Road Safety Audit
January 18, 2012
Final

Project I.D. 6145-01-01
USH 12 (Wisconsin Dells Parkway)
Broadway Street to Whitlock Street
Sauk County, WI

Prepared for:
WisDOT

January 18, 2012

GRAEF
Consulting Engineers and Scientists
One Honey Creek Corporate Center
125 South 84th Street, Suite 401
Milwaukee, Wisconsin 53214
Telephone: (414) 259-1500
FAX: (414) 259-0037

www.graef-usa.com

Ourston Roundabout Engineering, Inc.
5325 Wall Street, Suite 2305
Madison, Wisconsin 53718
Telephone: (608) 249-4545
FAX: (608) 249-4402

www.ourston.com

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US 12 (Wisconsin Dells Parkway) Road Safety Audit

STH 23 (Whitlock Street) to STH 13 (Broadway Street)

Sauk County, Wisconsin

Project I.D. 6145-01-32

January 18, 2012

Prepared for:

Wisconsin Department of Transportation Southwest Region
3550 Mormon Coulee Road
La Crosse, WI 54601
Project Manager: Anne Wallace
Phone: 608.785.9048

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Ourston Roundabout Engineering

US 12 Road Safety Audit
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INTRODUCTION

This Road Safety Audit was conducted for the 2.6 mile section of US 12 between STH 23 (Whitlock Street) and STH 13 (Broadway Street) in the Village of Lake Delton and the City of Wisconsin Dells as shown on Exhibit 1. The study area includes a nationally recognized tourist destination with several water parks, various attractions, hotels, motels, shops and restaurants. The WisDOT has two projects currently underway for the US 12 corridor including a resurfacing project (I.D. 6145-01-32) to occur next year and a corridor project (I.D. 6145-01-01) to be constructed in 2018. Due to the upcoming projects, countermeasures were identified for the short term to incorporate in the resurfacing project, interim (prior to the corridor project) and long term as part of the corridor project. This report documents the procedures, findings and recommendations of this Road Safety Audit.

BACKGROUND

There is a high volume of pedestrian and bicycle activity along the US 12 corridor. In July of 2011, a pedestrian fatality occurred on the south end of the project at E. Adams Street. Additionally, there was a bicycle fatality in July of 2010 in the same area. From 2005 to 2009, there were 5 crashes involving pedestrians and 18 crashes involving bicyclists. Due to the recent fatalities, one of the main goals of this Roadway Safety Audit is to identify countermeasures specifically addressing the safety concerns for pedestrians and bicyclists that use the corridor. Interactions with corridor stakeholders and observations along the corridor have identified the following concerns:

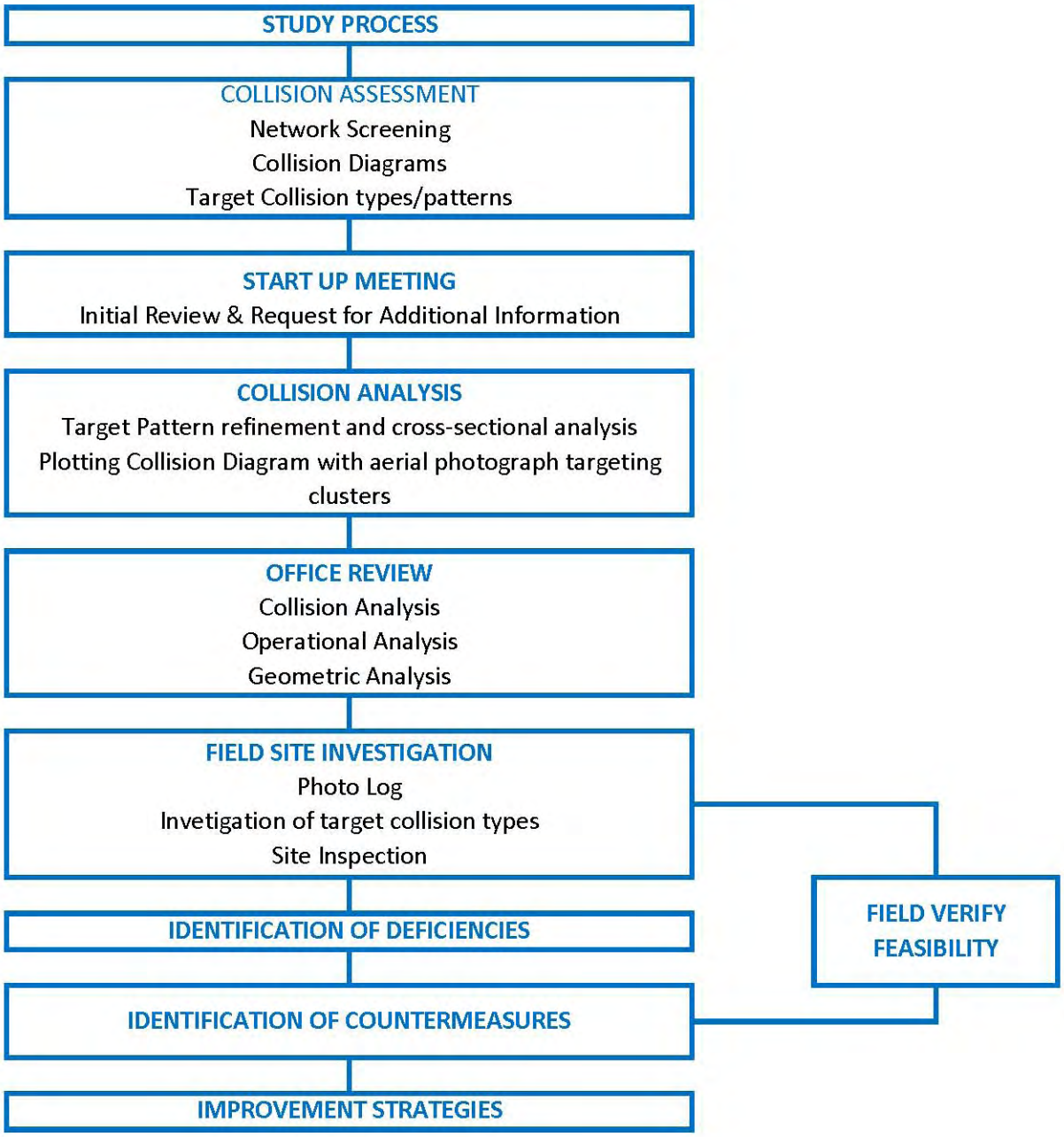
1. The larger tourist destinations located along the corridor invite international workers from locations around the world where often it is customary for drivers to yield to both pedestrians and bicyclists even when they are not in a crosswalk. This results in a complex group of stakeholders that may require a tiered approach involving improvement infrastructure, education of corridor users, and implementation by local governments and law enforcement.

2. The sidewalks are unusually close to the roadway and too narrow for shared use. Drivers have difficulty setting up for egress while needing to attend to the presence of pedestrians on the sidewalk. Moreover, numerous bicyclists compound the motorists driving task of gap seeking in moderately fast roadway traffic. Driver expectancies are violated by bicyclists traveling on the sidewalk in the wrong direction with respect to motorists making lefts into driveways.

3. Due to the lack of controlled intersections along the corridor, there are no marked pedestrian crossings near major destinations, causing pedestrians to cross at random locations.

Methodology and Approach

The overall approach for the Road Safety Audit is shown in the diagram below. The US 12 Corridor Study completed in February 2011 summarized the crash history along the corridor and started to identify safety concerns by prioritizing six key locations. The remaining steps are further discussed in this report.



Crash History

The US 12 Corridor Study (February 2011) included crash data for the section from STH 23 to CTH A over a five year period (January 1, 2005 through December 31, 2009). GRAEF has supplemented the previous study with the north segment between CTH A and STH 13. It should be noted that property damage crashes with less than $1,000 of damage do not need to be reported in Wisconsin. During the five years, 401 crashes were reported within the study area including 23 crashes involving pedestrians or bicyclists.

