP-21. NHS routes serve major population centers, intermodal transportation facilities, and major travel destinations and provide connections to the national defense highway network. WIS 23 provides an NHS east-west link between Milwaukee (to the south) and Appleton (to the north).

WIS 23 is a state-designated long truck route. This designation further demonstrates its importance to commercial and economic development interests within the state. Trucks account for approximately 11 percent of the average daily traffic (ADT) using the highway.

WIS 23 is identified in the *Corridors 2030 State Highway Plan* as a Connector route (see Corridors 2030 map, Figure 1.3-1). Connector routes are 2- and 4-lane highways that connect key communities and regional economic centers to the Corridor 2030 Backbone routes. Backbone routes are a network of key multilane routes that connect major population and economic centers and provide economic links to national and international markets.

As a Connector route within this network, WIS 23 is a major link between Sheboygan and Fond du Lac and connects the Backbone routes of I-43 and US 41. When combined, these highways connect Sheboygan and Fond du Lac to other population, manufacturing, and trade centers such as Green Bay, Oshkosh, Madison, Milwaukee, Wisconsin, and Chicago, Illinois.

The 115-mile link from the Madison metropolitan area to Sheboygan and nearby recreational areas travels on 4-lane divided expressways and freeways except for the 2-lane section of WIS 23 addressed in this document. Of the 33 miles between US 151 in Fond du Lac to I-43 in Sheboygan, 14 miles is already a 4-lane divided expressway facility and the remaining 18 miles between County K and County P is a 2-lane roadway (see Figure 1.3-2).



Figure 1.3-2 4-Lane Highways in Southeast and South Central Wisconsin

B. Transportation Demand/Regional Economic Development

WIS 23 provides a connection to many economic sectors within the eastern Wisconsin region such as manufacturing, tourism, recreation, agriculture, and trade. As a 2-lane highway facility, WIS 23 will not meet the operational and safety needs to serve these economic sectors as traffic increases.

Increasing travel time and traffic hazards contribute to higher transportation costs for commuters and truck traffic. Increased travel and shipping costs result in higher product costs. This makes existing local businesses less competitive and less likely to expand and makes it more difficult for communities in the region to attract new business and industry. The consumer may also see higher product prices. Increased travel times may prevent extension of local business customer service and supply areas.

Highway improvements that lower transportation costs and increase accessibility create a positive perception of the region, increase its competitiveness, and enhance economic development opportunities. Certain industries may be attracted to corridor communities because of improved access to population centers, suppliers, or buyers. Conversely, failing to improve the existing deficient access conditions may prevent new business and employment opportunities.

Improved travel routes to recreational facilities benefit tourism in east central Wisconsin recreational areas through reduced travel time, increased safety, and more relaxed and predictable travel. Recreational destinations such as Elkhart Lake, the golf courses of Kohler, and state parks and forests have been successful in drawing local, state, national, and international visitors. Future international events at these venues will draw even more travelers that will use WIS 23.

C. Legislative and Transportation Planning History

In March 1989, WisDOT submitted its *Corridors 2020 Plan* to the Governor that described proposed Backbone and Connector components of the state's highway system. The purpose of *Corridors 2020 Plan* is to create a network of superior quality highways to foster economic development and meet intercity mobility needs into the 21st century. As mentioned in Section 1.3 A., WIS 23 was identified in the *Corridors 2020 Plan* as a Connector route and is functionally classified as a rural principal arterial. *The Corridors 2020 Plan has since been updated as the Corridors 2030 Plan and is incorporated in the Connections 2030 Multi-Modal Transportation State Plan.*

As a Connector route, WIS 23 should be upgraded to meet current standards for roadway width, level of service (LOS), and alignment. An improved WIS 23 that meets these standards will meet the transportation needs of east central Wisconsin and integrate its economy and communities with the rest of Wisconsin and the nation.

In August 1989, WisDOT adopted a statewide plan for mapping access on the state highway system. The purpose of the access plan is to provide a high LOS for through traffic while providing reasonable access to abutting properties. The plan identified Corridors 2020 (now Corridors 2030) Connector routes, like WIS 23, as highways for which managed access is essential for maintaining high LOS.

In April 1991, the *Mobility 2000* report was developed as a legislative amendment to the 1991 to 1993 transportation budget. The report incorporates the recommendations made in the Corridors 2030 Plan. WIS 23 was identified in the *Corridors 2020 Plan* as a Connector route and remains a Connector route in the *Corridors 2030 Plan*. In general, *Mobility 2000* went into more detail than the *Corridors 2030 Plan* on funding and other strategies for implementing the state's transportation program.

The Wisconsin State Legislature in the 1999 Biennial Budget enumerated WIS 23 as a major project⁴. Authorization for expanding highway capacity along the portion of WIS 23 from WIS 67 to US 41 in Sheboygan and Fond du Lac Counties is found in *Wisconsin Statute 84.013(3)(ra)*.

⁴ A major highway project is defined in Section 84.013(1)(a), Wis. Stats. There are two categories of major projects: Category 1—a project that has a total cost of more than \$30,000,000 and satisfies any of the following:

- Constructing a new highway 2.5 miles or more in length.
- Reconstructing or reconditioning an existing highway by either:
 - Relocating 2.5 miles or more of the existing highway, or
 - Adding one or more lanes 5 miles or more in length to the existing highway (applies to WIS 23 Corridor).
- Improving to freeway standards 10 miles or more of an existing divided highway having 2 or more lanes in either direction.

Category 2—a project that has a total cost of more than \$75,000,000 and is not described in Category 1 above.

D. Existing and Future Traffic Volumes and Resulting Operation

1. Traffic Volumes and Composition

For the purpose of the WIS 23 corridor study, traffic volumes are expressed as average annual daily traffic (AADT). The AADT volumes reflect average annual traffic conditions on a particular highway rather than daily or seasonal variations. Existing traffic volumes were derived from WisDOT count data and were recounted in 2011 and 2012. Generally, counts are taken over a 48-hour period during the middle of the week. Forecast volumes were updated in July 2012 by WisDOT's Traffic Forecasting Section in Madison using both a newly developed travel demand model (TDM) for the Northeast Region and other post processing measures that use traffic counts. TDMs incorporate road networks, land use, demographic, and economic data to replicate existing and future traffic conditions. TDMs provide the basis to generate traffic projection forecasts and are used for statewide, regional, and project-specific traffic forecasting purposes. TDMs are also better able to provide traffic forecasts for network changes such as new roadways or changes in roadway capacity. For WIS 23 the TDM provided specific forecasts for the different alternatives based on their capacity characteristics. The most recent traffic counts were used in post processing to apply growth rates and validate the model. The forecasting method for WIS 23 is described in more detail in two technical memos included as Appendix A of this **LS SFEIS/ROD**. Figure 1.3-3 illustrates the 2035 AADT forecasts presented in the 2010 FEIS compared with the updated 2013 LS SDEIS and **this LS SFEIS/ROD** forecasts. Table 1.3-1 lists the forecast volumes presented in the 2010 FEIS and the updated forecasts. The updated 2035 No-Build forecasts are lower than those presented in the 2010 FEIS. Figure 1.3-4 schematically illustrates the current **LS SFEIS/ROD** 2035 forecasts through the corridor. These forecasts would have been updated during the normal design process irrespective of any complaints filed against the project.

