

DAC comments

Rich Herrick will come separate

CORRESPONDENCE/MEMORANDUM _____ State of Wisconsin

Date: July 14, 2015

To: Beth Cannestra, P.E.
Director, Bureau of Project Development
Attn: Don Gruel, P.E.

From: Olubunmi Olapo, P.E.
WisDOT Southeast Region

Subject: DESIGN STUDY REPORT
Project I.D. 2788-00-01
USH 18
Waukesha Bypass
Genesee Road to Madison Street
Waukesha County

Having considered the economic and social effects of this project, its impact on the environment, and its consistency with the goals of community planning, we request your approval of the attached design study report.

Region Project Development Chief Date

Concur:

Bureau of Project Development, Date
Project Services Chief

DESIGN STUDY REPORT

1.0 PROJECT DESCRIPTION AND NEED

The proposed Waukesha Bypass project consists of construction on new alignment and reconstruction/expansion on existing alignment as a multi-jurisdictional project under a signed Memorandum of Understanding between WisDOT, City of Waukesha, Town of Waukesha and Waukesha County. The Environmental Impact Statement was completed for the entire Waukesha Bypass project and the Record of Decision was signed by FHWA on January 20, 2015.

This DSR covers project ID 2788-00-01, which encompasses the proposed construction on new alignment from Genesee Road/Les Paul Parkway to 500 feet north of Madison Street, with construction scheduled for late 2016 & 2017. The proposed roadway will be designated USH 18.

1.1. Federal Oversight Project (Yes or No): Yes

1.2. Project Length & Termini

Project Length: 3.04 miles

Termini/Limits:

The proposed project is located in the City and Town of Waukesha in Waukesha County. The project extends from the current intersection of Genesee Road (STH 59/CTH X) & Les Paul Parkway (STH 59) to 500 feet north of Merrill Hills Road (CTH TT) & Madison Street.

See Attachment 1 – Project Location/Overview Map

1.3. Functional Classification/Access Control

Roadway Name	Functional Class (Arterial, Collector or Local)	Rural, Urban or Transitional	Corridors 2020 or Backbone (No or State which)	NHS Route (Yes or No)	Long Truck Route (No or state Federal or State)	Access Control Tier	On Ped. Trans. Plan (Yes or No)	On Bike Trans. Plan (Yes or No)
USH 18	Arterial	Transitional	No	Yes	No	2A	Yes	Yes

1.4. Need for the Project

The need for the project is demonstrated through a combination of factors that include regional/local transportation and land-use planning, traffic demand, safety concerns, existing roadway deficiencies, and system linkage.

Regional and local transportation system plans document the importance of CTH TT/Meadowbrook Road as a north-south arterial and the need for capacity expansion. Based on predicted growth in population and employment, residential and commercial development, and vehicle miles traveled in Waukesha County, regional and local transportation system plans recommend that CTH TT/Meadowbrook Road be reconstructed as a 4-lane roadway.

Traffic on CTH TT/Meadowbrook Road in the project area is expected to increase 24 to 128 percent above the 2009 traffic volumes, based on projected growth trends.

From 2009 through 2013, 117 crashes occurred along the corridor. The crash rate on CTH TT from Sunset Drive to Madison Street exceeded the statewide average crash rate for similar roadways during that period.

The project corridor consists of roadways of varying characteristics with posted speed limits from 25 to 45 miles per hour. Substandard horizontal and vertical curves, high number of access points, narrow shoulders, and substandard stopping sight distance and intersection sight distance adversely affect traffic operations and safety.

The gap in the circumferential route around the city of Waukesha creates increased demand on local roads and impedes the flow of people and goods into and out of the area. A more reliable north-south arterial on the west side of Waukesha is necessary to connect the area south of Waukesha with I-94.

2

2.0 PRESENT FACILITY

2.1. Posted Speed

Roadway or Roadway Segment	Posted Speed	Advisory Speed
Merrill Hills Road (CTH TT), Sunset Drive to Madison Street	45 mph	30 mph (railroad crossing)

Says 25-45 in Need...

2.2. Geometrics

2.2.1. * Horizontal Alignment Features Outside of Desirable or Minimum Design Standards.