For comparison purposes, crash rates for roadway segments are calculated in units of crashes per 100 million vehicle miles (HMVM). Table 1 summarizes the crash rate for the three roadway segments included in the study area. The roadway crash rates are also illustrated on Exhibit 2.

Table 1
Roadway Segment Crash Rates

Segment	Length (miles)	AADT	Total Crashes (2005-2009)	Crash Rate (Crashes per HMVM)	2009 Statewide Average Crash Rate (Crashes per HMVM)
South Segment (Undivided) *North of STH 23 to south of Lake Avenue (Lake Delton)*	0.8	19,800	126	436	335
Center Segment (Undivided) *South of Lake Avenue to north of CTH A (Lake Delton)*	1.3	19,640	262	562	335
North Segment (Divided) *North of CTH A to south of STH 13 (Wisconsin Dells)*	0.5	19,640	13	73	326
Entire Corridor *North of STH 23 to south of STH 13 (Lake Delton & Wisconsin Dells)*	2.6	19,701	401	429	N/A

Source for Center & South Segment Crash Data: US 12/Wisconsin Dells Parkway Corridor Study (February 2011)

As shown in Table 1, the Year 2009 statewide 5-year average crash rate for an undivided state trunk highway was 335 crashes per HMVM and 326 crashes per HMVM for a divided state trunk highway (excluding deer crashes). As shown in Table 1, crash rates for the undivided sections (i.e. center and south segments) exceed the statewide average. Whereas, the crash rate for the northern divided section is considerably less than the statewide average.

As expected, the majority of the crashes (68 percent) occurred during June, July and August. If the crashes occurring in May and September are included, 83 percent of the crashes occurred during the five month period. Therefore, GRAEF will be evaluating a seasonal crash rate further as part of the corridor project.

From 2005 to 2009, there were 5 crashes involving pedestrians along the corridor. During the five year period, 18 bicycle crashes were reported although the actual number is expected to be much higher as many minor bicycle crashes are not reported. Injury crashes are reported by the following classifications:

- Type A: Incapacitating Injury
- Type B: Nonincapacitating Injury
- Type C: Possible Injury

Table 2 summarizes the pedestrian and bicycle crashes along the corridor and includes two more recent crashes from July 2010 and July 2011 resulting in fatalities.

Table 2
Pedestrian and Bicycle Crash Summary

US 12 Location	Date	Pedestrian		Bicycle		Crossing		Notes
		Injury Level	Fatality	Injury Level	Fatality	US 12	Minor Street/ Driveway	
E. Adams Street	8/12/06	A				X		
	7/9/10				*X*		*X*	
	7/30/11		*X*			*X*		
Shady Lane	5/26/05			B			X	
Near Former Houlihan's	7/30/05			C		X		
Dekorra Lane	6/23/06			B			X	Hit & run
Lake Avenue (Traffic Signal)	7/14/06			B		X		
	8/3/08			C			X	
	7/26/09			B			X	
Near 4 Seasons Motel	5/27/07	A				X		Hit & run Alcohol
Shamrock Motel Driveway	7/7/06			B			X	
Shopping Center Driveway (North of Mr. Pancake)	7/29/08			B			X	
Near Pizza Pub/ Former Marley's	7/31/05	A				X		Alcohol
	5/16/07			B		X		
Near Star Motel South Driveway	6/20/09	A				X		Child pedestrian Alcohol
Mt. Olympus Resort Driveway	7/22/06			B			X	
Between Bonanza Drive & Mt. Olympus Resort	8/29/08			B		X		Rear end crash Alcohol
Bonanza Drive	7/29/06			B			X	
Take a Dare Driveway	*7/26/11*			*C*			*X*	
Original Wisconsin Ducks South Driveway	7/27/08	B				X		Child pedestrian
	6/24/09			C			X	
	6/28/09			B			X	
Original Wisconsin Ducks North Driveway	8/28/06			A			X	
	6/9/09			C			X	
Skyline Hotel Driveway	7/31/07			C			X	
CTH A (Traffic Signal)	8/22/08			C			X	Crossing WB right-turn lane

Source: US 12/Wisconsin Dells Parkway Corridor Study (February 2011)

As shown in Table 2, pedestrian and bicycle crashes are occurring throughout the corridor. All of the pedestrian crashes including the most recent fatality involved pedestrians crossing US 12. Of the five pedestrian crashes that occurred during the five year period, four of the crashes involved incapacitating injuries (Type A). Fourteen of the eighteen reported bicycle crashes involved a bicycle crossing a driveway or minor street.

Field Safety Review

A Road Safety Audit advisory team was created to assist in identifying safety deficiencies and potential solutions for the corridor. These members include WisDOT Safety and Design Specialists, Local Municipal Representatives, Local Law Enforcement Representatives and the Consultant Design Team.

The following observations were noted by the advisory team during the review of the corridor:

- All bicyclists use the sidewalk, no bicycles were observed in the roadway. Bicyclists ride in both directions on the sidewalks.
- There are no countdown timers at the existing signalized intersections.
- The lane widths are not equally spaced along the corridor. Generally, the outside lane is wider than the inside lane.
- There is a flashing beacon with a warning sign "SHOW ENTRANCE" for the Tommy Bartlett Show Entrance.
- The signal heads at E. Lake Avenue are difficult to see when traveling northbound. Additionally, there is no northbound protected left turn phase. The collision history shows a slight pattern of opposing left turn crashes in this regard.
- Roadway lighting is sporadic and inconsistent along the corridor.
- The curbs are painted yellow within the Village of Lake Delton municipal limits.
- Commercial signing and lighting is somewhat overwhelming along the corridor – drivers may be over stimulated visually. It is difficult to see the CTH A signal amidst the information.
- Sidewalk is very inconsistent along the corridor and often does not exist in driveways – pedestrian priority is somewhat confusing.
- There are many very wide driveways along the corridor and many properties with multiple driveways serving the same function.
- The section of STH 13 through downtown Wisconsin Dells has mid-block crosswalks that are not signalized, but the typical section is designed for lower speeds.
- The operating condition is frequently characteristic of a downtown street mainly due to the absence of turn lanes and because driveways are so closely spaced and not aligned.
- The profile of the roadway is not conducive to the type of frontage access and close spacing of driveways. Sight distance from driveways in the vicinity of vertical and horizontal curves has difficult egress. Stopping sight distance is likely insufficient.
- Generally, the access spacing is characteristic of a low speed (25 mph) urban roadway. This is inconsistent with the speed and function of this highway. The horizontal and vertical alignment is not consistent with the character of urban development and the proximity or spacing of access. The posted speed limit (35 mph) is not compatible with the number of driveways due to the conflicts for vehicles and pedestrians. The vehicles turning into the driveways impede the through traffic and cause a safety concern along the roadway.
- The sidewalks are unusually close to the roadway and too narrow for shared use. Drivers have difficulty setting up for egress while needing to attend to the presence of pedestrians on the sidewalk. Moreover, numerous bicyclists compound the motorists driving task of gap seeking in moderately fast roadway

traffic. Driver expectancies are violated by bicyclists traveling on the sidewalk in the wrong direction with respect to motorists making lefts into driveways.

- Driveway profiles are not smooth and flat requiring additional care and slowed driveway ingress and egress. This is compounded by pedestrians and bicyclists.
- Navigation and way-finding may be impeded by roadside information. A signing scheme that distinguishes the types of businesses (attractions, lodging, shopping, restaurants, etc.) may be an option to improve way-finding.

The meeting minutes for the field review and the kick off meeting with the local agencies are included in Appendix 1.

A summary of existing safety issues for the US 12 corridor was assembled based on the review of collision diagrams and crash history, field safety review and existing geometric deficiencies. Tables 6 and 7 summarize the safety concerns identified in the road safety audit. The existing corridor deficiencies are shown on Exhibit 3.

Crash Risk Assessment

A crash risk assessment was conducted for the safety issues identified along the corridor. Assessing the crash risk involves a three step process: 1) rate the crash frequency; 2) rate the crash severity; and 3) combine the frequency and severity ratings to determine the overall crash risk.