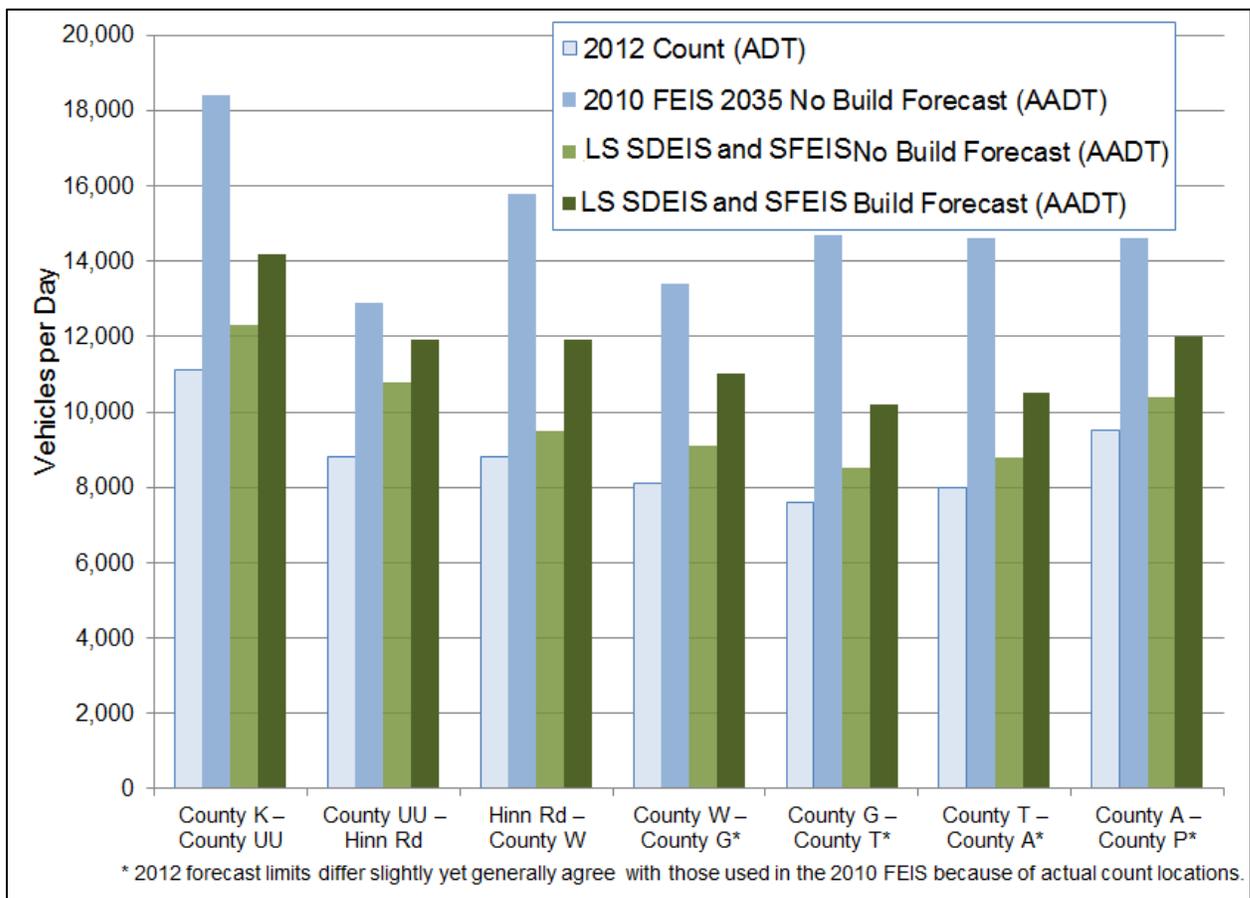


Figure 1.3-3 June 2012 Traffic Counts, 2010 FEIS 2035 Forecasts, and 2013 LS SDEIS/**2014 LS SFEIS/ROD** 2035 Forecasts

Table 1.3-1 Traffic Forecasts

Segment ^A	June 2012 Counts	From 2010 FEIS	LS SFEIS/ROD Forecasts	
		2035 Volumes Build and No-Build (No Longer Valid)	Updated 2035 No-Build	Updated 2035 Build (4-Lane)
County K–County UU	11,100	18,400	12,300	14,200
County UU–Hinn Rd	8,800	12,400-13,700 ^A	10,800	11,900
Hinn Rd–County W	8,800	15,800	9,500	11,900
County W–County G	8,100	12,200-13,400 ^B	9,100	11,000
County G–County T	7,600	11,200-14,700 ^B	8,500	10,200
County T–County A	9,500	Not Shown	8,800	10,500
County A–County P	8,000	14,600	10,400	12,000

^A Note: The segment limits in 2010 FEIS differ slightly from those presented in this table because of actual count locations.

^B The 2010 FEIS had presented several subsegments for these forecast segments.

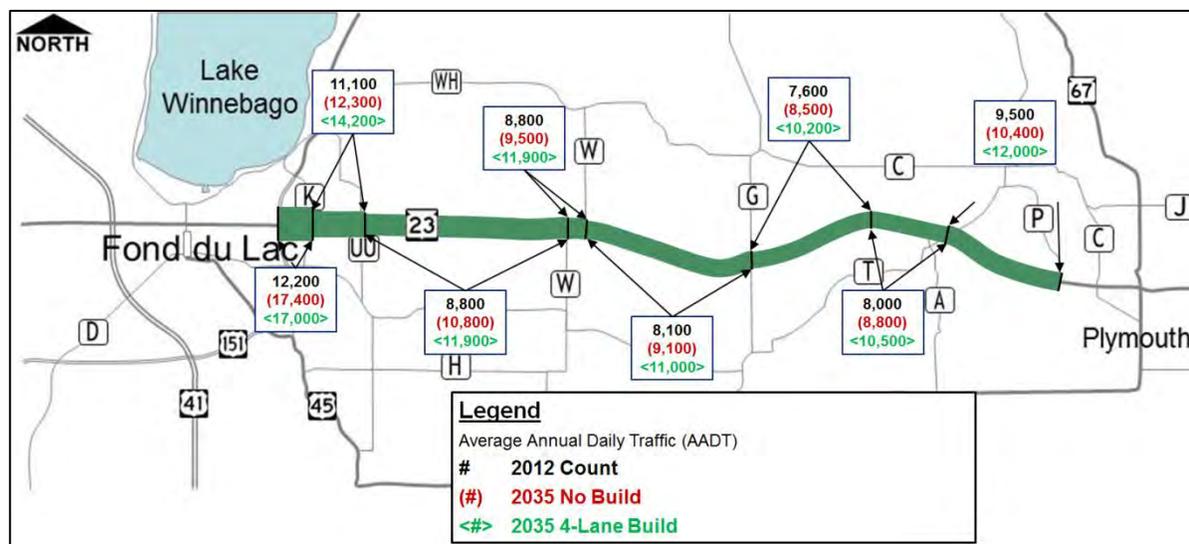


Figure 1.3-4 LS SFEIS/ROD 2035 Forecasts

Current volumes indicate that WIS 23 is approaching the levels (8,700 to 12,000 vehicles per day)⁵ where highway capacity expansion improvements are investigated. As traffic volumes increase to those forecasted for the design year 2035, the volumes will be within the range where 4-lane capacity improvements are investigated and implemented. Since 2007, the traffic growth on Wisconsin highways has increased at reduced rates. The current WIS 23 projections acknowledge these reduced growth rates. See Section 7.6 for more discussion regarding WIS 23 traffic growth rates.

Truck volumes on WIS 23 are high. The average daily truck traffic comprises about 11 percent of the total traffic volume on WIS 23, which on 2-lane roadways is particularly detrimental to roadway operational characteristics because passing requires use of the opposing traffic lane. The high number of trucks create “platoons” of traffic where vehicles are not able to travel the free-flow speed and have difficulty passing. The truck traffic imposes a direct limitation on the overall capacity of the existing road with the inability to pass, creating conflicts with slower local traffic, recreational vehicles, vehicles towing trailers, and farm machinery. During peak periods, the average travel speed ranges from 45 to 47 miles per hour (mph) on this roadway, which has a posted speed of 55 mph. This mixture of traffic impedes traffic flow creating unsafe situations and lowers the efficiency of the roadway.

⁵ Facilities Development Manual 11-10-1.1 In cases where a reduced level of service is determined to be acceptable and the use of passing lanes is found to be adequate treatment for the facility, the 8,700 AADT value for Corridors 2030 Connector routes may be increased to 12,000 AADT.