* Horizontal Feature (Curve, P.I. Deflection, etc.)	Location (Stationing)	* Size (Radius, P.I. Deflection, etc.)*	* Super-Elevation (s.e.)	Speed Rating
Curve	136+21	R=800'	2.0%	<25 mph
Curve	170+70	R=800'	2.0%	<25 mph

*Controlling Criteria

Comments:

See Attachment 2 – Existing Geometry.

2.2.2. * Vertical Alignment Features/SSD Outside Desirable or Minimum Design Standards.

* Vertical Feature (Curve, Vertical Grade Deflection, etc.)	Location (Stationing)	Sag or Crest	* % Grades	K Value/ Grade Deflection	Speed Rating	* SSD** Met (Yes or No/ Length)	DSD Met (Yes or No/ Length)
Curve	97+21	Sag	-3.83%/ -2.00%	K=109	50mph	Yes/425'	No/425'
Curve	130+30	Crest	4.81%/ -0.39%	K=53	40mph	No/305'	No/305'
Curve	136+09	Crest	-0.39%/ -5.08%	K=43	35mph	No/250'	No/250'
Curve	137+99	Sag	-5.08%/ -2.01%	K=49	35mph	No/250'	No/250'
Curve	139+87	Crest	-2.01%/ -3.79%	K=56	40mph	No/305'	No/305'
Curve	153+71	Crest	3.47%/ 0.62%	K=53	40mph	No/305'	No/305'
Curve	155+70	Sag	0.62%/ 2.68%	K=24	<25mph	No/<155'	No/<155'
Curve	156+66	Crest	2.68%/ 0.67%	K=25	30mph	No/200'	No/200'
Curve	158+35	Crest	0.67%/ -5.19%	K=21	30 mph	No/200'	No/200'
Curve	160+74	Sag	-5.19%/ -3.53%	K=30	25 mph	No/155'	No/155'
Curve	162+43	Crest	-3.53%/ -5.91%	K=21	30 mph	No/200'	No/200'
Curve	164+98	Sag	-5.91%/ 5.21%	K=31	25 mph	No/155'	No/155'
Curve	169+69	Crest	5.21%/ -3.52%	K=40	35 mph	No/250'	No/250'
Curve	172+29	Sag	-3.52%/ -0.70%	K=35	25 mph	No/155'	No/155'
Curve	175+14	Sag	-0.70%/ 10.31%	K=16	<25 mph	No/<155'	No/<155'
Curve	176+28	Crest	10.31%/ 7.34%	K=17	25 mph	No/155'	No/155'
Curve	178+50	Crest	7.34%/ -2.65%	K=23	30 mph	No/200'	No/200'

*Controlling Criteria

**SSD = Stopping Sight Distance

Comments:

Desirable and Minimum Stopping Sight Distances are listed below per FDM

SSD_{des/min}: 25 mph = 155', 30 mph = 200', 35 mph = 250', 40 mph = 305', 45 mph = 360', 50 mph = 425'

See Attachment 2 – Existing Geometry.

2.2.3 * Grades and Vertical Clearance Outside Desirable or Minimum Design Standards.

Location (Stationing, Overpass Structures, etc.)	* % Grade	* Vertical Clearance
118+44 to 119+69	5.61%	-
128+00 to 128+06	7.77%	-
137+09 to 137+24	-5.08%	-
158+98 to 160+49	-5.19%	-
162+68 to 163+23	-5.91%	-
166+73 to 167+94	5.21%	-
176+01 to 176+02	10.31%	-
176+53 to 177+38	7.34%	-

*Controlling Criteria

Comments:

See Attachment 2 – Existing Geometry.

5% map for urban arterial level terrain

2.3 Side-Roads/Intersections/Interchanges

2.3.1 Side-roads

Roadway Name	Functional Class	Posted Speed (MPH)	Existing Traffic*** (AADT)	Approach Grades	Pedestrian Facilities (Yes or No)	Bicycle Facilities (Yes or No)
Saylesville Road (CTH X)	Minor Arterial	35 mph	13,100	3.2%	No	No
Genesee Road (STH 59)	Principal Arterial	45 mph	12,600	2.7%	No	No
Genesee Road (CTH X)	Principal Arterial	45 mph	19,900	3.1%	No	Yes
Sunset Drive (CTH D)	Principal Arterial	45 mph	12,600	6.6%	No	No
Green Lane	Local Rd	35 mph	1,400	1.7%	No	No
MacArthur Road	Collector	35 mph	1,300	2.7%	No	No
Kame Terrace	Local Rd	25 mph	>100	5.7%	No	No
Madison Street	Collector/ Minor Arterial	35 mph	700 West/ 3,300 East	1.9%/5.8%	Yes	No

