

US Highway 12 Corridor Study Report

Project ID 1670-10-09
Baraboo – Madison
(Ski Hi Road to WIS 19 West)
US 12
Sauk & Dane Counties

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Wisconsin Department of Transportation
Southwest Region



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1.0 INTRODUCTION

This report presents the results of an evaluation of the existing US 12 corridor from Ski Hi Road in Sauk County to STH 19 West in Dane County. See Exhibit 1 – Project Location Map.

Other WisDOT Projects

There are additional projects adjacent to this corridor that will also address capacity, safety and access control.

- Project I.D. 1674-00-02, IH 90/94 to Ski Hi Road, (Terrytown Road—Ski Hi Road)-South Section, US 12, Sauk County, will reconstruct a portion of US 12 north of this project. The southerly portion will be constructed to expressway standards while the northerly portion to freeway standards. Work is scheduled to begin in 2015.
- Project I.D. 5300-05-00, STH 19 West – Middleton, US 12, Dane County, is a Freeway conversion study. Work is scheduled to begin in 2015.
- Project I.D. 1670-01-75, WIS 60 and US 12, Sauk County, is a Highway Safety Improvement Program project intended to improve safety at this intersection. Construction is scheduled to begin in 2015.
- Project I.D. 1670-02-74, Lueders Road to John Adams Street, US 12 (Phillips Blvd.), Sauk County, was reconstructed in 2013.
- Project I.D. 1670-02-77, CTH C to Waterbury Road, US 12, Sauk County, will re-align the S-curves south of the Badger Army Ammunition Plant in 2018.

2.0 PROJECT BACKGROUND

2.1 Study Location

The US 12 study corridor begins at Ski Hi Road in Sauk County and continues south to STH 19 West in Dane County. The project is approximately 22 miles in length. The project is broken down into 2 sections: North Section (Ski Hi Road—STH 78 South) and the South Section (STH 78 South to STH 19 West). The North section passes through the Townships of Sumpter and Prairie du Sac and the Village of Sauk City. The South section passes through the Townships of Roxbury, Dane and Springfield.

2.2 Study Purpose

North Section

The purpose of this segment of study is to provide a detailed analysis of the capacity and operational needs on the US 12 corridor from south of the City of Baraboo through Sauk City. The limits of this segment of study are narrowly restricted to the existing cross sections and rights-of-way of US 12. Until such time that the Wisconsin Legislature, through the Transportation Projects Commission (TPC), approves a specific expansion study within the Major Highway Sub-Program, the Department can only study this corridor as prescribed above. More information on WisDOT's Major Highway Sub-program and the TPC, can be found at the main WisDOT Weblink: <http://www.dot.state.wi.us/projects/state/sixyear/major.htm>

It is acknowledged that local units of government have conducted extensive planning exercises to prepare their communities for an expanded US 12. Even though this level of detail is beyond the scope of this study, these plans shall be consulted by the Department prior to implementing any recommended treatments found in this study.

This 13-mile section of US 12 varies between a two-lane rural roadway and a 4-lane rural roadway, with a short 4-lane urban section in the City of Sauk City. All intersections are at-grade. Growing traffic volumes and land development are driving the need to consider long-range alternatives for the corridor to ensure a safe and efficient roadway that will function within the existing-cross section for as long as possible. This study will review locations along the corridor for safety and operational issues and develop potential solutions. The study will also involve examining at-grade access points to determine how to meet access needs that will preserve the safety and functionality of the highway for future years.

South Section

The purpose of this segment of the study is to provide possible alternatives for the conversion of US 12 to a freeway. The plan will involve looking at existing at-grade access points to determine how to meet access needs in a manner that will preserve the safety and functionality of the highway for the long term. The 9-mile segment of US 12 is a 4-lane divided roadway with at-grade intersections. Once again, growing traffic volumes and land development are driving the need to consider long-range alternatives for the corridor to ensure a safe and efficient roadway.

2.3 Route Significance

US 12 is a principal arterial highway. It is significant for the following reasons:

- Part of the National Highway System
- Connector in WisDOT's Connections 2030
- Connects west side of Madison to Wisconsin Dells
- Alternative route for IH 94/90/39
- Areas north of the corridor are developing
- Carries significant regional truck and automobile traffic
- Commuter route Madison—Wisconsin Dells

3.0 TRAFFIC OPERATIONS AND CRASHES

Traffic operations and crashes were analyzed at representative intersections and along the corridor. The goal was to identify locations with unsafe or inefficient operations along the corridor. See Exhibit 2—Traffic Operations and Crash Diagrams.

3.1 Traffic Operations—Intersections

Five un-signalized intersections along US 12 were analyzed. 2010 existing conditions and 2041 No-Build volumes for the AM and PM peak hours were used. The following is a summary of the intersection levels of service (LOS). The worst period of the day is shown.

North Section

STH 60	2010—LOS D	2041—LOS F
Sauk Prairie Road	2010—LOS C	2041—LOS F
CTH Z	2010—LOS D	2041—LOS F

South Section

CTH KP	2010—LOS C	2041—LOS E
CTH Y	2010—LOS C	2041—LOS E

3.1.1 Traffic Operations Deficiencies

North Section

Levels of service for the representative intersections are reaching the lower limit of acceptability in the existing condition and will fail in the design year. Poor LOS on the side roads is causing the overall lower intersection LOS.

South Section

Levels of service for the representative intersections are acceptable in the existing condition and deteriorate in the design year. Again, poor LOS on the side roads is causing the overall lower intersection LOS in the future.

3.2 Traffic Operations—Non-Intersections

Corridor operations for peak hours were modeled for 2010 for the existing condition and 2030 for a future condition. See Exhibit 2—Traffic Operations and Crash Diagrams. In general, the operations along the corridor are summarized below.