Traffic along the existing route is comprised of local and through traffic. Local traffic has origins and/or destinations within the municipalities of Plymouth and Fond du Lac as well as along the corridor. The through traffic does not have origins or destinations within these municipalities.

2. Operation Levels

Roadway LOS is a measure of how well a highway is able to serve the **travel** demands placed on it. Traffic and roadway design factors such as ADT volumes, peak-hour volumes, truck percentages, number of driving lanes, lane widths, vertical grades, passing opportunities, and numbers of access points affect the LOS. LOS ranges from A to F in order of decreasing operational quality. Each of these LOSs also corresponds to a numerical range that allows for comparison within each LOS. Table 1.3-2 shows the LOS, **speed, and percent time spent following another vehicle along WIS 23 during the peak hours of the day for the 2-lane portion of WIS 23. (For 2-lane roads, the percent time spent following another vehicle determines the LOS.)** Table 1.3-3 describes the characteristics of the LOS levels.

A Corridors 2030 Connector route should operate at LOS C, or below the numeric LOS of 4.0. These thresholds are based on a balance of social, environmental, and dollar costs and may not match with every traveler's perception of when congestion warrants roadway improvements.

Table 1.3-2 Projected Level Of Service (LOS)

	County UU to County G	County G to County P
Length	9.7 miles	8.0 miles
Posted Speed	55 mph	55 mph
Westbound		
Average Speed (mph) 2015	46.3	46.9
% Time Spent Following	76.6%	73.8%
Numeric LOS	4.77	4.59
LOS	D	D
Average Speed (mph) 2025	45.9	46.6
% Time Spent Following	78.4%	74.9%
Numeric LOS	4.89	4.66
LOS	D	D
Average Speed (mph) 2035	45.4	46.2
% Time Spent Following	78.6%	77.1%
Numeric LOS	4.91	4.81
LOS	D	D
Eastbound		
Average Speed (mph) 2015	46.4	47.0
% Time Spent Following	76.4%	73.1%
Numeric LOS	4.76	4.54
LOS	D	D
Average Speed (mph) 2025	45.9	46.7
% Time Spent Following	78.2%	74.2%
Numeric LOS	4.88	4.61
LOS	D	D
Average Speed (mph) 2035	45.4	46.4
% Time Spent Following	78.4%	76.4%
Numeric LOS	4.89	4.76
LOS	D	D

Table 1.3-3 Level of Service Characteristics (2-Lane Road)

LOS (Numeric LOS)	Characteristics
Desirable	
A (1.01 to 2.00)	Unrestricted free flow. Drivers virtually unaffected by others. High level of freedom to select speed and maneuver. Excellent level of driver comfort and convenience.
B (2.01 to 3.00)	Slightly restricted stable flow. Drivers aware of use by others. Slight restriction in speed and maneuvering. Good level of driver comfort and convenience.
C (3.01 to 4.00)	Moderately restricted stable flow. Driver operation completely affected by others. Moderate restriction in speed and maneuvering. Fair level of comfort and convenience.
Undesirable	
D (4.01 to 5.00)	Heavily restricted flow. Driver operation completely affected by others. Severe restriction in speed and maneuvering. Poor level of driver comfort and convenience.
E (5.01 to 6.00)	Unstable flow (approach greater than discharge flow). Slow speeds and traffic backups; some stoppage. Total restriction in vehicle maneuvering. High driver frustration.
F (6.01 to ~)	Forced flow (approach greater than discharge flow). Stop and go movements with long backups and delays. Forced vehicle maneuvers. Maximum driver frustration.

As a Corridors 2030 Connector route, WIS 23 does not meet the operational standards for a Connector route. Steadily increasing traffic volumes and numerous access points will decrease the mobility and efficiency of the existing highway so the highway will not meet the operational objectives of a Connector route by the year 2015.

E. Existing Highway Geometric Characteristics

Roadway factors, such as type of facility, lane widths, shoulder widths, lateral clearances, and horizontal and vertical alignments, influence the capacity of the road. These factors are discussed here.

1. Typical Sections

Existing WIS 23 is a 2-lane rural roadway with bituminous pavement that has 12-foot-wide lanes and 10-foot shoulders west of County UU. East of County UU, WIS 23 shoulder widths range from 3 to 8 feet, with the majority being 8 feet. Generally the clear zones are about 22 feet in cuts and 45 feet in fills. While these geometric characteristics of the existing highway are adequate for a 2-lane facility, traffic volumes are at a point that warrants consideration of a multilane facility to meet current and future capacity needs. As previously mentioned, a Corridors 2030 Connectors should operate at LOS C, or below numeric LOS 4.0. The current 2-lane corridor operates at LOS D and is unable to satisfy the LOS C operational goal of a Corridors 2030 Connector.

2. Horizontal and Vertical Geometrics

The overall horizontal and vertical geometrics of existing WIS 23 generally fall within WisDOT standards. However, the locations of side roads and access points intersect many of the curves in less than optimal locations. These horizontal and vertical curves, in combination with the existing terrain, make approximately 22 percent (average) of the roadway being designated as no passing zones. Even when passing zones are available, traffic volumes often prevent passing opportunities on the remaining roadway because of the opposing vehicles. The inability to pass restricts speed and maneuverability for through-traffic.

3. US 151/WIS 23 Connection

The connection between the US 151 Fond du Lac bypass and WIS 23 joins two Connector routes in the State Highway Plan. Typically connections between highways with this classification have “system” interchanges with free-flowing ramps. This higher level connection emphasizes the importance of safety and mobility between the two highways. Currently, this connection is serviced by at-grade signalized intersections at the terminals of a diamond interchange. As traffic volumes grow, it will become more important for this connection to be consistent with these two roadway classifications. Because US 151 is designated a Connector route to the south of WIS 23, and WIS 23 is designated a Connector route to the east of US 151, the free-flowing ramps would serve the northbound-to-eastbound and westbound-to-southbound movements only (see Figure 1.3-5.)

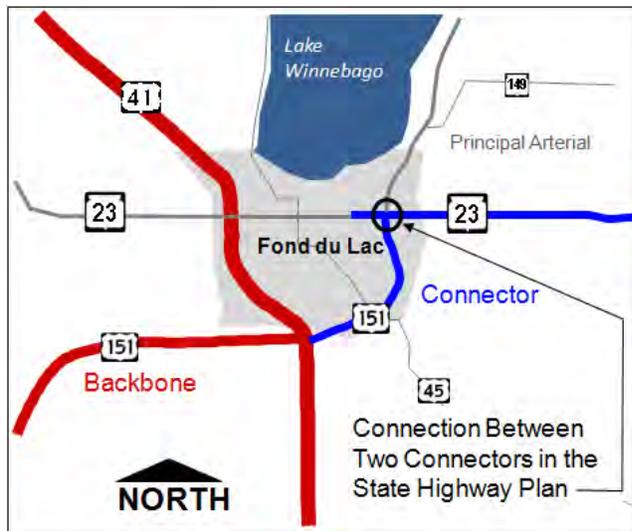


Figure 1.3-5 Highway Classification of US 151 and WIS 23

Table 1.3-4 shows the projected LOS for the existing US 151/WIS 23 diamond interchange. It also shows the vehicle to capacity (V/C) ratio that is a measure of how many vehicles the intersection or movement is carrying compared with the capacity for that intersection or movement. The controlling movement of the interchange reaches LOS E by 2030. The total LOS for all movements would fall to LOS D by 2040.