Table 3 summarizes the classifications used to evaluate the expected frequency caused by safety issues.

Table 3
Crash Frequency Rating

Estimated		Expected Crash Frequency (per audit item)	Frequency Rating
Exposure	Probability		
High	High	10 or more crashes per year	Frequent
Medium	High		
High	Medium	1 to 9 crashes per year	Occasional
Medium	Medium		
Low	High		
High	Low	Less than 1 crash per year, but more than 1 crash every 5 years	Infrequent
Low	Medium		
Medium	Low	Less than 1 crash every 5 years	Rare
Low	Low		

The severity of the crash was rated based on the descriptions included in Table 4.

Table 4
Crash Severity Rating

Typical Crashes Expected (per audit item)	Expected Crash Severity	Severity Rating
Crashes involving high speeds or heavy vehicles, pedestrians or bicycles	Probable fatality or incapacitating injury	Extreme
Crashes involving medium to high speed; head-on, crossing or run off road crashes	Moderate to severe injury	High
Crashes involving medium to low speeds; left-turn and right-turn crashes	Minor to moderate injury	Moderate
Crashes involving low to medium speeds; rear end or sideswipe crashes	Property damage only or minor injury	Low

The ratings for crash frequency and severity included in Tables 3 and 4 were combined for an overall crash risk assessment rating summarized in Table 5. Each safety issue is assessed on the basis of a ranking between A (lowest risk and lowest priority) and F (highest risk and highest priority).

Table 5
Crash Risk Assessment

Frequency Rating	Severity Rating			
	Low	Moderate	High	Extreme
Frequent	C	D	E	F
Occasional	B	C	D	E
Infrequent	A	B	C	D
Rare	A	A	B	C

A risk rating was assigned to each safety issue identified in Tables 6 and 7. Potential countermeasures (improvements) have been suggested for the identified safety issues. Three levels of improvements have been identified for the safety issues to address the short term by incorporating improvements in the resurfacing project, interim (before the corridor project) and long term with the future corridor project as detailed below:

- Short Term Improvement to Incorporate in the Resurfacing Project
  Identify improvements that may be done as part of the resurfacing project to improve safety until the future reconstruction project can address the larger concerns. These improvements may not require right-of-way or large scale road construction. Countermeasures including traffic signal modifications, new signing and pavement marking enhancements will be considered.
- Interim Improvements
  Identify any interim improvements that could be implemented as a pilot study. These interim improvements could include a pedestrian crossing with median, pedestrian signal, traffic signal, etc. Additional studies are needed to further evaluate
- Long Term Improvements for Future Corridor Project
  Begin to identify areas of concern and potential countermeasures that may apply to the US 12 corridor project.

Table 6
Summary of RSA Corridor Safety Issues & Potential Suggestions

Safety Issue (Location and Description)		Risk Rating	Short Term / Lower Cost Improvements	Potential Interim Considerations (To be further evaluated)
Lake Avenue Intersection	Sight distance concerns due to the horizontal curve	E	Provide advance signing for traffic signal	
	Poor visibility of signal heads	D	Extend the trombone arm for the south approach Provide trombone arms for the east and west approaches	
	Operational deficiencies	D	Consider adding westbound protected/ permitted left-turn phasing	
	Pedestrian push buttons appear to be placed backwards and are not conveniently located for pedestrians on the sidewalk	N/A	Relocate pedestrian push buttons	
	No pedestrian countdown timers	C	Install pedestrian countdown timers	
Pilgrim Drive	Sight distance looking north is not adequate due to Mr. Pancake Restaurant building and sign	E	Restrict the eastbound left-turn movement	
Original Wisconsin Ducks	Concern for southbound traffic coming over the crest curve with left-turning vehicles queued	D	Consider providing advance warning signs with flashing beacon activated during specific hours of tourism season. 	
	Steep grade likely influences excessive speed	D		Consider conducting a speed study to determine if the speed limit should be lowered
CTH A Intersection	Pedestrian push buttons appear to be placed backwards and are not conveniently located for pedestrians on the sidewalk	N/A	Relocate pedestrian push buttons	
	No pedestrian countdown timers	C	Install pedestrian countdown timers	
Corridor	Roadway lighting appears inconsistent and could cause nighttime vision issues	D	Based on field observation, roadway lighting should be added in the following areas: • North of Spring Creek crossing • Lake Avenue intersection • South of CTH A	
	Pedestrian facilities are incomplete	E	Provide sidewalk ramps Upgrade marking for crosswalks at signalized intersections Install pedestrian countdown timers Education and training programs	
	Drivers are not yielding to pedestrians and bicycles on sidewalks. Sidewalk is inconsistent and not clearly marked. The sidewalk seems to disappear in locations with wide driveways. 	D	Provide pavement marking on driveway approaches to help delineate the sidewalk and make motorists aware that pedestrian\bicyclist have the right-of-way as shown below.  Education and training programs	
	Pedestrians crossing US 12 at various midblock locations	E		Conduct a pedestrian study to further evaluate appropriate improvements and locations *(To be investigated during the summer of 2012)*
	Signs for businesses can be a distraction for drivers	C	Relocate any signs located in vision corners Consider policies to limit the number and size of signs	Implement and enforce sign policy

Table 7
Potential Countermeasures for Consideration With Corridor Project

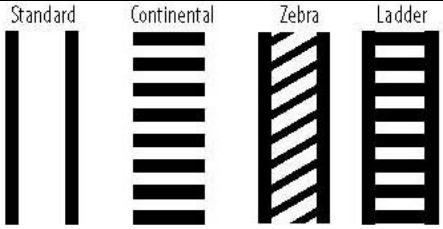
Safety Issue	Risk Rating	Potential Long Term / Higher Cost Considerations (To be further evaluated)
Roadway lighting appears inconsistent and could cause nighttime vision issues	D	Provide consistent lighting along the corridor
Significant number of closely spaced access points	C	Relocate, consolidate or close access points Reduce width of driveways Consider a raised median to control access Investigate a frontage or backage road system Investigate one-way pairs
Lack of exclusive turn lanes on US 12 at signalized intersections and throughout corridor	D	Provide exclusive turn lanes where warranted
Pedestrian facilities are incomplete	E	Provide sidewalk and sidewalk connections
Lack of dedicated bicycle facilities resulting in bidirectional bicycle traffic on sidewalks	E	Provide bicycle accommodations Consider on road and off road bicycle facilities
Drivers are not yielding to pedestrians and bicycles on sidewalks.	E	Educate the drivers – Consider focus brochure on safe driving with pedestrians & bicycles to distribute in businesses along corridor.
Pedestrians crossing US 12 at various midblock locations	E	Consider a raised median to provide refuge for pedestrians crossing US 12 Consider median treatment to restrict locations for pedestrian crossings Consider narrowing the roadway or providing bumpouts to reduce the crossing distance Consider signalized pedestrian crossing Investigate pedestrian bridge(s)
Poor visibility of signal heads	D	Provide signal heads per lane
Inadequate decision sight distance throughout corridor	D	Reduce conflict points Increase vertical curve length (k value)
Minimum stopping sight distance is not met near Spring Creek crossing (shown on Exhibit 3A)	D	Reconstruct to meet minimum stopping sight distance
Minimum intersection sight distance is not met at: • Durkee Street – looking south • Shady Lane – looking north • Hiawatha Drive – eastbound looking south • Dekorra Lane – looking north and south • Bonanza RV Park – looking south	D	Reconstruct deficient features to meet desirable intersection sight distance
Some utility poles are located within the 1½' to 2' lateral clearance	E	Relocate utility poles to provide adequate clearance
Driver Behavior Issues		Investigate education and training programs

POTENTIAL COUNTERMEASURES

Potential countermeasures were considered for pedestrian crossings, pedestrian and bicycle accommodations, driveways, intersections, roadway facility and the visual environment. This section identifies the range of improvements for each of these countermeasures.