Section

Ski Hi to CTH Z (rural)	2010—LOS A	2030—LOS A
CTH Z to Lueders Road (rural/transitional)	2010—LOS D	2030—LOS D→E
Lueders Road to STH 78 (urban)	2010—LOS B→E	2030—LOS B→F
STH 78 to STH 19 (rural)	2010—LOS A	2030—LOS A→B

3.2.1 Traffic Operations Deficiencies

Levels of service for rural sections of the corridor remain at very functional levels for the foreseeable future. Urban/transitional sections will experience deteriorating conditions over time. This is an expected outcome.

3.3 Crashes—Intersections

Crashes were analyzed at 9 intersections with US 12 for the period between 2005 and 2009. A summary of the crashes is provided below.

North Section

Table 1 – Crash Summary-North Section

Intersection	Volume Veh./Day	Rate Per/Million Entering Veh.	NO. Crashes	TYPE		
				Property Damage	Injury	Fatality
CTH Z	11,900	0.28	6	3	3	0
STH 60	13,700	0.32	8	5	3	0
Madison Street	17,400	0.70	22	18	4	0
Water Street	21,100	0.81	31	22	9	0

CTH PF was signalized in 2007. The following expanded crash data applies to the before and after signalized condition of the intersection.

Unsignalized analysis (2005-2007)

- 21 crashes
- 7 crashes per year
- 1.69 crashes per million entering vehicles (MEV)
- 0.88 injury crashes per MEV

Signalized analysis (2008-2012)

- 17 crashes
- 3.2 crashes per year (54% reduction)
- 0.66 crashes per MEV (61% reduction)
- 0.27 injury crashes per MEV (54% reduction)

South Section

Table 2 – Crash Summary-South Section

Intersection	Volume Veh./Day	Rate Per/Million Entering Veh.	NO. Crashes	TYPE		
				Property Damage	Injury	Fatality
STH 188	14,700	0.45	12	4	8	0
CTH Y	14,500	0.30	8	3	5	0
CTH KP	14,200	0.19	4	1	2	1
STH 19 West	13,500	0.32	8	4	4	0

3.3.1 Crash Rates—Intersections

An intersection that has a crash rate that approaches or exceeds 1.50 is typically flagged as one that needs improvements. None of the intersections analyzed are of concern using this criteria. However, two intersections were further evaluated:

- The signalization of the CTH PF intersection shows a significant reduction in the number and severity of crashes. Turn lane tapers are too abrupt.
- The functional area of the STH 60 intersection has a crash rate of 1.25 per million entering vehicles. This has prompted a Highway Safety Improvement Program (HSIP) project.

As congestion increases, the potential for crash occurrences may also increase.

See Exhibit 2 for Crash Maps of each of the intersections that were evaluated.

3.4 Crashes—Non-Intersections

Crashes were analyzed along the corridor from 2004 to 2008. WisDOT staff prepared the *Corridor Segment Crash Report*. See Exhibit 11 for this report. Maps showing approximate crash locations are shown in Exhibit 2. A general summary of the results are as follows:

Table 3 – Non-Intersection Crash Rates, Crash Types and Crash Spots

Section	Crash Rate*	State Ave.*	No. Crashes	Type			Property Damage w/o Alcohol	Crash Spot
				Injury	Fatal	Alcohol		
A (Ski Hi – CTH Z)	71	59	114	58	3	11	42	3.42
B (CTH Z – Lueders Road)	69	87	49	38	1	6	4	1.80
C (Lueders – STH 60)	201	244	53	12	0	1	40	1.13
D (STH 60 – STH 19 W)	23	59	47	16	0	4	27	1.10

*5 year rate per 100 million vehicles entering

3.4.1 Crash Rates—Non-Intersections

Section A exceeds the state crash rate average. All sections have crash spot issues, but sections A & B have the most significant problems. Problem areas have been identified as being in the S-curves south of the Badger Army Ammunition Plant (BAAP), 2 – 4 lane transition areas, and the King's Corner hill. The crash rate for this segment is 114/million vehicle miles (mvm) which is nearly twice as great than the state average of 55/mvm for this type of facility. A project in the S-curves has been initiated to address the safety issues. Conceptual plans are included in Exhibit 14. As congestion increases, the potential for crash occurrences may also increase.

4.0 TYPICAL SECTION

The typical sections for US 12 were evaluated differently based on the study objectives of the particular section. See Exhibit 3—Traffic Forecasts & Exhibit 4—Typical Sections.

North Section

- Functional Classification: rural expressway arterial & urban arterial
- Design Speed = 60 mph
- Posted Speed = 55 mph
- Average Annual Daily Traffic Volumes (AADT – see Table 4 below) provided by WisDOT.
- Truck Volumes are estimated at 5.3%, and 5.0% T (DHV) provided by WisDOT.

South Section

- Functional Classification: rural freeway arterial
- Design Speed = 70 mph
- Posted Speed = 55 mph
- Average Annual Daily Traffic Volumes (AADT – see Table 4 below) provided by WisDOT.
- Truck Volumes are estimated at 5.3%, and 5.0% T (DHV) provided by WisDOT.

4.1 Summary

Traffic forecasting assigned this section of US 12 a Group VI classification which indicates higher seasonal fluctuation in peak volumes. Some Friday PM peaking is anticipated similar to IH 90/94, but Sunday PM is not as prevalent. Route is known to be heavily congested during summer holidays. Tables 4 and 5 below summarize the design characteristics of the US 12 typical sections.