Table 1.3-4 US 151/WIS 23 Interchange LOS

Southbound Ramp Terminal–Projected PM Peak Hour							
Year	Controlling Movement				Overall		
	Movement	Delay	LOS	V/C Ratio	Delay	LOS	V/C Ratio
2030	Eastbound Through	50.3	D	0.95	25.3	C	0.67
2035	Eastbound Through	65.4	E	1.02	32.1	C	0.71
2040	Eastbound Through	87.3	F	1.09	41.8	D	0.76
Northbound Ramp Terminal–Projected PM Peak Hour							
Year	Controlling Movement				Overall		
	Movement	Delay	LOS	V/C Ratio	Delay	LOS	V/C Ratio
2030	Westbound Through	56.7	E	0.96	23.9	C	0.78
2035	Westbound Through	72.6	E	1.03	29.8	C	0.83
2040	Westbound Through	94.6	F	1.09	37.9	D	0.89

F. Access

In August 1989, WisDOT adopted a statewide access plan for managing access on the state highway system. The purpose of the access plan is to provide a high LOS for through traffic and increase safety while providing reasonable access to abutting properties. The plan seeks to balance public investments in highway

improvements, land development, tax base growth, and job creation. The plan identifies Corridors 2030 Backbone and Connector routes, like WIS 23, as a group of highways for which managed access is deemed essential to maintaining a required high LOS and safety.

There is a direct relationship between access points and crashes. Figure 1.3-6 shows a graph from the American Association of State Highway Officials Policy on Geometric Design⁶ that shows the correlation of conflicts per mile versus the crash rate on rural highways. As access points increase, so does the crash rate. Driveways for residential and commercial properties as well as side roads are located along the entire 19.1-mile WIS 23 route. There are 235 access points within the project limits, which are summarized in Table 1.3-5. This amounts to approximately 12.3 access points per mile. Excluding driveways and farm entrances, WIS 23 has 67 access points, which is about 3.5 points per mile. The mean access density (without driveways) for a Connections 2030 Connector route is 2.9 access points per mile. Vehicles entering and exiting WIS 23 at access points interrupt the flow of traffic. Drivers must adjust their travel speed to accommodate entering and exiting vehicles, and each access point creates potential for conflict and subsequent crashes.

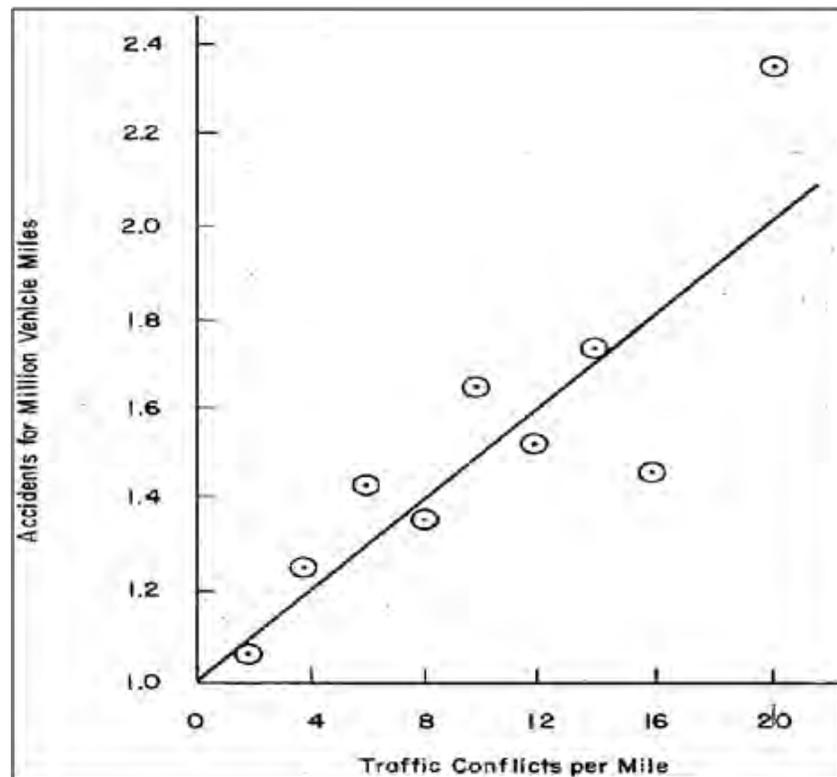


Figure 1.3-6 Relationship Between Access Points and Crash Rates

Table 1.3-5 Existing WIS 23 Access Summary

Existing WIS 23 Access Summary			
Access Type	No. of Access Points	WIS 23 Access Density (per mile)	Mean Access Density for 2030 Connector Route
State Trunk Highway Intersections	0	0	--
County Trunk Highway Intersections	16	0.8	--
Local Roads and Street Intersections	51	2.7	--
Subtotal	67	3.5	2.9
Commercial, Residential Driveways	95	5	--
Field Entrances	73	3.8	--
TOTAL	235	12.3	--

⁶ 1990 AASHTO's Policy on the Geometric Design of Highways.

G. Safety

An updated crash study report prepared for WIS 23 between County K and County P analyzed crashes from 2008 to 2012. A total of 151 nondeer crashes occurred during the 5-year study period. Overall, the corridor had a 5-year average crash rate of 54 crashes per 100 million vehicle miles traveled, which is below the 5-year statewide average crash rate for a 2-lane rural state trunk highway. Table 1.3-6 summarizes rural crashes from County K to County P.

The corridor experiences a large number of deer-vehicle collisions. About 63 percent of the crashes on WIS 23 involve collisions with deer from 2008 to 2012. Currently it is not clear whether the effects of roadway expansion increase or decrease deer-vehicle collisions. One study indicated a positive correlation (increase) between 4-lane roadways and deer-vehicle collisions.⁷ Several other studies, however, have shown a decreased rate of deer-vehicle collisions with 4-lane roadways when compared to 2-lane roadways.⁸ See Section 7.6 for more discussion.

While the overall corridor crash rate, excluding deer collisions, is slightly below the statewide average for a 2-lane rural highway, there are sections of the corridor that have higher crash rates and the crashes tend to be more severe. Figure 1.3-7 illustrates the 5-year crash rates on sections of WIS 23 compared to the 2008-2012 5-year statewide average crash rate for a 2-lane rural roadway.

Table 1.3-6 Summary of Rural WIS 23 Crashes Not Including Deer (2008-2012 Analysis)

WIS 23 Segment	Fatal Crash Rate		Injury Crash Rate		Total Crash Rate	
	WIS 23	2008-2012 Statewide	WIS 23	2008-2012 Statewide	WIS 23	2008-2012 Statewide
County K to County UU	0	0.9	41.7	26.1	106	75
County UU to 7 Hills Road	0	1.2	14.7	26.4	36	71
7 Hills Road to County W/Hinn	0	1.2	6.1	26.4	49	71
County W/Hinn to County W/ Loehr	0	1.2	51.7	26.4	142	71
County W/Loehr to Hillview Road	0	1.2	8.8	26.4	22	71
Hillview Road to County G	0	1.2	6.4	26.4	51	71
County G to County T North	0	1.2	23.6	26.4	45	71
County T North to County P/ Pioneer	0	1.2	20.1	26.4	72	71
Corridor County K to County P	0	1.2	19.0	26.4	54	71
Crash rates expressed as the number of crashes per 100 million vehicle miles traveled. Highlighted cells represent higher than average crash rates for the roadway class.						

⁷ Journal of Wildlife Management. Vol 64, Nor 3, July 2000, pp. 707 to 713.

⁸ Analysis of Deer-Vehicle Collisions, Journal of Wildlife Management, Vol 49, No. 3 July 1985; Diversity, Seasonality, and Context of Mammalian Roadkills in the Southern Great Plains, Patten and Patten, Environmental Management 2008; Modeling animal-vehicle collisions considering animal-vehicle interactions, Accident Analysis and Prevention, Lao, Zhang, Wu, and Wang, May 2011.