***If Existing Traffic volumes are not available, then state at a minimum whether AADT is assumed to be <100 or >100.

Comments:

2.3.2 Intersections

Intersecting Roadway Names	Intersect Type	Intersect Angle	Traffic Control	* SSD** Met [(Y/N) / Length]	ISD** Met [(Y/N) / Length]	DSD** Met [(Y/N) / Length]	Vision Triangle (Y/N)	Corner Clearance To Driveways Present (Y/N)
Les Paul Parkway/ Genesee Road/ Saylesville Road	4 Legs/ Urban	85	Signals	No/250'	No/435'	No/250'	No	No
Merrill Hills Road/ Green Lane	3 Legs/ Rural	76	1 Way Stop	Yes/305'	No/445'	No/305'	No	No
Merrill Hills Road/ MacArthur Road	3 Legs/ Rural	89	1 Way Stop	Yes/250'	No/100'	No/450'	No	No
Merrill Hills Road/ Kame Terrace	3 Legs/ Rural	90	1 Way Stop	Yes/200'	No/690'	Yes/450'	No	No
Merrill Hills Road/ Merrill Hills Court	3 Legs/ Rural	90	1 Way Stop	Yes/200'	No/555'	No/200'	No	No
Merrill Hills Road/ Madison Street	4 Legs/ Urban	80	4 Way Stop	No/155'	Yes/100'	No/155'	No	Yes

*Controlling Criteria

**SSD=Stopping Sight Distance, ISD=Intersection Sight Distance, and DSD=Decision Sight Distance (See FDM 11-25-1).

Comments:

ISD shown is for passenger car.

Has intersection control evaluation (ICE) worksheet been coordinated (Yes or No)? Yes, see Attachment 12 – Intersection Control Evaluation

2.3.3 Interchanges

Intersecting Roadway Names	Interchange Type	Ramp Types	Ramp Design Speed	Horizontal Curve on Ramp	Vertical Curve on Ramp	Ramp Grades	* SSD** [(Met (Y/N) / Length]	DSD** [(Met (Y/N) / Length]
None								

*Controlling Criteria

**SSD = Stopping Sight Distance & DSD = Decision Sight Distance (See FDM 11-25-1).

Comments:

No interchanges exist within the project limits.

2.4 Cross Section

See Attachment 3 – Existing Typical Cross Sections

Number of roadways: 1

Number of lanes: 2

Median width: None

* Lane width: 12'

* Shoulder width (Total and Paved or Curb & Gutter): varies 3' to 10' / 0' to 3' paved

Bicycle Facility Type: None

Sidewalk and curb ramps: None

* Cross slope: 2%

* Super-elevation: 6% maximum

* Horizontal clearance: 2' minimum

Clear Zone: varies – 5' to 30'

* Vertical clearance: No vertical obstruction

Side-slopes and Ditch sections: varies 3:1 to 6:1 / v-ditch typical

*Controlling Criteria

2.5 Pavement Structure/Condition

Roadway	Pavement Types & Thicknesses	Physical Description
Merrill Hills Road (CTH TT), Sunset Drive to Madison Street	Approx. 5" HMA	Fair to good condition. Some areas of distressed pavement, including longitudinal, transverse, and alligator cracking and rutting.