Table 4 – Traffic Volumes and Design Class

Section	Average Annual Daily Traffic (AADT)		Design Class for the Design Year
	Existing Year (2009)	Design Year (2041)	
North	14,200	20,800	A3 – 4 lane divided
South	16,300	23,600	A3 – 4 lane divided

**Table 5 – Typical Section Design Requirements
(from FDM 11-15, Attachments 1.1→1.4 & 1.7)**

Section	Traveled Way Width (# of lanes @ total width)	Shoulder Width (Paved)	Median Width*	Roadway Width (total width each direction)	Clear Zone
North	2 @ 24'	LT: 4' (6') RT: 10' (10')	60'	40'	36'
South	2 @ 24'	LT: 4' (6') RT: 10' (10')	60'	40'	30'

*median widths at un-signalized intersections may require widths up to 100' to accommodate larger vehicles or farm machinery

4.1.1 Typical Section Deficiencies

See Exhibit 5—Geometric Evaluation & Deficiency Maps for all geometric deficiencies identified in this report.

North Section

- Paved width of the shoulders is substandard in several locations.
- Outside shoulder width is substandard in several locations.
- Median width in all divided sections is substandard (~7.1 miles).
- Clear zone is substandard in several locations.

Traffic forecasts indicate an expanded facility may be necessary in the future. Volumes are not the sole criteria to trigger expansion. Levels of Service (LOS), crash history and access

control also play significant roles in determining if a highway section warrants an expansion. Please see these sections of the study for further discussion.

South Section

- Paved width of the shoulders is substandard in several locations.
- Median width in several areas is substandard (~2.1 miles).
- Clear zone is substandard in one area (~0.3 mile).
- This section was recently reconstructed to expressway standards (2002-2004).

5.0 HORIZONTAL ALIGNMENT

5.1 Curve Radius / Superelevation

Standards for the US 12 horizontal alignment were evaluated based on the appropriate design speed and a 6% maximum superelevation rate (FDM 11-10, Exhibit 5.1).

North Section

The alignment is made up of 19 horizontal curves. Curves are superelevated with a maximum rate of 8%.

South Section

The alignment is made up of 14 horizontal curves. Curves are superelevated with a maximum rate of 6.0 %.

5.1.1 Curve Radius / Superelevation Deficiencies

North Section

Three curves are superelevated at 8% which is no longer a desirable rate. These curves also have substandard radii to accommodate neither the 8% nor the 6% superelevation. Five additional curves exceed the 6% desirable rate, but have acceptable radii to accommodate the existing rate.

South Section

Seven of the curves have slightly less than desirable superelevation rates. These rates are within 3% of the standard and not considered deficient.

6.0 VERTICAL ALIGNMENT

6.1 Tangent Grades

Standards for the US 12 vertical alignment were evaluated based a maximum allowable grade of 4.0% for the North Section—rolling terrain, and 3.0% for the South Section—level terrain (FDM 11-10, Attachment 5.3).

North Section

Tangent grades range from 0.24% to 6.25%.

South Section

Tangent grades range from 0.50% to 4.03%.

6.1.1 Deficient Tangent Grade

North Section

Grades exceeding 4% are found in the section of US 12 that traverses the Baraboo Hills. To correct this deficient element, large impacts to the surrounding natural area would result.

South Section

Several areas exceed a grade of 3.0%, for a distance of approximately 1.0 mile. Grades of 4.03% are within 0.5% of the standard and are not considered deficient.

6.2 Stopping Sight and Decision Sight Distances

Stopping Sight Distances (SSD) and Decision Sight Distances (DSD) were evaluated by determining the K value of individual vertical curves. Proximity to critical decision making locations along the corridor determined the category (1, 2 or 3) to compare each curve to. The design speed of the curves are then determined (FDM 11-10, Attachment 5.4 & 5.6). In all cases, desirable standards were used as the base criterion.

North Section

See Exhibit 5 for geometric evaluation and deficiency maps.
Design speeds vary from 25 to 70 mph.

South Section

See Exhibit 5 for geometric evaluation and deficiency maps.
Design speeds vary from 40 to 70 mph.

6.2.1 Deficient Stopping Sight and Decision Sight Distances

More comprehensive standards are now in place to evaluate these elements than when the corridor was constructed. It is assumed previous projects designed segments of US 12 to the most current standards available. The change in standards is likely the driving force in the deficient classification of many of the vertical curves.

North Section

Many areas of substandard curves exist, but only one location has been identified as having a crash rate that warrants reconstruction at this time. This location is the S-curves near the BAAP. As previously noted, the crash rate for this segment is nearly twice as great as the state average for this type of facility.

South Section

The crest vertical curve at the STH 188/Tetiva Road intersection with US 12 is rated at 50 mph. The clustering of crashes in the northbound lanes may indicate drivers on US 12 inability to stop to avoid vehicles in the intersection. Posted speeds through the intersection are 45 mph in eastbound direction and 55 mph in westbound direction.

7.0 STRUCTURES

7.1 Physical Structure Condition, Clearance and Width

WisDOT provided structure analysis and inspection reports for the corridor. The information is presented in Table 6. All structures meet the standards for Sufficiency Rating, Inventory Load Rating, Operating Load Rating, and roadway width. All structures are located in the South Section.

Table 6 – Structure Physical Conditions

Structure Number	Structure Location	Sufficiency ¹ Rating	Inventory / Operating Load ²	Vertical Clearance in Feet ³	Roadway Width ⁴
B-13-520	EB US 12 over Roxbury Creek	99.7	HS 22 / HS 49	N/A	40'
B-13-521	WB US 12 over Roxbury Creek	99.7	HS 22 / HS 49	N/A	40'
B-13-522	Ice Age Trail over US 12	N/A	PEDESTRIAN	19.98'	N/A

¹If < 80 eligible for rehabilitation funding, if < 50 eligible for replacement funding

²Inventory and Operating Loads should be > HS 10.