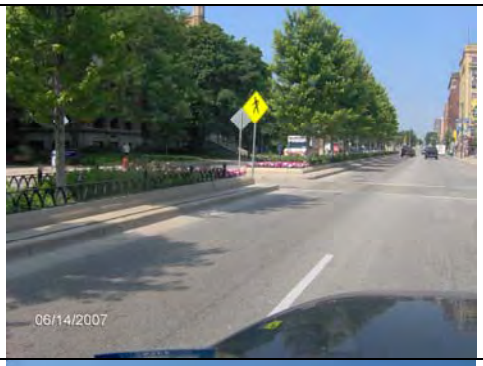
Pedestrian Crossings

There are a number of countermeasures that may be considered when addressing pedestrian crossings ranging from signing and marking to signalization. It is important to identify the crossing locations prior to recommending an appropriate mitigation technique. Items considered by the design team are summarized below.

Signage Signs are important to inform motorists of a pedestrian crossing area.	
Crosswalk Markings Marked crosswalks are beneficial because they inform motorists and pedestrians that they are in, or are approaching, the pedestrian right of way. Marked crosswalks also can be used to advise pedestrians of the best place to cross the street. Marked crosswalks are best used in combination with other treatments such as traffic signals, reduced speeds, signs, and pavement striping, color, or height changes.	 *Exhibit 5-56: Common styles of crosswalk markings used in Wisconsin.*
Decorative Crosswalks Decorative crosswalks are often used to alert motorists that pedestrians may be present at these locations.	
Lighting Pedestrian crossing needs to have appropriate lighting.	
In Pavement Crosswalk Lighting Lights are embedded in the pedestrian push button. Long term maintenance should be evaluated and compared to other options.	

Median Treatments

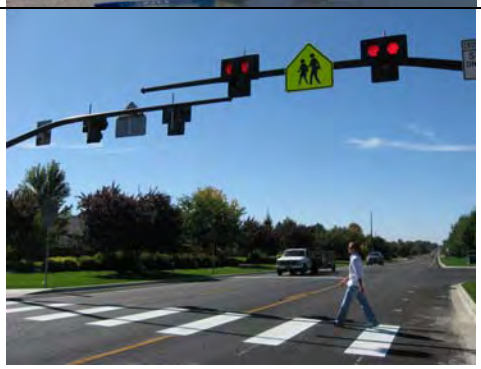
Planters and fencing in the median and along edge of roadway can be used to restrict pedestrian crossings to specific locations.



Pedestrian Signal or Hybrid Beacon

Recent studies have shown that High intensity Activated crossWalK (HAWK) beacon has a better compliance rate by motorists than other devices at pedestrian crossings.

The HAWK beacon remains dark unless a pedestrian activates the push button. The beacon will start flashing yellow indicating that drivers should reduce speed and be prepared to stop for a pedestrian. The flashing yellow is followed by a solid yellow and then solid red requiring drivers to stop at the stop line. At this time, the pedestrian receives a Walk phase. A countdown timer indicates the amount of time left to cross.



Pedestrian Bridge

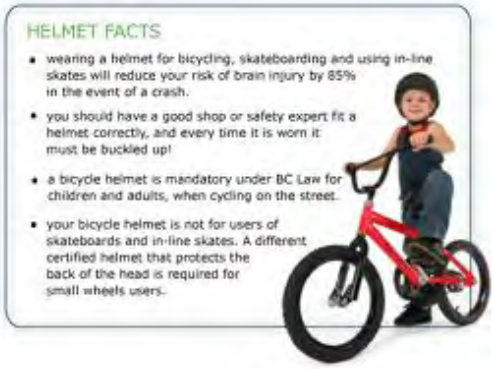
A grade separated crossing is the safest crossing for pedestrians and bicycles.

Education

Many organizations throughout Wisconsin provide bicycle education including the Wisconsin Department of Transportation and the Bicycle Federation of Wisconsin. The Village & City should work with these organizations as well as stakeholders along the corridor with a goal to have 100% of summer workers within the area receiving bicycle safety education.

Bicycle education is concerned with three primary objectives including:

1. Develop safe cycling skills in the international community.
    - Programs within the Village and City Recreational Departments
    - Programs with stakeholders along the corridor
    - Bicycle Rodeo & Bicycle Helmet Give Away
    - Include policies for both the Village and the City and highlight any differences that may exist.
2. Teaching bicyclists their rights & responsibilities
    - WisDOT: Teaching Safe Bicycling / Train the Trainer – Educational opportunity offered once a year to assist in developing staff
3. Teaching Motorists how to share the road with bicyclists
    - Establish brochures for community distribution



Enforcement The Village and City should both have active policies on bicycle use within the municipal boundaries. As part of the municipal ordinance, citizens and summer workers should be required to register their bicycles with the municipality and take a bicycle education class. A registration tag is issued to the bicycle owner and should be affixed to the vertical bar that supports the seat.	

Pedestrian & Bicycle Accommodations

FHWA and WisDOT have placed a renewed emphasis on incorporating bicycle, pedestrian and transit accommodations into projects to conform to the complete streets law.

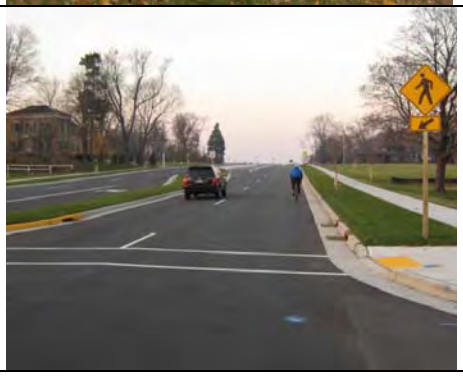
Pedestrian Facilities

Pedestrian travel forms an important part of the total transportation infrastructure in Wisconsin. Many people rely on walking as they travel from their homes to work, school, the bus stop, or to shop. For the elderly, children, and those who are disabled, having safe and convenient pedestrian facilities is essential to daily activities. Pedestrian travel provides several "value-added" social and economic benefits to the community. For these reasons, WisDOT recognizes the importance of pedestrian travel as a legitimate and necessary transportation choice. *(WisDOT Pedestrian Policy Plan 2020)*

Bicycle Facilities

It is WisDOT's policy to provide bicycle facilities whenever possible with their projects.

The following is a brief description from the *WisDOT Bicycle Planning Guide* of the major types of bicycle and pedestrian facilities found in the state of Wisconsin and the characteristics attributable to each:

Consistent Sidewalk Network Sidewalk is an off-road concrete walkway (minimum 5 foot width) to accommodate pedestrians.	
On Road Bicycle Accommodations Bicycle accommodations include a wider outside travel lane (minimum 14 foot width) to accommodate bicyclists on both sides of the roadway to travel in the direction of vehicular traffic.	

Bicycle Lane A bicycle lane is a designated on-road lane (minimum 5 foot width) provided on both sides of the roadway for bicyclists to travel in the direction of vehicular traffic.	
Mulit-Use Path (Off Road) A multi-use path is an off-road asphalt path to accommodate bidirectional pedestrian and bicycle traffic (minimum 10 foot width). It should be noted that vehicles yield to the pedestrians and bicycles in a multi-use path. Therefore, a multi-use path is not recommended in locations with a high number of access points.	

Driveways

The countermeasures for driveways are based on the principles of access management. Access Management is a critical component to provide safe and efficient traffic flow. Access Management recommendations will be based on principals identified by the Transportation Research Board's (TRB's) *Access Management Manual*.

Limit direct access to major roadways	Relocate, consolidate or close driveways
Separate the number of conflict points	Proper spacing of intersections and driveways improvements safety and operations.
Remove turning vehicles from through traffic lanes	Provide exclusive turn lanes
Manage left-turn movements with a raised median. Raised medians provide greater flexibility in restricting or eliminating specific movements.	 
Provide a supporting street and circulation system	Frontage and/or backage road system

Intersections

Intersection geometry will be analyzed along the project route to improve traffic operations and ensure a safe facility for both pedestrians and the motoring public. During the conceptual planning process, the major intersections will be evaluated in accordance with FDM Procedure 11-25-1, using the WisDOT Intersection Control Evaluation (ICE) which requires the team to look at the benefits of all types of intersection control along the corridor. The study will include the analysis of traffic operations and geometric improvements under appropriate types of traffic control which may include stop sign control, traffic signal control, and a modern roundabout. The design team will complete an evaluation\comparison of the following nine factors for each alternate: Safety, Operational Analysis, Construction Cost, Right-of-Way Impacts, Practical Feasibility, Operation & Maintenance Cost, Environmental, and Pedestrian & Bicycles. This comparison will lead to a recommended type of control for the proposed improvement.