2.6 Right Of Way

2.6.1 Encroachments

See Attachment 4 – List of Encroachments

2.6.2 Unique Right of Way Issues:

None

2.7 Structures

Existing Structure I.D. #	Feature Crossed	Structure Type	Sufficiency Rating	* Clear Roadway Width	Railing Type	* Structurally Deficient or Functionally Obsolete	* Inventory Load Rating
B67-0038	Genesee Road over Pebble Creek	Deck Girder	54.4	40.0'	Concrete	Structurally Deficient	HS17
B67-0221	Sunset Drive over Pebble Creek	Flat Slab	97.5	44.0'	Steel	No	HS24
B67-0270	Merrill Hills Road over Pebble Creek	Flat Slab	94.7	40.0'	Steel	No	HS23

*Controlling Criteria

Comments: See Attachment 1 – Project Location/Overview Map

not in this project

done

2.10 Special Soils Conditions

A Phase 1 Subsurface Investigation was completed and indicated potential contaminated soil/groundwater locations. Four (4) Phase 2.5 Investigations are currently being conducted. Special provisions will be included in the contract to instruct the contractor as to the appropriate removal, dewatering and disposal methods required for any contaminated soils or groundwater discovered during construction.

An area of shallow groundwater flow was identified in the vicinity of Pebble Creek north and south of Sunset Drive. Along the hillside south of Sunset Drive, shallow groundwater flows west to east toward Pebble Creek. Excavation below subgrade may be required in areas where poor soil conditions are identified.

2.11 Unique Project Features

Waukesha County is responsible for preliminary design of this project. Final design and construction will be led by WisDOT.

3.0 TRAFFIC

3.1 Traffic Volumes/Conditions

3.1.1 See Attachment 5 – Traffic Forecast Report

3.1.2 Highway Capacity Analysis

Location (Roadway Segment or Intersection)	Existing Level of Service		Design Year Level of Service Under Existing Roadway		Design Year Level of Service Under Proposed Roadway	
	AM	PM	AM	PM	AM	PM
Les Paul Parkway & Genesee Road & Saylesville Road	C	C	E	C	N/A	N/A
Genesee Road & Saylesville Road	N/A	N/A	N/A	N/A	C	B
Les Paul Parkway & Genesee Road	N/A	N/A	N/A	N/A	D	D
Sunset Drive & Bypass	N/A	N/A	N/A	N/A	B	B
Merrill Hills Road & Sunset Drive	B	C	D	D	N/A This intersection will still exist. Can we determine LOS?	N/A
Merrill Hills Road & Madison Street	F	F	F	F	B	B

Comments:

Design year analysis needs to be updated based on finalized horizontal geometry-waiting on WisDOT traffic model.

Need corridor LOS

3.2 Crash Analysis

3.2.1 Project Crash Information – Preliminary Crash Data 2009 to 2013

Roadway	Crash Rate ⁽¹⁾ (Year.)	Statewide Crash Rate ⁽¹⁾ (Year)	Number & Severity of Crashes			
			Fatal	Injury	Property Damage	Total No. Crashes
Merrill Hills Road (South of Sunset Drive to north of Madison Street)	321 (2009-2013)	108 (2009-2013)	1	31	85	117

⁽¹⁾ Crash rate based on 100 million vehicles miles traveled (100 MVMT)

Comments:

Segment crashes include all crashes at intersections within segment.

Statewide Crash Rate comparison for this segment is the Rural County Highway average from 2009-2013.

3.2.2 Significant Crash Locations or Patterns – Preliminary Crash Data 2009 to 2013

Location or Pattern	Year	Number & Severity of Crashes				Crash Rate ⁽²⁾	Possible Factors Contributing to Crashes
		Fatal	Injury	Property Damage	Total		
Les Paul Parkway & Genesee Road & Saylesville Road	2009- 2013	0	11	44	55	0.92	No specific pattern identified
Merrill Hills Road & Madison Street	2009- 2013	1	5	27	33	1.28	Vertical curve located north of the all-way stop control intersection 23 of the 33 crashes were rear end

⁽²⁾ Crashes per million entering vehicles (MEV)

Comments:

The crash rates for all other intersections are not significant, below 0.75 crashes per MEV. Typically 1.5 crashes per MEV is the threshold used as a flag for safety improvements.

4.0 PROPOSED DESIGN CRITERIA

4.1 Design Class

Roadway or Roadway Segment	Design Class
USH 18, Genesee Road to Madison Street	UA3

4.2 * Design Speed

Roadway or Roadway Segment	Design Speed	Posted Speed
USH 18, Genesee Road to Madison Street	50 mph	45 mph

* Controlling Criteria

*discuss how determine design speed
match section to East.
Coordinate w/ SE operations*

4.3 Design Criteria Outside Of Desirable Standards

Design Speed

A design speed equal to the posted speed limit was used for MacArthur Road at the approach to USH 18. The use of a minimum design speed equal to the posted speed is acceptable according to FDM 11-20, Attachment 1.1 (footnote 3). The minimum design speed was used in this location because desirable and minimum vertical curve requirements could not be met for the higher design speed. This is an approach to a stop-controlled intersection, therefore the operating speed is lower. There is no notable crash history at this location.