³Minimum vertical clearance standard from FDM 11-35-1, Attachment 1.9

16' over a freeway or expressway

15.25' for freeway, expressway, or STH over non-arterial roadway at interchange

14' for freeway, expressway, or STH over non-arterial roadway at grade separation

⁴US 12 - Desirable = roadway + shoulder width = 40'

8.0 ACCESS CONTROL

8.1 Access Control Summary

Access along US 12 is well controlled by WisDOT. Control of local roads varies, dependent upon local municipalities' policies.

This portion of US 12 falls under the State Access Management Plan (SAMP) which is part of the Connections 2030 statewide long-range multimodal transportation plan. Roadways in this plan are designated in a specific Tier and the plan assigns access control guidelines for each Tier. See Exhibit 6—Access Management for mapping.

North Section

The SAMP has designated the roadway segment from Lueders Road to the Wisconsin River in the City of Sauk City as Tier 3 and the segment from the Wisconsin River to STH 78 as Tier 2A. The remainder of the section is designated as Tier 1.

US 12 from CTH W to Lueders Road is a controlled access highway. US 12 within Sauk City, has all access to US 12 approved by WisDOT.

South Section

This entire section is designated as Tier 1 on the SAMP.

US 12, from Sauk City to west of CTH Y, is controlled under Plat of Right-of-Way ID 5300-03-25. US 12 from west of CTH Y to the City of Middleton, is controlled under Controlled Access Project Number 5300-01-29 (84.25 map).

The following table illustrates type of controls that should be followed for new requests for access points.

Table 7 – Guideline for New Access Points (FDM 7-5 Table 1.1)

TIER	Goal is to maximize movements of:	Allowable New Access
1	Statewide traffic	Grade separations
2A	Interregional traffic-high volume	At-grade intersections, widely spaced driveways
3	Regional/Intra-urban traffic	At-grade intersections, more closely spaced driveways

Opportunities to bring sections of roadway into conformance with its Tier guidelines should be identified and implemented when reasonably feasible.

A jurisdictional transfer agreement between WisDOT and the Town of Springfield was executed in 2006.

A jurisdictional transfer agreement between WisDOT and the Town of Roxbury has been drafted but not executed.

8.2 Access Control Deficiencies

The numerous access points in the urban and rural areas of US 12 are being reviewed for opportunities to consolidate or remove.

North Section

The Sauk City section is built to Tier 3 guidelines. It has some safety and operational issues that are slowing being addressed. Several access points have been consolidated during reconstruction of US 12 from Lueders Road to John Adams Street in 2013. The Tier 2A section from the Wisconsin River to STH 78, was rebuilt in the mid-2000's to 4-lane divided section. Access points were limited and consolidated where practical. The section from Ski Hi to Sauk City limits needs to be brought up to Tier 1 standards. Since nearly half of this section still remains a 2-lane facility and there are no long term plans to change this, the only option is to limit new access points to US 12. This will make future removals less disruptive. One location of specific concern is the Bluffview Meadows neighborhood across from the BAAP. It has 4 full access points to US 12 within 3/4 mile. There are no access points causing safety or operational problems at this time.

WisDOT acknowledges that the 2005 Sauk Prairie Comprehensive Plan includes a local road infrastructure between STH 60 and Lueders Road. It proposes three new intersecting road

locations along with a parallel local road network. Since WisDOT approves all access points to US 12, the communities and/or developers will need to coordinate closely with WisDOT for any future public and private roadways and driveway proposals as shown in the Sauk Prairie Comprehensive Plan and other locations as they arise. The coordination will include specific traffic impact analysis documentation through formal WisDOT processes. An endorsement of the proposed locations is beyond the scope of this study.

South Section

This section was rebuilt in the mid-2000's to 4-lane divided expressway section. Access points were limited and consolidated where practical. The section needs to be brought up to Tier 1 standards. No new requests for access points to US 12 should be allowed. This will make future removals less disruptive. There are no access points causing safety or operational problems at this time.

9.0 ENVIRONMENTAL

9.1 Screening Summary of Resources

A study zone of 0.25 mile from each side of US 12 was used to determine what resources are present. Information from the WisDNR, DATCP, Dane and Sauk Counties and a Cultural Resource Assessment by Commonwealth Cultural Resources Group were used to compile this data. See Exhibit 7—Environmental Screening Location Map & Exhibit 8—Cultural Resource Assessment Maps. An "Agriculture Operations Survey" was sent to agricultural landowners in January 2012 and individual interviews were conducted in June and August 2012. A summary report has been written and is attached as Exhibit 9.

9.1.1 Agricultural Lands

North Section (Sauk County)

Most of the parcels are zoned agricultural in the study area. Surveys were sent to 53 agriculturally zoned parcels. 21 respondents provided information on their farm operations. 4 farm operations were also personally interviewed. The following are general comments from both sources; please see Exhibit 9 for a full summary.

- The majority of farms are crop/produce producing in nature.
- For more than half of the respondents, US 12 is their only access point.
- Two-thirds of trips on US 12 are to access fields and for transport of farm goods/supplies.
- Access needs to US 12 are highly variable throughout the year.
- US 12 is a busy road and is avoided if possible.
- 2-4 lane transitions seem to lack adequate deceleration/acceleration areas.
- Northbound left turning movements are difficult.
- Any potential roadway improvement needs to maintain existing farm operations/supplementary businesses to greatest extent possible.

South Section (Dane County)

Most of the parcels are zoned agricultural in the study zone. Surveys were sent to 48 agricultural parcels. Twenty-one (21) respondents provided information on their farm operations; six farm operations were also personally interviewed. The following are general comments from both sources; please see Exhibit 9 for a full summary.

- Half the farms are dairy/cattle in nature and the other half produce crops/produce.

- Similarly, for more than half of the respondents, US 12 is their only access point, with two-thirds of the farms divided by US 12.
- One half of trips on US 12 are to access fields and for transport of farm goods/supplies.
- Access needs to US 12 are highly variable throughout the year.
- Farm owners do not want to lose any additional land or cause drainage problems.
- Any further limiting of access to US 12 will make reaching non-contiguous parcels much more difficult.
- The expressway has made travel on US 12 safer for farm operations and traveling public, but time on US 12 is minimized.