Intersection Control

Traffic Signal

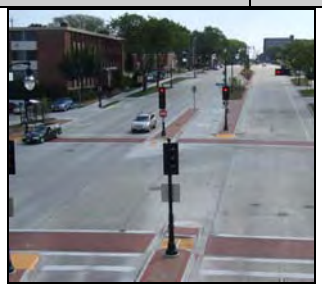
- Creates gaps in traffic to improve operations at adjacent stop controlled intersections or driveways.
- Specific signal timings can accommodate special event traffic.
- Allows u-turns to promote access restricted by medians.

Roundabout

- Fewer conflict points and slower speeds resulting in safer intersections.
- Typically less delay and shorter queues than traffic signals.
- Accommodates safer u-turns than traffic signals to promote access restricted by medians.

Stop Sign

- Intersection control for minor intersections.
- Delay is related to the amount of gaps on the major street.
- A raised median increases the capacity and improves safety by allowing a two-stage crossing.



Turn Lane Improvements

Restrict Turn Movements

Upgrade signal equipment

Lighting

Roadway Facility

One of the most important elements of the conceptual design will be the development of the proposed typical section for the facility. The desired functionality of the roadway must be considered as we assess various opportunities for improvement. If the desire is for the facility to have numerous access points and function similar to a downtown main street, then a reduction in traveling speed of the roadway may be appropriate. However, if the priority is to keep traffic flowing safely at the current speed limit, then access will be more restricted. The design team will work with corridor stakeholders to determine early in the design process the vision for the future corridor.

- Appropriate typical section for functional classifications
- Appropriate speed limit
- Desirable lane widths
- Standard vertical and horizontal alignment

Visual Environment

During the field safety review, there were discussions regarding the numerous signs along the corridor causing distractions for the drivers and resulting in unsafe conditions for all roadway users. The corridor project should look to alleviate this concern in the future by evaluating the following items:

- Sign ordinance
- Establish setback policy
- Review the Wisconsin Dells Wayfinding Program Document (February 17, 2006) and look for opportunities to implement wayfinding strategies along the corridor.

RECOMMENDATIONS

This section identifies the recommendations for the resurfacing project as well as items to be considered in the interim prior to the corridor project.

Crosswalks at Uncontrolled Locations

Many studies have been conducted regarding the placement of crosswalks at uncontrolled locations. The Federal Highway Administration (FHWA) issued a report on the *Safety Effects of Marked Versus Unmarked Crosswalks at Uncontrolled Locations*. This report states that "Marked crosswalks alone (i.e., ***without traffic-calming treatments, traffic signals and pedestrian signals when warranted, or other substantial crossing improvement***) are insufficient and should not be used under the following conditions:

1. Where the speed limit exceeds 40 mph
2. On a roadway with four or more lanes without a raised median or crossing island that has an ADT of 12,000 or greater. *(US 12 qualifies for this condition)*
3. On a roadway with four or more lanes with a raised median or crossing island that has an ADT of 15,000 or greater."
   (*Safety Effects of Marked Versus Unmarked Crosswalks at Uncontrolled Locations*, FHWA Publication Number HRT-04-100, September 2005)

Based on corridor observation as well as FHWA safety guidance, the study team does not recommend implementing any uncontrolled mid-block crossings as part of the 2012 resurfacing project.

Resurfacing Project

The recommendations for the resurfacing project are limited due to constraints (right-of-way, excavation, project schedule, etc.). The recommended improvements are listed below and shown on Exhibit 4:

- Update pavement marking:
  - Mark crosswalks through driveways to help delineate the sidewalk
  - Use continental, zebra or ladder markings for crosswalks
  - Encourage the use of symbols instead of words
  - Consider the bicycle symbol in the crosswalk of driveways (Village to consider)
  - Use white edge lines if overlay the gutter
- Update signing:
  - Add signal warning signs on US 12 for CTH A and Lake Avenue
  - Consider overhead street name signs (paid/maintained by municipality)
  - Upgrade pedestrian and bicycle warning signs for driveways

- Upgrade traffic signals:
  - Install advance signal warning signs on US 12
  - Relocate the pedestrian push buttons
  - Install pedestrian countdown timers
  - CTH A:
    - Add pedestrian signal heads and push buttons in median on south approach *
  - Lake Avenue:
    - Extend the trombone arm for the south approach
    - Consider adding westbound protected/permitted left-turn phasing *
      - With the addition of westbound left-turn phasing, it is recommended to provide trombone arms for the east and west approaches *
- WisDOT is planning to implement three pedestrian crossings with hybrid beacons as part of a pilot study. The pedestrian hybrid beacons are proposed to be installed at the following approximate locations as shown on Exhibit 4:
  - 150 feet north of Newsom Road (Station 110+80)
  - 700 feet north of Pilgrim Road near (Station 152+45)
  - 2,400 feet north of Pilgrim Road (near Station 168+65)
- Construct an island at Pilgrim Drive to restrict the eastbound left-turn movement.
- Additional lighting north of Spring Creek crossing, at Lake Avenue intersection and south of CTH A (if feasible)
- Sidewalk ramps (determined by WisDOT)
- Cross slope correction (locations to be determined)

** Explore compatibility with existing equipment and cost.*

Interim

The following items have been identified as potential interim improvements to be further evaluated:

- Conduct a pedestrian study for the 2013 tourist season to evaluate the pedestrian hybrid beacons installed as part of the resurfacing project. Identify any modifications to the pedestrian crossings or additional locations.
- Conduct traffic signal warrant analyses for the major traffic generators. The WisDOT does not allow traffic signals at private access points. If a traffic signal is warranted for a private driveway, the driveway would need to be converted to a public street.
- Conduct a speed study to determine if the speed limit should be lowered.
- Mt. Olympus is considering constructing an exclusive right-turn lane at the resort entrance.
- Work with local government to restrict private signs within the vision triangles and an appropriate distance from the right-of-way
- Collaborate with the local agencies and businesses to develop an Education & Enforcement plan. Consider pedestrian and bicycle safety flyers.

Corridor Project

The corridor project will look to balance the needs of the corridor by evaluating an extensive range of improvements to accommodate all users.

RESOURCES

US 12/Wisconsin Dells Parkway Corridor Study, STH 13-STH 23, Strand Associates, February 2011

FHWA Road Safety Audit Guidelines, Publication No. FHWA-SA-06-06

Pedestrian Road Safety Audit Guidelines and Prompt Lists, FHWA-SA-07-007, July 2007

Safety Effects of Marked Versus Unmarked Crosswalks at Uncontrolled Locations, Final Report & Recommended Guidelines, FHWA Publication Number HRT-04-100, September 2005.