Design speed-if Green Ln north alt is chosen.

Curb Offset

The median curb offset along Genesee Road, from STA 52+00 to STA 62+00 is 4 feet, which is less than the desirable 2 feet, but greater than the minimum 1.8 feet. This dimension matches the recently reconstructed roadway to the northeast. This is a county road (CTH X) and Waukesha County approves this design.

Vertical Curves

The crest vertical curve on northbound USH 18 at STA 107+94 (K=137.70) does not meet the desirable K-value of 261 (sight distance category 2 due to dual left turn lanes); however, the minimum criteria (K=84) is met. The category 1 desirable criteria (K=136) is also met. The desirable K-value could be met by either lengthening the curve or reducing the approach/departure grades. Both of these options would result in extending the project limits to the east and greater wetland fill on the south side of the roadway. Additionally, the departure grade cannot be flattened because it is required as superelevation for the cross road (Genesee Road).

The crest vertical curve on westbound Genesee Road (CTH X) at STA 53+40 (K=141.16) does not meet the desirable K-value of 261 (sight distance category 2 due to dual left turn lanes); however, the minimum criteria (K=84) is met. The category 1 desirable criteria (K=136) is also met. The desirable K-value could be met by either lengthening the curve or adjusting the approach/departure grades. The approach grade is fixed by the location of the proposed bridge over Pebble Creek. Increasing the departure grade would negatively impact the USH 18 profile and would result in greater wetland impacts on the west side of Genesee Road.

A single run of median barrier is proposed from approximately STA 120+00 to STA 147+00. The desirable two runs of barrier are not feasible because it would require a wider section through this environmentally sensitive corridor. No lighting is proposed in the median and minimal median signs will be required, therefore there will be a minimal risk of collisions with fixed objects on top of the barrier.

Turn Lane Length

The westbound dual left turn lane on Genesee Road at Saylesville Road is shorter than the desirable length. The left lane meets the desirable length of 425 feet, but the right lane has a length of 200 feet, which accommodates the queue in the design year. This shorter length is required due to the close proximity between Saylesville Road and USH 18. ~~There is no existing crash pattern at this location.~~ *New location doesn't correlate.*

The eastbound left turn lane on Genesee Road at USH 18 has a length of 287 feet, which is shorter than the desirable length of 355 feet, but meets the minimum length of 225 feet. This shorter length is required due to the close proximity between Saylesville Road and USH 18. ~~There is no existing crash pattern at this location.~~

The westbound dual left turn lane on Genesee Road at USH 18 is shorter than the desirable length. The left lane meets the minimum length of 290 feet. The right lane has a length of 146 feet, which accommodates the queue in the design year. This shorter length is required because of the location of the proposed bridge over Pebble Creek. The proposed bridge geometry will not allow the turn lanes to extend onto the bridge. ~~There is no existing crash pattern at this location.~~

The westbound right turn lane on Genesee Road at USH 18 has a length of 280 feet, which is shorter than the desirable length of 350 feet, but meets the minimum length of 225 feet. This shorter length is required because of the location of the proposed bridge over Pebble Creek. The proposed bridge geometry does not allow the turn lane to extend onto the bridge. ~~There is no existing crash pattern at this location.~~

Intersection Design/Check Vehicles

The required design vehicle (WB-65) for the intersection of USH 18 and Genesee Road does not meet the required degree of encroachment (A1) for vehicles turning from SB USH 18 to EB Genesee Road and from EB Genesee Road to NB USH 18. A degree of encroachment A2 is met, without conflicting with the opposing right turn movement. Accommodating the required degree of encroachment would require a larger intersection footprint, which is undesirable due to wetland impacts.