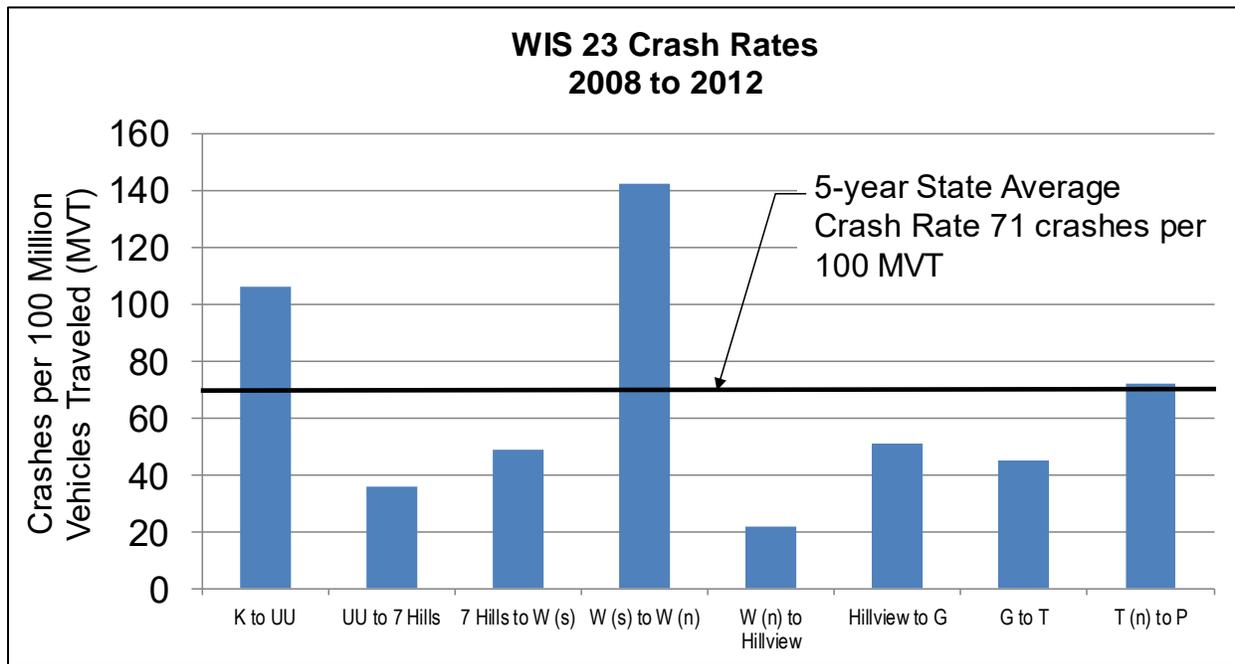


Figure 1.3-7 WIS 23 Crash Rate Compared to Statewide Average Crash Rate

Table 1.3-7 Crash Type Frequency (2008-2012)

Number	Percent of Total	Type
3	2%	Head-On
12	8%	Sideswipe Traveling Opposite Direction
13	9%	Sideswipe Travelling Same Direction
34	23%	Angle (of which 28 occurred at intersections)
31	20%	Rear End (of which 15 involved stopped left-turning vehicles and 9 involved slowing vehicles making a turn)
44	29%	Run-off-the-Road
14	9%	Other
Total = 151		

Table 1.3-8 Intersection Crashes (2008-2012)

Intersection	Number of Crashes
County K	6 crashes ⁹
County G	12 crashes
County A	9 crashes
County UU	4 crashes
7 Hills Rd	5 crashes

Of the 151 nondeer reported crashes from 2008 to 2012, the most frequent types of crashes are angle (23 percent) and run-off-the-road (29 percent). Table 1.3-7 lists the types and percentages of crashes that occurred.

Of the 151 nondeer crashes, 70 or 46 percent, were associated with intersections. (Note: Intersection crashes span multiple crash types in Table 1.3-8, meaning many different crash types occurred at intersections.) Intersections introduce turning movements where vehicles must cross through WIS 23 traffic. Intersections also introduce left-turning vehicles that stop in the through travel lane while waiting for a gap in traffic. This increases the opportunity for rear-end and sideswipe crashes. Intersections with the highest

⁹ Note, prior to the US 151 bypass opening (2005-2007), County K had numerous crashes. From 2001 to 2012, the intersection experienced 27 crashes.

number of crashes from 2008 to 2012 correspond with intersections with the highest traffic volumes. Table 1.3-8 lists them.

On high-priority corridors such as WIS 23, it is desirable to reduce all risk factors that contribute to crashes, particularly at intersections.

H. Accommodations for Nonmotorized Travel

There are several factors that highlight the need for bicycle and pedestrian accommodations along the WIS 23 corridor. They include:

- Lack of east-west bicycle facilities in the general corridor area.
- Local governmental support for dedicated non-motorized accommodations along the WIS 23 corridor through resolutions and community plans.
- 2009 Wisconsin Act 28 creating Statute 84.01(35) that requires bicycle and pedestrian facilities be incorporated into highway projects funded by certain state and federal monies¹⁰. This is further elaborated by Wisconsin Administrative Rule Trans 75 and supported by FHWA's 2010 policy statement for bicycle and pedestrian facilities.

1. Background

The existing Old Plank Road Trail currently connects the city of Sheboygan with the town of Greenbush on the east 3.5 miles of the study corridor. The Old Plank Road Trail is connected to the Interurban Trail in the city of Sheboygan and the Ice Age Trail in the Kettle Moraine State Forest. It is also connected to numerous roadways that have bike lanes, paved shoulders, or planned bicycle facilities. The Old Plank Road Trail currently accommodates bicyclists, runners, walkers, in-line skaters, and horseback riders. Sheboygan County estimates there were 164,000 users of the trail in 2012. Currently there is a 16-mile gap between the end of the Old Plank Road Trail and the Prairie Trail in Fond du Lac. The Prairie Trail connects the Wild Goose State Trail south of the city and the Peebles Trail northeast of the city. If at some point the Old Plank Road Trail connected with the Prairie Trail and the Eisenbahn Trail was extended to other State Trails, it would create a regional network of interconnected bicycle trails within Fond du Lac and Sheboygan Counties (see Figure 1.3-8).