Transportation Research Board (TRB) Access Management Manual, 2003

Wisconsin Guide to Pedestrian Best Practices, December 2010

Wisconsin Pedestrian Laws

NORTH
NOT TO SCALE

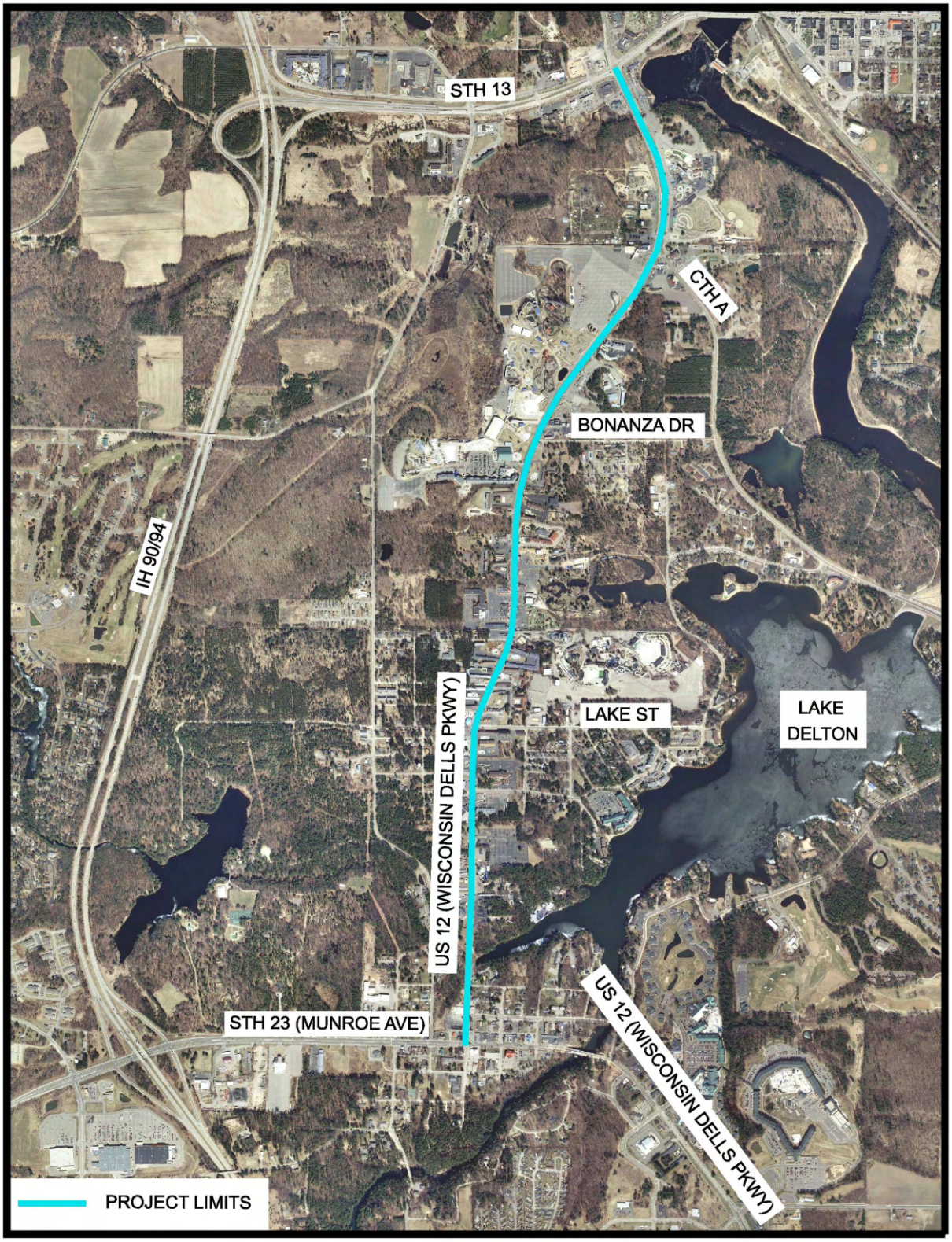


EXHIBIT 1
PROJECT LOCATION MAP
US 12 ROAD SAFETY AUDIT
PROJECT ID 6145-01-32
SAUK COUNTY, WISCONSIN

GRAEF

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NORTH
NOT TO SCALE

EXHIBIT 2
CORRIDOR CRASH RATES
US 12 ROAD SAFETY AUDIT
PROJECT ID 6145-01-32
SAUK COUNTY, WISCONSIN

GRAEF

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EXISTING CORRIDOR DEFICIENCIES

USH 12 (Wisconsin Dells Pkwy)

Sauk County, Wisconsin

EXISTING CORRIDOR DEFICIENCIES

USH 12 (Wisconsin Dells Pkwy)

Sauk County, Wisconsin

PROPOSED RESURFACING IMPROVEMENTS EXHIBIT

USH 12 (Wisconsin Dells Pkwy)

Sauk County, Wisconsin

PROPOSED RESURFACING IMPROVEMENTS EXHIBIT

USH 12 (Wisconsin Dells Pkwy)

Sauk County, Wisconsin

Appendix

Road Safety Audit Field Review & Kick Off Meeting Minutes

Us 12

Partnering for a Safe Solution

Project 6145-01-01/32
US 12
Roadway Safety Audit (RSA)
August 17, 2011, 9:00 AM
Village of Lake Delton
Administration Building
50 Wisconsin Dells Parkway South

USH 12: STH 13 (Broadway Street) to STH 23 (Whitlock Street), Sauk County

ATTENDANCE:

Tom Diehl	Village of Lake Delton
Raine Gardner	MSA Professionals (Representing Village of Lake Delton)
Kay Mackesey	Village of Lake Delton
Chris Tollaksen	City of Wisconsin Dells
Perry Mayer	City of Wisconsin Dells Police Department
Reiny Yahnke	Wisconsin Department of Transportation – Traffic
Mary Beth Pettit	GRAEF / Consultant Review Team
Andre Ost	GRAEF / Consultant Review Team
Mark Lenters	Ourston / Consultant Review Team

This purpose of this meeting was to kick-off the Road Safety Audit being that is being performed on behalf of the Wisconsin Department of Transportation for Project I.D. 6145-01-32, the US 12 Resurfacing project scheduled for fall 2012. The day consisted of the following activities:

1) Corridor review - DOT / Consultant Review Team
2) Meeting at the Village of Lake Delton Administration Building with representatives from the Village of Lake Delton and the City of Wisconsin Dells
3) Afternoon Field Review Mtg (DOT & Consultant Staff) to further review the corridor and hot spots mentioned in the Strand Safety Study and other areas mentioned during the morning meeting.

Action Items:

Discussion Items:

9:00 AM Corridor Review / DOT & Consultant Review Team

1) The following observations were noted by the team during the review of the corridor:
   - All cyclists use the walk, no bicycles were observed in the roadway. Cyclists ride in both directions on the sidewalks.
   - There are no countdown timers at the existing signalized intersections.
   - The lane widths are not equally spaced along the corridor. Generally, the outside lane is wider than the inside lane.
   - There is a flashing beacon with a warning sign "SHOW ENTRANCE" for the Tommy Bartlett Show Entrance.
   - The signal heads at E. Lake Avenue are difficult to see when traveling northbound. There is no NB advanced phase to mitigate the absence of NB left turn sight distance. The collision history shows a slight pattern of opposing left turn crashes in this regard.
   - Roadway lighting is sporadic and inconsistent along the corridor.
   - The curbs are painted yellow within the Village of Lake Delton municipal limits.
   - Commercial signing and lighting is somewhat over-whelming along the corridor – drivers may be over stimulated visually. It is difficult

to see the CTH A signal amidst the information.
- Sidewalk is very inconsistent along the corridor and often does not exist in driveways – pedestrian priority is somewhat confusing.
- There are many very wide driveways along the corridor and many properties with multiple driveways serving the same function.
- The Downtown Dells area does have mid-block cross walks that are not located at traffic signals.
- There are very few regulatory signs along the corridor.
- The operating condition is frequently characteristic of a downtown street mainly due to the absence of turn lanes and because driveways are so closely spaced and not aligned.
- The profile of the roadway is not conducive to the type of frontage access and close spacing of driveways. Sight distance from driveways in the vicinity of vertical and horizontal curves has difficult egress. Stopping sight distance is likely insufficient.