NB K=215 less desirable but w/in minimum @ RR

*11-25
table 2.3
free flow
radius
tangent
taper*

6.2

The required design vehicle (WB-65) for the intersection of USH 18 and Sunset Drive does not meet the required degree of encroachment (A1) for vehicles turning left from Sunset Drive to USH 18. A degree of encroachment A2 is met. Accommodating the required degree of encroachment would require a larger intersection footprint, which is undesirable due to wetland impacts.

The required check vehicle (WB-65) for the intersection of USH 18 and Green Lane does not meet the required degree of encroachment (A2) for vehicles turning right from SB USH 18 to WB Green Lane. A degree of encroachment B2 is met. Accommodating the required degree of encroachment would require a larger intersection footprint, resulting in greater impacts on the surrounding area. The WB-40 can make this movement with a degree of encroachment A2. This side road is a local road serving a residential area, a church, and two businesses. Alternate access is available to the south on Sunset Drive.

The required check vehicle (WB-65) for the intersection of USH 18 and MacArthur Road does not meet the required degree of encroachment (A2) for vehicles turning right from NB USH 18 to EB MacArthur Road. A degree of encroachment B2 is met. Accommodating the required degree of encroachment would require a larger intersection footprint, resulting in greater impacts on the surrounding area. This side road is a local road serving a residential area, and is posted no trucks over 5 tons.

The required check vehicle (WB-65) for the intersection of USH 18 and Kame Terrace does not meet the required degree of encroachment (A2) for vehicles turning right from SB USH 18 to WB Kame Terrace. A degree of encroachment B2 is met. Accommodating the required degree of encroachment would require a larger intersection footprint, resulting in greater impacts on the surrounding area. The WB-40 can make this movement with a degree of encroachment A2. This side road is a local road with no other access points serving a residential area.

The required check vehicle (WB-65) for the intersection of USH 18 and Merrill Hills Court does not meet the required degree of encroachment (A2) for vehicles turning right from SB USH 18 to WB Merrill Hills Court. A degree of encroachment A3 is met. Accommodating the required degree of encroachment would require a larger intersection footprint, resulting in greater impacts on the surrounding area. The WB-40 can make this movement with a degree of encroachment A2. This side road is a local road with no other access points serving a residential area.

Add
Shoulders
inside
< 6' (5.83')

inside +
outside
< 10' (9.83')

4.4 Exceptions To Standards

None required

4.4.1 Safety Screening Analysis (SSA) and Programmatic Exception to Standards per FDM 11-1-4 (3R projects and Preventive Maintenance (PM) Group I and Group II pavement strategy projects (FDM 3-1 Exhibit 5.1))

See attached Safety Screening worksheets for locations and details of Crash Flags, Improvement Flags, and Programmatic Exceptions to Standards within the project limits.

****National Highway System (NHS) Roadway- Substandard Geometric Features Covered by a Programmatic Exception to Standards (3R & PM projects)***

NHS roadway name:

Location				Feature Type	Magnitude of Variance
Sta.	to Sta.	RP	to RP		

* This documentation is required only for 3R projects on the National Highway System.

Comments: This is not a 3R project and thus is not required for this project.

Substandard Geometric Features NOT Covered by a Programmatic Exception to Standards and NOT corrected as part of PM project (PM Group I and Group II pavement strategy projects)

Roadway Name:

Location				Feature Type	Magnitude of Variance	Operational Improvements
Sta.	to Sta.	RP	to RP			

Comments: This is not a PM project and thus is not required for this project.

4.5 Typical Cross Section Elements Considered

The proposed USH 18 roadway will be a divided section with two 12-foot lanes in each direction. Outside shoulders will provide bicycle accommodations. Left and right turn lanes will be 12 feet in width. Either a 10-foot rural shoulder (8-foot paved), or 10-foot paved urban shoulder including curb and gutter will be constructed. Inside shoulders are 6 feet with either curb and gutter or median barrier.

From the southern project limit to Genesee Road, the raised median width varies from 22 to 62 feet. In order to minimize roadway footprint through the environmentally sensitive southern segment from Genesee Road to Sunset Drive, a 14-foot median with concrete median barrier separates northbound and southbound traffic. North of Sunset Drive the typical raised median width is 30 feet (widens to 38 feet at Sunset Drive and Madison Street intersections).