The results of the survey show that US 12 is an important resource for the agricultural community.

9.1.2 4(f) & 6(f) Properties

North Section

No parcels have been identified in the study corridor.

South Section

No parcels have been identified in the study corridor.

9.1.3 Historic & Archaeological Surveys

North Section

18 sites have been identified on the Wisconsin Architecture and History Inventory (AHI).
35 sites have been identified on the Wisconsin Archaeological Site Inventory (ASI).

South Section

38 sites have been identified on the Wisconsin Architecture and History Inventory (AHI).
45 sites have been identified on the Wisconsin Archaeological Site Inventory (ASI).

9.1.4 Hazardous Materials/Contamination Assessments

North Section

11 sites have been identified as having the potential for containing hazardous materials or contamination of one type or another.

South Section

1 site has been identified as having the potential for containing hazardous materials or contamination of one type or another.

9.1.5 Wetland Identification & Impact Analysis

North Section

Several sites have been identified as having wetlands present.

South Section

Several sites have been identified as having wetlands present.

9.1.6 Protected Species Inventory

Local comprehensive plans were reviewed with most noting some level of existence of either aquatic or terrestrial protected species within their study area. The Wisconsin Department of Natural Resources Natural Heritage Inventory (NHI) program is the source for these determinations.

North Section

Plant, animal and aquatic species have been identified along most of the US 12 corridor in this section. Particular areas of note are along the Wisconsin River, where bald eagles are located and the Baraboo Range, where many plant and animal populations exist.

South Section

Aquatic and terrestrial protected species have been identified along the US 12 corridor in sections 7, 18 & 19 in the Town of Roxbury (northwest corner). Bald eagles are also present along the Dane County side of the Wisconsin River.

10.0 UTILITIES

10.1 Summary of Facilities

Below is a listing of potential utilities along the study corridor. Coordination will continue to identify utility corridors within the project.

- Alliant Energy – Electricity & Gas/Petroleum
- ATC Management, Inc. – Electricity
- TDS Telecom – Communication Line
- CenturyLink – Communication Line
- Madison Gas and Electric Company – Electricity Gas/Petroleum
- Merrimac Communications Ltd – Communication Line
- Northern Natural Gas Company – Gas/Petroleum
- Roxbury Sanitary District #1 – Sewer
- Sauk City Municipal Water & Light Utility – Water
- Sauk County Emergency Management Buildings & Safety – Communication Tower
- TDS Telecom – Communication Line
- Bluffview Sanitary District – Sewer
- Charter Communications – Communication Line
- McLeod USA Telecommunication Services Inc – Communication Line
- Mid-Plains Telephone LLC – Communication Line
- Prairie Du Sac Municipal Electric & Water – Electricity
- Sauk City Municipal Water & Light Utility – Electricity
- Sauk County Emergency Management Buildings & Safety – Communication Line
- Verizon Communications – Communication Line

11.0 LOCAL OFFICIALS & PUBLIC INVOLVEMENT

11.1 Local Officials

Meetings were held with the 3 governing bodies (Sauk County, Dane County and Sauk City) the study passes through. Meetings were conducted in February of 2012. General comments are summarized below.

Sauk County (North Section)

- ❖ Conversion of existing railroad into bicycle trail from Sauk City to BAAP is desired.
- ❖ Can “Jake Braking” along STH 60 be regulated?
- ❖ 2-4 lane transitions are problematic for near misses and aggressive driving.
- ❖ S-curves south of BAAP can be problematic due to excessive speed and side-road access points within the curves.
- ❖ CTH PF intersection can be confusing to some with regard to proper lane usage.

Sauk City (North Section)

- ❖ Does traffic forecasting account for variability due to tourism traffic on corridor?
- ❖ Sauk Prairie Road will experience increased traffic volumes due to planned development in area.

Dane County (South Section)

- ❖ Agricultural access is important.
- ❖ Look at connecting shared-use path from Dunlap Hollow Road to Rauls Road.
- ❖ Snowmobile and EMS impacts from a freeway conversion should be evaluated.
- ❖ Coordinate with Parks & Maintenance on any concerns they may have.

Local Officials were provided copies of this study in August 2013 to solicit comments on the findings and recommendations. General comments are summarized below.

Sauk County (North Section)

No further comments.

Town of Prairie du Sac, Village of Prairie du Sac, Village of Sauk County (North Section)

- ❖ Study does not adequately consider locals plans and desires for a Highway 12 Bypass.
- ❖ What are the crash rates at the US 12/CTH PF intersection since the reconstruction and signal installation?
- ❖ Study does not consider the impacts from hospital campus near US 12/CTH PF intersection to Sauk Prairie Road and CTH PF intersections.
- ❖ Will the signals be timed between Lueders Road and Water Street?
- ❖ Study does not discuss how traffic forecasts that predict the need for a 4-lane section will be addressed.

Dane County (South Section)

No further comments.

11.2 Public Involvement

The first Public Involvement Meeting (PIM) was held April 23, 2012. A summary of the project goals and information gathered to date was presented.

General comments are summarized below.

North Section

- Concerns regarding impacts to businesses from improvements (roundabouts and overpass) to US 12 near CTH PF, as proposed by Sauk Prairie future development plans.

- Where is the Sauk City Bypass going?
- Relocate median opening to line up driveways so u-turns on US 12 not required.
- Remove the northerly access point to US 12 at Bluffview (across from BAAP).
- Turn lanes at the CTH PF intersection are too abrupt and do not have enough advanced notice.
- The signal green time for CTH PF traffic is too short.
- Lighting is inadequate at CTH PF intersection.
- Construct bike path from STH 60 to Sauk City.
- Concerns with drainage impacts from improvements to STH 60 intersection.
- Improve STH 60 intersection with lighting and turn lanes or roundabout.
- Improve merge condition for northbound traffic at CTH Z northbound intersection.