10:30 AM Roadway Safety Audit Kick-Off Meeting

1) The meeting began with introductions.
2) Mary Beth provided a description of the two projects planned for the US 12 corridor.
    - I.D. 6145-01-32 / US 12 Resurfacing Project. This project is currently underway and will include the resurfacing of the US 12 pavement within the corridor limits. The intent of this project is to provide an interim improvement to the corridor that will extend the life of the pavement until the larger improvement project can be built.
    - I.D. 6145-01-01 / US 12 Corridor Project. This study will be starting in the fall and will study various alternates for the corridor that were outlined in the US 12 Corridor Study completed in February 2011.
    - A combined Operational Planning Meeting (OPM) is scheduled for Wednesday, August 24 at 1:00 PM at the Village of Lake Delton Administration Building. This meeting will introduce the study team and provide a first contact to utilities. The information presented will include schedule information for the resurfacing project.
    - A combined public information meeting will be held in the fall to inform stakeholders of the scope and schedule for the resurfacing project and to kick-off the larger study project.
    - Tom asked if the resurfacing project will have any impact on the project schedule for the larger project i.e. is the larger project at risk for delay. Mary Beth indicated that the larger corridor study is laid out as a 40-month study prior to final design which is an adequate time period to complete the work that is needed to be performed to gain concurrence from FHWA. The larger corridor project is planned to occur as scheduled at this time with construction starting in fall of 2017.

3) Mary Beth mentioned that the US 12 Corridor Study completed in early 2011 started to identify safety concerns along the corridor by identifying six

"hot-spots". This Roadway Safety Audit is being conducted with two primary goals:

- To identify improvements that may be done as part of the resurfacing project that would work to improve safety in the interim time period until the larger project can address the larger concerns. These improvements may not require right-of-way or large scale road construction. Counter measures including signal modifications, new signing, and pavement marking enhancements will all be considered.
- To begin to identify areas of concern and potential counter measures that may apply to the larger corridor project.

4) Mark provided an introduction to Roadway Safety Audits which included the following points:
   - Systematic approach to reviewing safety concerns along a corridor.
   - Builds upon what has happened in the past i.e. crash history summarized in US 12 Corridor Study
   - Should be done by an independent\multi-discipline team
   - Includes identifying countermeasures that may enhance safety and looking at the economic aspects of the solution as well as the effectiveness given field conditions.
5) Mary Beth indicated that the purpose of this kick-off meeting is to listen to those present at the meeting. Invited attendees have significant experience along the corridor, and the audit team is interested in hearing any thoughts people may have with regards to safety concerns along the corridor. The following comments were offered during the general discussion session:
   - Tom mentioned that there are two primary types of crashes along the corridor:
     1. Bicycle and pedestrian
     2. Rear End crashes in high traffic areas.
   - Police officers assist the Tommy Bartlett Show in managing traffic during show times.
   - Noah's Ark often uses police assistance in the morning to help traffic entering the attraction.
   - Perry indicated that the Dells had significant traffic concerns in the Mt. Olympus area during some of the promotional weekends (free entrance).
   - Discussion regarding the bicycle\pedestrian crashes included the following:
     1. The Village of Lake Delton allows cycling on the sidewalks for all ages. They would like to work to educate people to bike on the sidewalk in the direction of travel.
     2. The City of Wisconsin Dells does not allow bicycles on the sidewalk.
     3. Larger tourist areas invite international works from locations around the world where bicyclists are respected by drivers. Students often view our regulatory "STOP" sign as a yield sign. The City of Wisconsin Dells has a video to help educate people on bicycles safety.
     4. Tom has witnessed two bicycle crashes while assisting

with traffic at the show entrance. Neither of these were likely reported because no one was hurt. This would indicate that there is a very high number of unreported incidents along the corridor.

5. Tom mentioned that the Village is working with the Wisconsin Dells Visitor and Convention Bureau to require business owners to have programs that educate these students on bicycle and pedestrian rules in America. He indicated that the Wilderness has a good program in place and is an example of what they are trying to implement on a Village wide basis.
6. These students are often from many countries and are here on 90-day work Visas. Students speak multiple language and are not always familiar with standard signs and markings used in the USA. A **J-1 visa** is a non-immigrant visa issued by the United States to exchange visitors participating in programs that promote cultural exchange, especially to obtain medical or business training within the U.S. All applicants must meet eligibility criteria and be sponsored either by a private sector or government program.
7. Village of Lake Delton police are somewhat hesitant to issue tickets due to steep fines, is looking into opportunities to enhance enforcement of laws.
8. There are likely 4,000-5,000 of these students working in the area at the peak period of the summer.
9. Some attendees feel the bicycle\pedestrian concern along the corridor is mostly a local concern and that the DOT can assist by allowing them to provide signs within the public right-of-way that may enhance safety. The concern with signing is that it often does not translate amidst languages, universal markings may offer a solution.
10. Tom mentioned that some signage and pavement marking has been added near the Original Ducks to alert bicyclists of the driveways. It was mentioned that that the Village would like to put up "stop" signs for the cyclists.

- The mix of international workers and tourism causes a non-uniform driver culture along the corridor.
- Tom indicated that Clara Avenue represents the next area of concern for safety in the area. There is no painted centerline and the roadway is narrow.
- Attendees agreed that education of signs and markings along the corridor is an important component of achieving better safety along the corridor.
- All US 12 users are not paying attention to the "rules of the road" – they tend to be 100% on vacation and do not concentrate on driving.
- Tom mentioned that long term solutions should include redevelopment considerations, frontage roads, and driveway closures. Raine mentioned that the corridor could benefit from

consideration of "Michigan Lefts". There is some support for the one-way pair option from a safety perspective.

1. Tom made reference to Pigeon Forge near Gatlinburg, TN as an area that faced similar challenges and found solutions.

- How has the corridor changed over the years?
    1. Structures are too close to the roadway
    2. There has been consolidation of ownership of some properties.
    3. Noah's Ark access to Lake Avenue helped alleviate crashes along US 12 significantly.
    4. The Village is making progress with sign restrictions to try to reduce the number of signs along the corridor.
    5. The City and Village have worked together to get street names consistent in the area. This entire stretch of US 12 is now known as Wisconsin Dells Parkway a.k.a. The Strip.
    6. The speed limit is 35 mph year round. At one time, it was 45 mph during off peak tourist months.
- US 12 Pedestrians Cross Comments:
    1. A pedestrian overpass should be considered for the corridor. Mary Beth indicated this will be part of the corridor study. The team will look at pedestrian patterns as well as nodes for pedestrian movement and determine if there are appropriate locations along the corridor that would benefit from an overpass. Raine mentioned underpasses should also be considered but the appropriate safety measures would need to be included. i.e. lighting
    2. If a crosswalk is added to the corridor, advanced signage should be used (possible overhead).
    3. Tom does not think adding mid-block crossings that are not signalized are a safe solution for this corridor.
    4. Chris mentioned that the lights in the cross walks in the Dells work well but require significant maintenance. He estimates that the entire group of lights in likely replaced during a two-year time frame.
    5. General concern regarding how you get people to cross at a specific location without a median and Vegas style railing down the middle to prevent crossing at other locations.
    6. Perry mentioned that the Dells have provided some railings at Broadway & Eddy to focus pedestrian crossings at a single location.
    7. Many people cross near Noah's Ark and Mt. Olympus. Many of the international workers live on the east side of US 12 and cross over to Mt. Olympus, there is a lot of activity at the BP station at the intersection of CTH A.
    8. Attendees expressed concerns of whether beacons will be seen amidst other signing along the corridor.
    9. Wisconsin Dells received a grant to enforce pedestrian

safety, they used officers on foot to patrol pedestrians.

- Pavement Marking Comments
    1. If Cross Walks are painted on US 12, they need to be bold and should consider including "New York Style" markings, large blocks that driver can easily see.
    2. Painting the speed limit on the roads has worked along other corridors.
- Congestion Comments
    1. Congestion is not seen as a significant concern except on the following days:
        1. The four Saturday's in late July\early August that are the peak season
        2. Annual Car Show
        3. Promotional Days (Free Admission) at Mt. Olympus
    2. Rear ends collisions are a problem because the roadway basically functions as a two-lane roadway due to all the left turns and driveways.
    3. On busy Saturday's, Tom allows traffic looking to go to Noah's Ark to go through the Tommy Bartlett parking area, and use Nixon Street to E. Lake Avenue to park in the south lot. The Express Entrance to Noah's Ark is not used much.
- Roadway Improvements
    1. Village changed Hiawatha to only allow a right-out (they eliminated left-out). They plan to do this at E. Adams Street as well as part of the 2013 improvement along Wisconsin Dells Parkway South.
    2. Village is interesting in making this change at Pilgrim Drive as well at Mr. Pancake House. The GRAEF team will evaluate the feasibility of adding this to the resurfacing project.
    3. Raine indicated the Village will be doing some curb improvement sand storm sewer improvements this fall along Pilgrim Drive.
- Transit\Shuttle Comments
    1. The Village has made multiple attempts at running a shuttle along The Strip, none of them have succeeded.
    2. Tourists are in a love affair with their car and want to drive. They also want to be able to access anything that they may need from their car while at the Water Park.