Pedestrian Accommodations

A 10-foot wide multi-use path will be constructed on the east side of the roadway from Sunset Drive to the north project limit. Grading provisions will be made for a potential future sidewalk on both sides of the roadway from the southern project limit to Genesee Road and on the west side of the roadway from Sunset Drive to Kame Terrace. A 5-foot wide sidewalk will be constructed on the west side of the roadway from Kame Terrace to the north project limit.

No sidewalk or multi-use path will be constructed along the environmentally sensitive southern section (between Genesee Road and Sunset Drive) in order to minimize the proposed roadway footprint on the existing habitat and natural resources.

The "Wisconsin Guide to Pedestrian Best Practices" states that the minimum face to face median pedestrian refuge for new construction is 6 feet and 8 feet or more can better accommodate multiple pedestrians, bikes, strollers and wheelchairs. All median pedestrian refuges will measure at least 6 feet face to face. Pedestrian refuges at signalized intersections will measure at least 8 feet face to face.

5.0 PROPOSED DESIGN IMPROVEMENT

5.1 Improvement Type

Reconstruction / Expansion

Program Number: 303SE

5.2 Geometrics

5.2.1 * Horizontal alignment

Horizontal alignments including superelevation rates meeting current standards were used for both directions of travel along USH 18 and for all side roads.

See Attachment 6 – Preliminary Plan Sheets

inside and outside

9.83'

5.83'

6'

5.3.2 Intersections

Intersecting Roadway Names	Intersect. Type	Intersect. Angle	Traffic Control	* SSD** Met [(Y/N) / Length]	ISD** Met [(Y/N) / Length]	DSD** Met [(Y/N) / Length]	Vision Triangles Proposed (Y / N)	Corner Clearance To Driveways Met (Y / N)
Saylesville Road & Genesee Road	3 Legs urban	90	Signals	Y/>305'	Y/955'	Y/>600'	N	N
USH 18 & Genesee Road	4 legs urban	79	Signals	Y/>425'	N/800'	N/450'	N	N
USH 18 & Sunset Drive	4 legs urban	75	Signals	Y/>425'	Y/825'	N/450'	N	N
USH 18 & Green Lane	3 Legs rural	90	1- Way Stop (minor road)	Y/>200'	Y/950'	N/<375'	N	Y
USH 18 & MacArthur Road	3 Legs urban	90	1- Way Stop (minor road)	Y/>250'	Y/1135'	N/<375'	N	Y
USH 18 & Kame Terrace	3 Legs rural	90	1- Way Stop (minor road)	Y/>200'	Y/1135'	N/<375'	N	N
USH 18 & Merrill Hills Court	3 Legs urban	90	1- Way Stop (minor road)	Y/>200'	Y/1135'	Y/450'	N	Y
USH 18 & Madison Street	4 legs urban	85	Signals	Y/>250'	Y/920'	N/<375'	N	Y

*add
US 18
+ RR*

* Controlling Criteria

**SSD = Stopping Sight Distance, ISD = Intersection Sight Distance & DSD = Decision Sight Distance (See FDM 11-25-1).

Comments:

Intersection control evaluation (ICE) worksheet has been coordinated. Draft Scoping ICE Memo dated December 19, 2014; BTO scoping ICE comments January 13, 2015.

Intersection Sight Distance

ISD is shown for the design vehicle (SU or WB truck).

USH 18 & Genesee Road: Minimum ISD for the WB truck is not met for the right turn on red from WB Genesee Road to NB USH 18; 800 feet is available, rather than the minimum 825 feet.

*825 ?
775 !*

All other locations meet desirable or minimum ISD values.

5.3.3 Interchanges

Name of Intersecting Roadways	Interchange Type	Ramp Type	Ramp Design Speed	Ramp Grades	* SSD** Met [(Y/N) / Length]	DSD** Met [(Y/N) / Length]	Vision Triangle (Yes or No)
None							

* Controlling Criteria

**SSD = Stopping Sight Distance & DSD = Decision Sight Distance (See FDM 11—25-1).

Comments:

No interchanges exist within the project limits.

5.4 Roundabouts

Roundabout construction is not part of the recommended design. Traffic signals are recommended because, in several cases, it was determined that dual lane roundabouts would not provide an acceptable level of service. Triple lane roundabouts were not considered for this project.