South Section

- Expansion of US 12 has been an improvement to safety for farm vehicles traveling on the roadway.
- Interchange at CTH KP would make access to fields along US 12 impossible.
- Improper lane usage at non-signalized intersections. Cars are doubling up in the median before making a turn. Additional pavement marking or signing might be helpful.
- CTH Y/US 12 intersection has many near misses for vehicles crossing US 12. Drivers have a hard time judging how fast US 12 traffic is going. There might be a slight crest curve south of the intersection that might be prohibiting adequate sight distance.
- Can acceleration lanes be provided at intersections to US 12, for example at STH 188?
- Will snowmobile underpass be maintained in future conversion?
- Make connections to bike paths coming from Madison to Sauk City.

12.0 LOCAL COMPREHENSIVE PLAN REVIEW

The comprehensive plans of the city and townships the project crosses were reviewed to insure alternatives or recommendations were consistent with these approved plans. See Exhibit 10—Existing and Future Land Use Plans for mapping.

Table 8 – Locally Adopted Plans

COMMUNITY	COMPREHENSIVE PLAN NAME
Sauk County	A Comprehensive Plan for Organizations, Businesses, and Government in Sauk County, December 2009
Sauk County	Sauk County Highway 12 Corridor Growth Management Plan, October 2003
Village of Prairie du Sac, Village of Sauk City & Town of Prairie du Sac	Sauk Prairie Comprehensive Plan, November 2005, Amended February 2012
Village of Prairie du Sac, Town of Prairie du Sac, Village of Sauk City	Highway 12/PF/Airport Area Plan, June 2012

COMMUNITY	COMPREHENSIVE PLAN NAME
Town of Sumpter	Town of Sumpter Comprehensive Plan, February 2003
Town of Roxbury	Town of Roxbury Comprehensive Plan, April 2012
Town of Springfield	Town of Springfield Comprehensive Plan, May 2002, Revised March 2007
Village of Prairie du Sac, Town of Prairie du Sac, Village of Sauk City	Long-Range US Highway 12 Alternatives Study for the Sauk Prairie Area, June 2004

The Department acknowledges the proposed Sauk Prairie Memorial Hospital campus (Highway 12/PF/Airport Area Plan) and has worked on access concepts with the communities. WisDOT has approved a secondary “Right-In” access to the proposed campus from US 12, with its primary access coming from CTH PF. The endorsement of an interchange and an expansion of US 12 in this area is beyond the scope of this study.

Impacts to the County PF and Sauk Prairie Road intersections due to this hospital campus was detailed in a Traffic Impact Study entitled “Sauk Prairie Memorial Hospital & Clinics Development”, November 11, 2011. Without any improvements to the existing geometrics, these intersections are expected to operate at a Level of Service of D or better through the full build-out, which is expected in the year 2024. The eastbound movement at Sauk Prairie Road will operate at a LOS E (evening peak hour), but a low volume/capacity ratio indicates sufficient capacity to accommodate projected traffic volumes without improvements.

13.0 MULTI-MODAL/RECREATIONAL FACILITIES

13.1 Bike/Pedestrian

See Exhibit 12—Bicycle Maps for WisDOT maps by county.

North Section

No off-road facilities exist near the study corridor. The majority of the section of US 12 (8.2 miles) is considered High Volume, Undesirable for on-road use. The segment from CTH C to CTH Z (3.4 miles) is more desirable because of wider paved shoulders, but it is still a high volume roadway.

South Section

An off-road, multi-use path (Dane County Highway 12 Path) begins in Sauk City and proceeds south 1.8 miles to Dunlap Hollow Road. It restarts 6.5 miles south, near Rauls Road, and proceeds towards Middleton. For on-road use, US 12 is considered High Volume, Undesirable from Sauk City to Breunig Road (5.5 miles). The segment from Breunig Road to STH 19 West (3.6 miles) is more desirable because of wider paved shoulders, but it is still a high volume roadway.

13.2 Snowmobile

North Section

One county trail crosses US 12 between CTH Z and CTH PF. No known safety or operational issues exist at this crossing.

South Section

State corridor trail #21 crosses US 12 near CTH KP. This trail also parallels US 12 on the north side near STH 188 before continuing along STH 188. The White Lightning club trail crosses US 12 between STH 78 and STH 188. No known safety or operational issues exist at these crossings or where the trail is adjacent to US 12.

14.0 STRATEGIES & RECOMMENDATIONS/ACCESS MANAGEMENT PLAN

The following recommendations are subject to approval by WisDOT. Some will require additional investigation. Locally adopted plans shall be reviewed to ensure conformity to established community goals and objectives.

14.1 Ski Hi Road—Lueders Road

Deficiencies noted in this section of USH 12 include:

- LOS D→F in 2030 (CTH Z to Leuders Road)
- Lack of bicycle facilities in corridor
- Crash rate above state average (Ski Hi to CTH Z)
- HSIP project at STH 60 intersection and WisDOT project at BAAP
- Possible crash issue at CTH PF

14.1.1 Transportation System Management (TSM) Alternative

The goal of the TSM alternative is to improve safety and traffic operations while maximizing the use of the existing infrastructure. Addition or the extension of turn lanes, removal of access points, improved signing and marking, and improved signal operations are general solutions as part of this alternative.