- Inattentive drivers are a concern along the corridor.
- GPS has assisted with drivers be able to find destinations easier instead of looking for signage.
- The Village worked on a signing policy through the Visitors Bureau. Many of the ideas were not approved by the DOT so the plan was not implemented. Tom thought the study was performed by Roger Brooks out of the Seattle area.
- Kay commented that it would be nice to bury the electric underground as part of the larger corridor contract.

GRAEF to investigate eliminating left-out of Pilgrim Drive as part of resurfacing project.

Tom to provide study team copy of signing study performed for the Village.

All attendees to submit any further comments on the corridor to Mary Beth either via email or telephone.

- Tom followed up the meeting with a comment that the roadway lighting should be evaluated along the corridor – there are some "dark" spots that cause safety concerns.

1:30 PM – 3:30 PM US 12 Field Review / Consultant Review Team
Following the kick-off meeting the consultant review team walked the US 12 corridor from Hiawatha Drive to CTH A and noted the following observations:

1) US 12 corridor Study, 2011 Identified 6 Priority locations where crashes have been significant, they include the following:
    a. Location #1 – Lake Avenue
    b. Location #2 – Pizza Pub / Marley's (Now Club Wett)
    c. Location #3 – Mt. Olympus Resort
    d. Location #4 – Original WI Ducks South Entrance
    e. Location #5 – Original WI Ducks North Entrance
    f. Location #6 – CTH A

2) The following observations were noted by the team in the field review of these locations:
    a. Location #1 – Lake Avenue
        i. Concerns at this location may be due to a combination of a signal, on a horizontal curve, with a non-conforming geometric design.
        ii. Lack of dedicated turn lanes likely cause of many accidents.
        iii. Signals are difficult to see. Sight distance is poor on many corners.
        iv. Pedestrian push buttons for signals appear to be placed backwards and are not conveniently located for pedestrians on the sidewalk.
        v. Some pedestrian push buttons are not accessible from the sidewalk.
        vi. Traffic Signal only has protected left-turn phase in the southbound direction. The northbound left turn does not have safe sight of opposing southbound traffic. Likely most of the lefts are taking place on the amber. (This could be confirmed easily if a few cycles are observed when lefts are taking place.)

    b. Location #2 – Pizza Pub / Marley's (Now Club Wett)
        i. Many private signs off roadway in this location.
        ii. Roadway lighting seems inconsistent, could cause vision concerns at night.
        iii. Too many access points in close proximity to one another.
        iv. Sidewalk is inconsistent and not clearly marked. In areas of wide driveways, sidewalk seems to disappear.
    c. Location #4 – Original WI Ducks South Entrance
        i. Steep grade likely influences excessive speed along section of roadway.
        ii. Multiple driveways and multiple signs could confuse drivers

of where to enter.

d. Location #5 – Original WI Ducks North Entrance
    i. Traffic coming over the crest curve heading southbound is a concern when left turning vehicles to the original Wisconsin Ducks are queued.
    ii. Steep grade likely influences excessive speed along section of roadway.
    iii. Deceleration distances are compounded by the steep grade. Frequently drivers in the left lane make abrupt lane changes. The conflict pattern has the second or third vehicle needing to brake hard when the first vehicle following a left turner abruptly changes lanes.
    iv. Multiple driveways and multiple signs could confuse drivers are where to enter.
e. Location #6 – CTH A
    i. Crosswalks at this location are not used by pedestrians to the south; they don't want to go "out of the way" to cross at the light.
    ii. Pedestrian push buttons for signals appear to be placed backwards and are not conveniently located for pedestrians on the sidewalk.

3) Other observations along the US 12 corridor were noted as follows:
    a. Sight distance at Pilgrim Drive is obstructed by the Mr. Pancake Building and sign.
    b. A family was witnessed crossing US 12 from the Paradise hotel to Mt. Olympus.
    c. The speed of cyclists heading down grade in front of US 12 is a safety concern. (Markings have been placed on the sidewalk and a sign is placed indicating "Caution Driveways Ahead")
    d. Speed limits signs along the corridor are oversized. Appear 36"x48" (or larger) – likely done to compete with other signage along the corridor.
    e. Curb is only painted yellow in the limits of the Village.
    f. Some utility poles are located within the 1.5'-2' lateral clearance.
    g. Many private flashing/ animated signs throughout the corridor.
    h. Brews Landing Shuttle witnessed along the corridor.
4) Summary:
    a. Generally, the access spacing is characteristic of a low speed urban roadway. This is inconsistent with the speed and function of this highway. The horizontal and vertical alignment is not consistent with the character of urban development and the proximity or spacing of access. Speed of traffic is not compatible with the roadside and hidden conflicts exist for the left lane where frequent stops impede through traffic.
    b. The sidewalks are unusually close to the roadway and too narrow for shared use. Drivers have difficulty setting up for egress while needing to attend to the presence of pedestrians on the sidewalk. Moreover, numerous cyclists compound the motorists driving task of gap seeking in moderately fast roadway traffic. Driver

expectancies are violated by cyclists traveling on the sidewalk in the wrong direction w.r.t. motorists making lefts into driveways.

c. Driveway profiles are not smooth and flat requiring additional care and slowed driveway ingress and egress. This is compounded by pedestrians and cyclists.
d. Navigation and way-finding is likely impeded by excessive roadside information. A signing scheme that varies food from attractions from accommodations may improve way-finding.

Chief Dorner of the City of Lake Delton offered the following comments a week following the kick-off meeting. He indicated that he hoped some of these cold be considered for the fall 2012 mill & overlay project.

- Maintain "oversized" speed limit signs and add more if needed. Signs should be placed in a logical sequence, consider placing no parking signs beneath the speed limits signs.
- The design team should work with the City and the Village to upgrade the street name signs to comply with current standards.
- The design team should consider adding advance street name signage to the corridor. Add the street name signs to the overhead traffic light arms at Lake Avenue (and possibly CTH A if the City is interested).
- Locations where pedestrian frequently cross US 12 consideration should be given to overhead signs with flashers as well as pavement marking upgrades. Chief Dorner provided a mark-up to the corridor map indicating locations where he feels crossings should be studied. These include:
    1. E. Adams Street
    2. Newsome Lane
    3. Hiawatha Drive
    4. Pilgrim Drive\Noah's Ark Area
    5. Somewhere between Pilgrim Drive and CTH A – this is a crossing concern particularly for patrons of Skyline Motel and Paradise Motel going to Mt. Olympus.
- Consider adding signage to sidewalk that indicates the bicycles and pedestrians are both allowed to the use the sidewalk (only in the Village).

Next Steps

- Study team will further review field conditions and crash reports to identify counter measure appropriate for the resurfacing project. Once alternates are evaluated, a report summarizing concepts will be distributed for comment by local officials and law enforcement.

Summary of Action Items:

GRAEF (Consultant Team)

1) Evaluate field conditions, study crash reports, and identify counter measures for considerations. GRAEF to investigate eliminating left-out of Pilgrim Drive as part of resurfacing project.

Tom Diehl

1) Tom to provide study team copy of signing study performed for the Village.

All Attendees

1) All attendees to submit any further comments on the corridor to Mary Beth either via email or telephone.

If you have any questions regarding the contents of these minutes, please contact me directly at (414) 266-9175.

Respectfully Submitted,

Mary Beth Pettit, P.E.
Project Manager

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cc: All Attendees