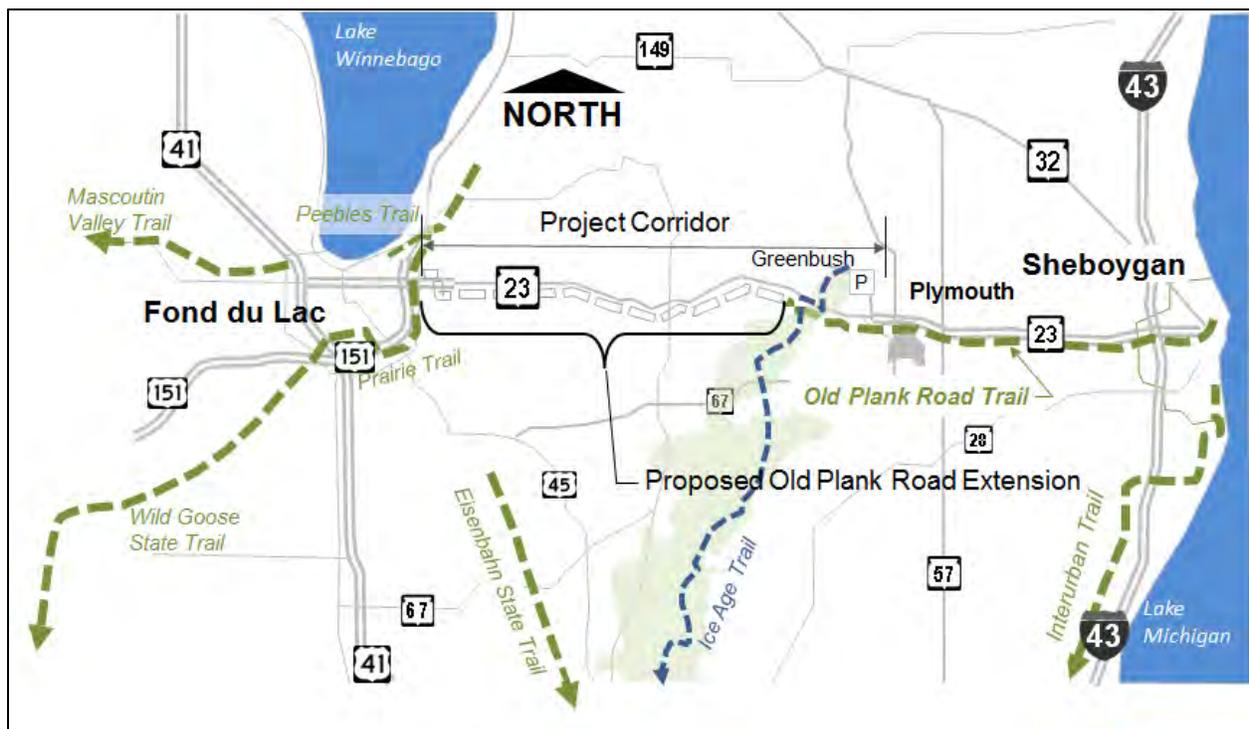


Figure 1.3-8 Regional Bike Trails Gap in Bicycle Facilities

¹⁰ Unless the project falls under one of five exceptions.

2. Shortage of East-West Bicycle Facilities on the WIS 23 corridor

The 2010 FEIS and 2013 LS SDEIS described the lack of east-west bicycle facilities along the WIS 23 corridor. Natural features along the WIS 23 corridor, including the Sheboygan River, Mullet Marsh, and the Kettle Moraine State Forest, make the local road network discontinuous in the east-west direction. For the 16-mile segment between the Old Plank Road Trail and Prairie Trail, the longest continuous stretch of east-west local roadway within 3 miles of the corridor is about 6 miles. Traveling the 16 miles from the Prairie Trail in Fond du Lac to the end of the existing Old Plank Road Trail in Greenbush, a cyclist would need to travel 19.5 miles on both WIS 23 and local roads, crossing WIS 23 twice.

The shoulder widths on the existing WIS 23 facility, combined with the high traffic volumes, provide a poor bicycle Level Of Service (LOS) of F¹¹. The Preferred 4-Lane Build On-Alignment is proposing 8-foot paved shoulders. Yet even with the expanded shoulder, the high traffic volumes and speeds associated with WIS 23 provide a bicycle LOS D in the 2035 design year. If the proposed WIS 23 roadway provided the only bicycle accommodations between Greenbush and Fond du Lac, a westbound cyclist would travel on the existing Old Plank Road Trail from Sheboygan to Greenbush, cross the 4-lane divided expressway at grade, and then ride on the WIS 23 shoulder (bicycle LOS D). This is not an ideal bicycle accommodation and requires an at-grade crossing of a 4-lane expressway.

3. Local Government Support

Local governments realized the need for and importance of providing pedestrian and bicycle accommodations along the WIS 23 corridor. Many governments have expressed their support of the trail extension either by sending FHWA/WisDOT letters and resolutions in support of a trail connection and/or incorporating the trail in their official plans. The following paragraphs summarize the letters, resolutions, and plans that demonstrate local government support for the trail.

- 2011 Sheboygan County Comprehensive Plan—An Old Plank Road Trail is incorporated in the 2011 Sheboygan County Comprehensive Plan. The plan states the proposed Old Plank Road Trail extension “would provide a connection to the City’s trail network. The length of this trail provides great connections between the cities in Sheboygan County.”
- Sheboygan County Pedestrian and Bicycle Plan, 2035—The plan lists the midterm plan goal of extending the Old Plank Road Trail as an off-road path to the county line.
- Fond du Lac County Resolution—On January 27, 2004, Fond du Lac County sent a letter to WisDOT supporting the extension of the Sheboygan County’s Old Plank Road Trail to Fond du Lac. The resolution No 134-03, adopted January 20, 2004, supported a multiple purpose recreation trail adjacent to WIS 23 between the east county line and Fond du Lac.
- Fond du Lac County Trail Map—The Fond du Lac County Trail map shows the proposed WIS 23 Trail.
- City of Fond du Lac Letter of Support—On December 4, 2003, the city of Fond du Lac sent a letter to WisDOT supporting the inclusion of a multi-modal facility as part of the WIS 23 project. The letter states, “it would be logical to extend the existing multi-modal trail from Greenbush to Fond du Lac as part of the upcoming project. This would not only connect two of the larger cities in this part of the state, it would also provide multi-modal connection to the trail along the US 151 Fond du Lac Bypass, and to other existing county and state trails.”
- Town of Empire Resolution—On March 16, 2004, the Town of Empire sent a letter to WisDOT stating that on March 10, 2004, the Town Board went on record in support of the consideration of extending the Old Plank Road Trail as part of the WIS 23 reconstruction.

¹¹ Bicycle Level of Service was recently incorporated in the 2010 Highway Capacity Manual. It measures how well a roadway accommodates cyclists, with service levels ranging from A (excellent) to F (poor). Characteristics such as roadway cross section and adjacent traffic volume and speed factor into the calculation.

- WisDOT's Connections 2030 Long-Range Multimodal Transportation Plan for the Fond du Lac Metropolitan Planning Area shows a trail connection or extension from US 151 south of WIS 23 east. According to the proposed future activities, under short term (2008–2013), the transportation plan supports the construction of a trail along WIS 23 from US 151 to the Old Plank Road Trail near Greenbush.
- WisDOT-Sheboygan County Trail Agreement—In April 2006, WisDOT and Sheboygan County signed a State/County Trail Agreement. This agreement proposed that WisDOT would provide right of way for a bicycle/pedestrian trail to provide a safe traveling route for bicycles and pedestrians. Its usage would be restricted to nonmotorized transportation purposes. Sheboygan County would be responsible for surfacing the trail from its current trail end to the county line. The County would also maintain the trail and be responsible for all future operation and maintenance of the trail.

4. Wisconsin State Statute and FHWA Policy:

In 2009, Wisconsin Act 28 created Statute 84.01(35) that requires WisDOT to ensure bicycle and pedestrian accommodations are provided on all new highway construction and reconstruction projects funded in whole or in part from certain state or federal funds. The administrative rule, Trans 75 was enacted to provide the framework for implementation of the state statute. It prohibits WisDOT from funding a new construction or reconstruction project without bicycle and pedestrian facilities unless the project falls under five exception criteria.¹²

Factors considered in the enactment of 2009 Wisconsin Act 28 and Trans 75 included health, safety, environmental transportation, and quality of life. Another important factor included encouraging meaningful mode shift from single-occupancy vehicles to nonmotorized travel modes. Infrastructure to support the mode shift must be provided and often must be in place before the true demand and use are realized. As more bicycle and pedestrian infrastructure is added and interconnected, Wisconsin residents will have the choice to use nonmotorized travel modes for work and shopping trips.

An extension of the Old Plank Road Trail, would provide a recreational function, and serve a transportation role. The city of Fond du Lac's Comprehensive Plan includes the expansion of residential housing to County UU. There already are residential subdivisions on the north side of WIS 23 east of County K. Currently there is no good bicycle or pedestrian facility that connects these residential areas to the city's employment and retail centers. Pedestrians and cyclists must use WIS 23's road shoulder to access the central city. As the area develops, a trail would provide residents with a transportation choice to access retail and employment areas. It will also provide transportation options to those without access to motor vehicles.

Enactment of the Wisconsin statute and administrative rule also helped Wisconsin comply with FHWA's policy regarding pedestrian and bicycle accommodation. FHWA's 2010 policy statement includes the following verbiage:

"The DOT policy is to incorporate safe and convenient walking and bicycling facilities into transportation projects. Every transportation agency, including DOT, has the responsibility to improve conditions and opportunities for walking and bicycling and to integrate walking and bicycling into their transportation systems. Because of the numerous individual and community benefits that walking and bicycling provide — including health, safety, environmental, transportation, and quality of life — transportation agencies are encouraged to go beyond minimum standards to provide safe and convenient facilities for these modes."