14.1.2 Two-Lane Roadway between Lueders Road and CTH Z

This section of US 12 has a high potential for future development and local communities have done extensive planning to address this. The Sauk Prairie Comprehensive Plan (as amended February 2012) is the planning document that consolidates this effort. Local preference is to relocate and expand US 12 south of its current route as it crosses the Wisconsin River while rejoining the existing alignment at STH 60 on the west and STH 78/188 on the east. An expanded US 12 will continue north from STH 60 towards the BAAP. Interchanges are proposed to be studied at STH 60 and CTH PF. The following recommendations are limited to the existing footprint of US 12, so they would only serve as short term solutions until an expanded and relocated US 12 is studied, designed and constructed. It is acknowledged that significant business and residential development is planned along the eastern and northern rights-of way of US 12 and these must be accounted for during implementation of any of the recommendations found in this study. It is anticipated that the potential intersection improvements included in this study will decrease delay. Alternative designs including roundabouts or divided sections with J-turns, etc., should be evaluated if an improvement

project is initiated. The scope of this study is not intended to choose the intersection type, but to provide a conceptual alternative that addresses the safety and mobility needs at a location within the corridor.

Access to US 12 is controlled by WisDOT. Proposed local road connections will need formal studies carried out to show no decline in safety or operations will occur because of the new access points. WisDOT has and will work with the local communities to provide appropriate access points within the corridor. An endorsement of the proposed locations is beyond the scope of this study.

CTH PF

The left turn lane southbound at the US 12 and County PF intersection has been identified as a concern. The taper is too abrupt for traffic at posted speed. The taper can be extended to make this merge less abrupt. This would shorten the stacking area for left turns at the intersection. Two options have been developed to address the taper issue. See Exhibit 15—CTH Z, CTH PF, Sauk Prairie Road & Bluffview Meadows TSM Alternatives.

Sauk Prairie Road

The Sauk Prairie Road intersection was analyzed for 2041 traffic volumes in its existing condition and the eastbound movements at AM and PM peak hours and the westbound in the PM peak hour experience significant delay. Separated left turn lanes should be provided at the Sauk Prairie Road intersection. This roadway will provide access to the future hospital development and is located at the bottom of vertical curve. A preliminary intersection layout has been developed. The proposed improvements to Sauk Prairie Road are similar to the current County PF intersection and follow FDM guidelines for the intersection type and traffic volume. See Exhibit 15—CTH Z, CTH PF, Sauk Prairie Road & Bluffview Meadows TSM Alternatives.

STH 60

A Highway Safety Improvement Program project, ID 1650-01-05, has been initiated to reconfigure the intersection. Proposed work will add concrete medians on US 12 that will provide protected left turns from US 12. Consolidation or restricting movements of private entrances is also included. It predicted that these improvements will reduce crashes by approximately 57%. Project is scheduled for 2015 construction. See Exhibit 14—HSIP & Other Projects for preliminary layout information.

14.1.3 Four-Lane Roadway between CTH Z & Ski Hi Road

Access Restrictions

The sideroad intersections at Groth Road, North Road, Armory View Road and the Southerly Access Road may be removed or have movements restricted to right-in/out in order to improve traffic flow and safety along US 12. These changes could be implemented with the project to improve the s-curves south of the BAAP (ID 1670-02-77). See Exhibit 15—CTH Z, CTH PF, Sauk Prairie Road & Bluffview Meadows TSM Alternatives.

Groth Road is located at the base of the Baraboo Hills, where a significant number of crashes have occurred. The steep hill contributes to higher speed traffic travelling southbound at this location. At a minimum, removing left turns from this intersection will remove the crossing conflict. If right turns are allowed to remain the southbound right turn lane should be extended. This intersection provides access to two residential properties that can also be accessed from King's Corner Road, located approximately 1000 feet south.

North Road is the northerly entrance to the Bluffview Meadows neighborhood. It is recommended to remove all left turns at this intersection to eliminate crossing conflicts. To improve operations on southbound US 12, addition of a right turn lane and improvements to the acceleration taper shall be provided.

Armory View Road is the southerly entrance to the Bluffview Meadows neighborhood. It is recommended to remove all left turns at this intersection to eliminate crossing conflicts. To improve operations on southbound US 12, extension of the right turn lane and improvements to the acceleration taper shall be provided.

Southerly Access Road is an unimproved roadway located south of Armory View Road. It is recommended to remove all left turns at this intersection to eliminate crossing conflicts. If the road is paved in the future to accommodate increased traffic volumes, the intersection shall be brought up to rural intersection standards.

Center Road will remain as the only full access intersection to the Bluffview Meadows neighborhood. Improvements to the turn lanes and acceleration tapers may be warranted to improve intersection operations once the adjacent intersections are restricted.

S-Curves at BAAP

Development of alternatives to soften these curves is included in this report. The existing vertical and horizontal geometry has some deficiencies for the posted speed of 55 mph. These factors have been identified as contributing to number and types of crashes in this section. A project has been initiated to address the safety issues. Preliminary layouts to reconstruct these curves to a 70 mph design speed have been developed to be implemented in a short-term time horizon. See Exhibit 14—HSIP & Other Projects for preliminary layout information.

CTH Z intersection

The intersection is located at the two lane to four lane transition of USH 12. The northbound merge from CTH Z conflicts with the transition. The expansion from one to two lanes northbound occurs in the same location as the right turn merge from County Z. This causes weaving issues at this location. A separation should be constructed to eliminate that conflict until right turning traffic from County Z has had enough opportunity to reach the posted speed. Two options have been developed to address the weaving issue. See Exhibit 15—CTH Z, CTH PF, Sauk Prairie Road & Bluffview Meadows TSM Alternatives.

14.1.4 Multi Modal & Recreational Recommendations

WisDOT should coordinate with Sauk County and WisDNR to develop a bicycle route plan for the USH 12 corridor and the area between Sauk City/Prairie du Sac and Devil's Lake State park.

14.2 Lueders Road—STH 78

Two projects will address or have addressed many issues within this corridor segment.

Lueders Road to John Adams Street was reconstructed in 2013. It included on and off street multi-modal accommodations. The project also closed 5 of the 38 existing access points within the corridor segment. Coordination of the signal timing for the three signals was also

included. An ideal situation for signal coordination includes regularly spaced intersections (greater than 1/4 mile, less than 1/2 mile), low volume side-roads, limited access to the main roadway, and low volume pedestrian crossings. This section of US 12 has several driveway access points, high volume sideroads and high volume pedestrian crossings. Due to these challenges, WisDOT will monitor and optimize the signal timing to properly manage the local and regional traffic along this segment.

John Adams Street to STH 78 was reconstructed between 2002 and 2004. It included on and off street multi-modal accommodations and access control measures.

Additional access control is desirable in this urban, high-traffic area to improve safety and maintain mobility.

14.2.1 Consolidation of Access

It is recommended to eliminate and consolidate additional accesses in the Sauk City section at the locations as shown on the Access Control Exhibits in Exhibit 6—Access Management. The recommendations still allow for direct access to US 12 for the property owners.

14.2.2 Multi Modal & Recreational Recommendations

Future projects on US 12 shall adhere to TRANS 75 for bicycle and pedestrian accommodations.

14.3 STH 188—STH 19 WEST

14.3.1 Transportation System Management Alternative Short-Term

Intersection Improvements

Based on comments from the PIM, sideroad intersections could use longer acceleration lanes onto US 12. This would be a relatively inexpensive upgrade to help some drivers feel more at ease entering traffic on the highway. Additional pavement marking or signing should also be considered at these intersections to discourage the stacking up of turning vehicles in the median openings.

14.3.2 Freeway Conversion Alternative Mid-Term

General

The vast majority of project (7.2 miles) would lie in Township of Roxbury. Their comprehensive plan (see Exhibit 10) has stressed that they desire the town to remain agricultural in nature and proposed to designate most of the town's land into an agricultural preservation area type land use. Similarly, the Township of Springfield (1.0 mile of project), has strong desire to remain primarily agricultural in its land use. The remaining 0.4 mile portion of the project lies in the Township of Dane. They also have land use plans that complement those of Roxbury and Springfield.

There are a total of 35 at-grade intersections along this section, 9 with local roads 2 with STH's, 2 with CTH's, 11 with private driveways and 11 with field entrances. This equates to 4.1 access points per mile for this 8.6 mile segment, which is a very acceptable rate for this class of roadway.

Agricultural access to US 12 has been identified as a very crucial element to local land owners. Local officials, the Agricultural study and local planned land uses reinforce this. Even minor changes to existing accesses to US 12 may have economic consequences to the local farming community. The segment is not experiencing acute safety or operational issues that would suggest conversion to a freeway is necessary in the short term. That being said, long term transportation planning must address the possible need for this section of US 12 to become a freeway in the future. The following discussion looks at the possible locations for interchanges, overpasses and frontage roads that would be needed to make the conversion from an expressway to a freeway. See Exhibit 13—Freeway Conversion Options for general concepts.

Interchange Locating

The most logical locations for interchanges would be near STH 188 and at CTH KP in order to capture existing roads networks.

The approximate spacing between these potential interchanges is as follows. There is a 2 mile minimum per FDM 11-5 Attachment 5.1 between successive freeway interchanges.

- WI River Bridge→STH 188~0.5 miles
- STH 188 →CTH KP~4 miles
- CTH KP→potential interchange at CTH P~5.5 miles

STH 188

The STH 188 location would link two state trunk highway's 188 & 78 that are now offset by approximately 0.30 mile. The Town of Roxbury's plan endorses this option. Lands are planned for more urban uses in these areas.

CTH KP

The CTH KP location lies in an area of the most productive agricultural soils and in area of a planned agricultural preservation area. Some existing farm operations would be cut-off from some parcels if an interchange were developed at this location.

Other Interchange Locations

Building an interchange in other locations is not recommended. This would require substantial construction of new collector roads that may encourage development in areas not planned for by the townships.

Overpass Locating

Overpass locations should be on roadways with good connectivity to the local road network, but without the necessity of direct access to US 12. CTH Y and Breunig Road are good options. Simpson Road would be less favorable but necessary as part of the freeway conversion. An overpass in this location would need to be built in conjunction with frontage roads to maintain access to US 12 at selected points.

Frontage Roads

Frontage roads will be required to facilitate removing accesses off of US 12 to complete a conversion to a freeway. The remnants of the Old US 12 roadbed and right-of-way have been preserved in some sections and would serve as good frontage road locations. This would require less disruption to existing access points and farm operations.

14.3.3 Multi Modal & Recreational Recommendations

Based on local official and public comments, there is a strong desire to connect the Dane County Highway 12 Path from Dunlap Hollow Road to Rauls Road. Opposition to additional agricultural land being converted to transportation uses is expected. Opportunities to use existing right-of-ways, parallel sideroads and old US 12 roadbeds are present. At least two structures would be required to transition the trail from the eastbound to the westbound sides of US 12 to utilize existing infrastructure. The long steep grade of the terrain at the southerly end of this connection, will pose substantial difficulties in building a functional facility adjacent to US 12.

Future projects on US 12 shall adhere to TRANS 75 for bicycle and pedestrian accommodations.

Snowmobile crossing of US 12 at CTH KP should be maintained. If CTH KP is grade separated in the future, facilities to continue this crossing need to be provided.

The existing park-n-ride at STH 188 and US 12 is currently operating near capacity. The park-n-ride construction plan included future expansion plans to accommodate and encourage car pooling activities.

EXHIBIT 1
PROJECT LOCATION MAP

Project Location

WisDOT ID: 1670-10-09
USH 12 Corridor Study
Ski Hi Rd - WIS 19 West
Sauk and Dane Counties