¹² The exception criteria primarily focuses on constrained urban environments where impacts would be unacceptable, freeway facilities, and sparsely populated roadways where the traffic volumes are so low the roadway itself can serve the bicycle and pedestrian traffic.

1.4 SUMMARY OF PURPOSE AND NEED

This section is shown as it appeared in the 2010 FEIS with some minor clarifications. Section 1.5, which follows, contains more detailed clarifications on what the Purpose and Need Criteria mean and how they were considered. To avoid redundancy, the clarifications are only shown within the updates in Section 1.5.

The purpose of the WIS 23 project is to provide additional highway capacity to service existing and projected traffic volumes and improve operational efficiency and safety for local and through traffic while avoiding or minimizing environmental effects. Needs that support this purpose include:

System Linkage and Route Importance—WIS 23 is a Connector route in the *Corridors 2030 State Highway Plan*. It is a rural principal arterial between the city of Fond du Lac and the city of Sheboygan and a major east-west connecting highway between these and other population centers of east central Wisconsin. It provides a major link between I-43 and US 41. WIS 23 is a state-designated long truck route. It is a vital interregional Connector and part of the *Corridors 2030 State Highway Plan* as a Connector route. As a Connector route, it should be upgraded to current standards for roadway capacity and alignment.

Transportation Demand and Regional Economic Development—WIS 23 provides a connection to numerous economic sectors with the east Wisconsin region. It helps connect east central Wisconsin to the Fox Valley, Green Bay, Milwaukee, and Madison, Wisconsin, and Chicago, Illinois, economic centers. The current roadway does not adequately meet the regional transportation needs of these economic sectors and decreases the region's competitiveness.

Legislative and Planning History—As a Connector in the State Highway Plan, WIS 23 warrants high levels of mobility and safety. Because of this, in the 1999 biennial budget, the legislature enumerated WIS 23 as a major project. Authorization for expanding highway capacity along the portion of WIS 23 from WIS 67 to US 41 in Sheboygan and Fond du Lac Counties is found in Wis Stats 84.013(3)(ra).

Existing and Future Traffic Volumes and Resulting Operation—Many portions of WIS 23 exceed the threshold that warrants a 4-lane facility. By 2035, most of the corridor will exceed these thresholds. The lack of adequate capacity will create service levels that are below desirable standards for a Connector route.

Existing Highway Geometric Characteristics—The traffic volumes on much of WIS 23 are at a level where a 4-lane cross section is considered according to current WisDOT design standards. Additionally, much of the route is marked for no passing. Even when passing zones are available, opposing traffic volumes reduce passing opportunities and result in a lower LOS. The connection between the US 151 Fond du Lac bypass and WIS 23 is a junction of two Connector routes in the State Highway Plan. To be consistent with the State Highway Plan, this junction should be served with a partial "system" interchange that provides free-flowing ramps from and to these two roadways.

Access—The high number of access points is directly related to both highway safety and mobility. WIS 23 has greater numbers of driveway and side-road access than what is recommended for a Connector route. Local traffic and farm machinery enter and exit the highway from approximately 235 county and local roads, private driveways, and field access points.

Safety—While the overall WIS 23 crash rate is below the statewide average for a 2-lane rural state trunk highway, some sections particularly near high use intersections experience higher than average crash rates. On high priority corridors such as WIS 23, it is desirable to reduce all risk factors that contribute to crashes, particularly at intersections.

Nonmotorized Travel Accommodations—Currently there are no good east-west routes or accommodations on WIS 23 for nonmotorized travel between Fond du Lac's Prairie Trail and Sheboygan County's Old Plank Road Trail. Additionally, WIS 23 provides one of the few crossings of the Sheboygan River and other topographic features, yet there is a 16-mile gap on WIS 23 where pedestrian and bicycle facilities are not provided.

1.5 PURPOSE AND NEED SCREENING CRITERIA

In 2012, the study developed screening criteria for the major components of the project Purpose and Need. The criteria was used to reexamine 2-lane alternatives that were dismissed through the 2004-2010 EIS screening process. During the preparation of the 2013 LS SDEIS, updated 2035 traffic forecasts were developed using the previously discussed travel demand model that was prepared for the Northeast Region. These forecasts were lower than those presented in the 2010 FEIS. WisDOT then reexamined some alternatives that were eliminated from detailed study in the initial EIS screening process because they did not satisfy the project Purpose and Need. These alternatives could have had increased viability based on the revised and lower 2035 traffic volume forecasts for the WIS 23 corridor. The updated screening was completed only in response to the updated traffic forecasts and the analyses. Conclusions regarding alternatives in the 2010 FEIS remain valid. The following paragraphs summarize the screening criteria. A detailed discussion of the Purpose and Need, screening criteria, and alternative evaluation is provided in Appendix B.

A. System Linkage and Route Importance

As mentioned, WIS 23 is part of the NHS, a Corridors 2030 Connector Route, and a long truck route. Not all alternatives are equally able to address the effects of trucks and other slow-moving vehicles on WIS 23 operations. On roadways of statewide importance, it is desirable, though not required by WisDOT, AASHTO,¹³ or FHWA standards, to have a consistent facility type between major highways and metropolitan centers. Questions that indicate how well an alternative addresses the System Linkage and Route Importance criterion include the following:

1. Does the alternative adequately address truck traffic needs?

To satisfy the long truck route designation component of the project Purpose and Need, the alternative should adequately address truck traffic needs. This includes addressing the WIS 23 operational challenges resulting from trucks and providing geometry that accommodates trucks.

2. Does the alternative provide system continuity?

As mentioned it is desirable to have a consistent facility type on WIS 23 between the US 151 4-lane expressway and the I-43 4-lane Interstate. To satisfy this criterion, alternatives should provide a reasonable level of consistency in facility type.

B. Transportation Demand and Regional Economic Development

The WIS 23 corridor was incorporated as a Connector into the Corridors 2030 state highway plan because of its multifaceted role. WIS 23 connects producers with markets and people to jobs and is an important link to recreational facilities in east central Wisconsin. Economics are a key factor in the designation of both Backbone and Connector Routes in Corridors 2030. Reducing travel times and providing predictable travel times decrease transportation costs for businesses and increase the attractiveness of the corridor and adjacent communities for business development. Providing easy and intuitive access also helps businesses that rely on tourists and recreational patrons. Questions that indicate how well an alternative addresses the Transportation Demand and Regional Economic Development criterion include the following:

1. Does the alternative reduce travel time?

This criterion is satisfied if the alternative reduces travel time and maintains travel speeds near the posted speed limit.

2. Does the alternative provide for more predictable travel?

This criterion is satisfied by maintaining satisfactory LOS consistently throughout the corridor and reducing the negative effect of slow-moving agricultural, truck, and recreational vehicle traffic. WIS 23's current lack of passing opportunities and available gaps in the opposing travel stream make passing

¹³ American Association of State Highway Officials.

slow-moving vehicles difficult. Reducing the negative effect of slow-moving traffic can be accomplished by providing opportunities to pass through passing lanes or capacity expansion.

C. Legislative and Transportation Planning History

In 1999, the Wisconsin State Legislature enumerated WIS 23 as a major project and authorized WisDOT to begin construction. The authorization is found in Wisconsin State Statute 84.013(3)(ra).¹⁴ With this authorization, the Wisconsin State Legislature did not use the Transportation Projects Commission Process described in State Statute 13.489 and directly enumerated the WIS 23 project. The enumeration of WIS 23 as a major project implies the adding of one or more travel lanes to WIS 23 for at least 5 miles. This action by the legislature illustrates WIS 23's regional and economic importance to the state. To qualify as a major project according to the previously referenced 84.013(1)(a), and comply with this enumeration, WIS 23 must add 5 or more lane miles to the corridor. The enumeration process does not supersede the National Environmental Policy Act (NEPA)/Wisconsin Environmental Policy Act (WEPA) process. Through the NEPA/WEPA process, lesser alternatives may be selected. If they are selected, the project would no longer qualify as a major project and would no longer be eligible for funding under the Wisconsin Majors program.

Questions that indicate how well an alternative addresses the Legislative and Transportation Planning criterion include the following:

1. Is the alternative consistent with and/or reflected in local land use and transportation plans?

To be consistent, alternatives that are evaluated should be reflected in or not contradict local land use and transportation plans.

2. Is the alternative consistent with the intent of Wisconsin State Statute 84.013(3)(ra)?

To be fully consistent with this state statute, the alternative must add "one or more lanes 5 miles or more in length to the existing highway."

D. Existing and Future Traffic Volumes and Resulting Operations

WIS 23 is a Connector Route in the *Corridors 2030* and *Connections 2030 Plans*. One of the main design requirements of a Corridors 2030 route is maintaining acceptable traffic operations. WisDOT's Facilities Development Manual (FDM) provides the operational goals for Corridors 2030 (formerly Corridors 2020) routes¹⁵. The FDM states "The highest LOS thresholds are applied to the Corridors 2020 system in recognition of its importance from a mobility and economic development perspective."¹⁶ For Corridors 2030 routes, the FDM LOS threshold is LOS C, which indicates the LOS on this route must be kept above the operational threshold between LOS C and LOS D (the numeric LOS <=4.0).

The FDM does not list LOS requirements for intersections associated with a Corridors 2030 route.¹⁷ While not required to establish an LOS threshold for side-road intersections on WIS 23, WisDOT seeks to provide reasonable operation levels at all intersections and WisDOT defines this as LOS D.¹⁸ Operation levels tend to deteriorate at more highly used intersections because there is a higher demand for access, which leads to queuing. Higher volume intersections along WIS 23 include county trunk highways that are classified either as minor arterials or rural collectors. Reasonable operational levels become more critical and more difficult to achieve at the highly used intersections of County G, County UU, and County W. Questions that indicate how well an alternative addresses this criterion include the following:

¹⁴ 84.013

(3) The department may proceed with construction of the following major highway projects:
(ra) STH 23 between STH 67 and USH 41 in Sheboygan and Fond du Lac counties.

¹⁵ FDM 11-5-3, Table 3.1

¹⁶ FDM 11-5-3.2

¹⁷ FDM 11-5-3.2 Table 3.1 lists the acceptable LOS for highways, yet the accompanying text states *Table 3.1 is not intended for use to determine appropriate LOS at controlled intersections. Intersection LOS will be determined on a case-by-case basis dependent on the local land use, economic, social and environmental impacts.*

¹⁸ Most municipalities, county, and state governments establish LOS D as an acceptable intersection operation level. As such, this LOS would be expected at higher use intersections along WIS 23 to ensure effective access.

1. Does the alternative improve WIS 23 mainline operational efficiency and mobility by meeting LOS requirements of a Corridors 2030 Connector Route?

To satisfy this criterion, an alternative must maintain LOS C or below numeric LOS 4.0 in the 2035 design year.

2. Does the alternative provide a reasonable LOS for vehicles trying to access WIS 23?

Alternatives that provide LOS D or better for side-road movements onto or across WIS 23 at the more highly used intersections of County G, County UU, and County W satisfy this criterion.

E. Highway Geometry

The cross-sectional requirements related to a Corridors 2030 route are directly related to their ability to satisfy the operational goals for the Design Class. WisDOT's Facilities Development Manual (FDM) describes Design Criteria by Design Class,¹⁹ which are divided into four categories: A1 (low volume 2-lane), A2 (moderate volume 2-lane), A3 (4-lane divided), and A4 (6-lane divided). For each Design Class, there are generic traffic volume guideline ranges that are used to provide the appropriate LOS expectations. The generic guidance for 4-lane expansion on a Corridors 2030 Connector route is 8,700 vehicles per day (vpd), or with passing lanes, 12,000 vpd. The actual threshold varies for each individual road based on what is necessary to maintain LOS C (or numeric LOS below 4.0). Individual roadway characteristics, such as peak-hour volume, directional distribution of traffic, lane and shoulder width, percent passing zone availability, access frequency, and truck percentage, all factor in the LOS calculation for WIS 23. Each design class has corresponding geometric characteristics including shoulder width, clear zone width, and horizontal and vertical roadway curvature. The following question indicates how well an alternative addresses the Highway Geometry criterion.

1. Does the alternative incorporate the appropriate design criteria for the roadway classification?

To satisfy this criterion an alternative should provide the number of lanes or passing opportunities to maintain adequate LOS as well as having appropriate shoulder widths, clear zones, and horizontal/vertical alignments.

F. Access Management

Access is one of the greatest factors affecting roadway safety. As traffic volumes increase, left turns from and to a sideroad/driveway, as well as crossing maneuvers, become more hazardous and pose risks to both mainline and side-road drivers. Because of the safety risks associated with access, WisDOT adopted a statewide policy for managing access on side roads. WIS 23 is a Tier 2A corridor in the State Access Management Plan (SAMP). Goals for Tier 2A corridors include maximizing interregional traffic movements. Most Tier 2A corridors are, or are planned for, 4 lanes. Also, expressway standards are highly desirable for Tier 2A corridors.²⁰

WIS 23 improvements should seek to remove hazardous access movements from the corridor through eliminating access points, installing grade-separated crossings, access combination, and other access management measures. Corridor preservation measures should also be considered that would officially map access modifications that cannot be implemented immediately. The following questions indicate how well an alternative satisfies this access criterion.

1. Does the alternative reduce the number of hazardous movements (left turns or crossing from side roads) at public access points through the installation of access restrictions or interchanges?

Alternatives that include geometric modifications that eliminate or relocate hazardous movements at intersections satisfy this criterion.

2. Does the alternative reduce the number of private access points through right of way acquisition?

Alternatives that eliminate or relocate access points satisfy this criterion.

¹⁹ Attachment 1.1 in the FDM 11-15.

²⁰ FDM 7-5-1 - Also, expressway standards are those associated with a high-speed, divided, four-lane highway.

3. Does the alternative designate and preserve land for future access modifications, such as overpasses and interchanges, through official mapping?

Alternatives that preserve land for future access modifications through the provisions associated with Wisconsin Statute 84.295 satisfy this criterion.

G. Improve Safety

While the overall corridor crash rate is slightly below the statewide average for a 2-lane rural highway, there are sections at both ends and at the center of the corridor that have higher crash **rates**.

With any road improvement, it is important to address safety deficiencies to reduce crash potential; this includes WIS 23. Safety improvements are often termed as countermeasures because they counter specific safety deficiencies. WisDOT always considers and incorporates countermeasures in highway improvements to address safety deficiencies. In recent years, there have been studies and guides published that allow a more quantitative approach to safety evaluation. These resources can be used to evaluate the potential effectiveness of safety improvements. The following questions indicate how well an alternative addresses the safety criterion.

1. Does the alternative adequately address WIS 23 mainline safety?

Alternatives that provide countermeasures that directly address the types of crashes occurring on the WIS 23 corridor satisfy this criterion.

2. Does the alternative address intersection safety?

Alternatives that provide countermeasures that directly address the types of crashes occurring on WIS 23 intersections satisfy this criterion.

H. Accommodations for Nonmotorized Travel

As previously mentioned, there is a gap in bicycle and pedestrian accommodations between the Old Plank Road Trail that ends in Greenbush and the Prairie Trail that travels around the perimeter of Fond du Lac. WIS 23 improvements should seek to address this gap. The following question indicates how well an alternative addresses this criterion.

1. Does the alternative provide accommodations for nonmotorized travel?

Alternatives that provide a separate path or on-highway accommodations satisfy this criterion.