See Attachment 12 – Intersection Control Evaluation

5.5 Cross Section/Pavement Structure

See Attachment 7 – Finished/Proposed Typical Cross Sections

Number of roadways: 2

Number of lanes: 2

Median width/Type: varies 14-62' / raised grassed median or median barrier

* Lane width/Type (Driving, Parking, Bike Lane, etc.):

12' driving lanes, 12' turn lanes, 10' shoulder (for bike accommodations, no parking)

* Shoulder width (Total & Paved or Curb & Gutter):

Urban – 6' left with curb and gutter, 10' right with curb and gutter

Rural – 6' left with curb and gutter, 10' right (8' paved)

Bike facilities proposed: Paved shoulder/multi-use path

Pedestrian facilities / sidewalk proposed: 5' sidewalk and 10' multi-use path

* Cross slope: 2% typical

* Super-elevation: 4% maximum

See comments below regarding non-standard cross slope locations.

* Horizontal clearance: 2' minimum (from face of curb)

* Vertical clearance: No vertical obstructions

Pavement Structure: 8-inch non-reinforced PCC over 6-inch Base Aggregate Dense 1-1/4" over 16" select crushed material

Clear Zone: 22'

Side-slope / Ditch Sections: 6:1 foreslope and 4:1 backslope typical

* Controlling Criteria

Comments:

Non-standard cross slope is used at the locations noted below:

USH 18:

At the Genesee Road intersection (STA 113+00) northbound and southbound lanes slope 2.0% to the right to create a smooth profile along Genesee Road.

At the Sunset Drive intersection (STA 152+50) northbound and southbound lanes slope 2.0% to the right to create a smooth profile along Sunset Drive.

At the Wisconsin & Southern Railroad (STA 174+00) northbound and southbound lanes are warped to match the railroad crossing.

At the bridge over the Pebble Creek (STA 179+00) northbound and southbound lanes slope 2.0% to the right to simplify bridge construction and transition into the horizontal curve north of the bridge.

At the Kame Terrace intersection (STA 221+50) northbound and southbound lanes slope 2.0% to the left to better match the intersection and reduce the cut on the east side of the roadway.

At the Merrill Hills Court intersection (STA 234+50) southbound lanes slope 2.0% to the right to better match the intersection.

At the Madison Street intersection (STA 255+00) northbound and southbound lanes slope 2.0% to the left to create a smooth profile along Madison Street.

Genesee Road:

At the USH 18 intersection eastbound and westbound lanes slope 2.8% to the left to match the intersection.

There is a potential for two noise wall locations along the corridor. Public meetings, comment and voting proceedings need to be completed in final design.

5.7.4 Sign Bridge Structures

Structure I.D. #	Location	Type	Length	Clear Roadway Width	* Vertical Clearance	* Horizontal Clearance	Clear Zone Under
	Proposed Improvement:						
	Proposed Improvement:						

* Controlling Criteria

Comments:

None currently proposed within the project. Further analysis is required to determine location and need.

5.7.5 Tunnel Structures

Structure I.D. #	Location	Type (Veh., Ped., Bicycle, etc.)	Length	Lighting Type	* Vertical Clearance	* Horizontal Clearance
None						
	Safety Features			Coordination with Local Emergency Responders		
	Proposed Improvement:					

* Controlling Criteria

Comments:

None proposed within the project.

5.8 Permanent Traffic Control

Will permanent signs be installed (Yes or No)? Yes

Are non-standard sign layout details needed (Yes or no)? Yes

Comments:

There is a potential need for non-standard sign layout details at the following locations:

- Saylesville Road & Genesee Road (NB to EB dual right turn)
- Genesee Road & Saylesville Road (WB to SB dual left turn)
- Genesee Road & Bypass (WB to SB dual left turn)
- Bypass & Genesee Road (NB to WB dual left turn)

Needs signed

5.9 Transportation Management Plan

See Attachment 9 – Transportation Management Plan Documentation

5.10 Safety Enhancements/Mitigation Measures

- Improved stopping sight distance.
- Improved Level of Service.
- Improved (coordinated) traffic signals with pedestrian accommodations.
- Additional through lanes will reduce congestion.
- New pavement will provide for a smoother ride and higher friction factor to reduce skidding.
- New curb and gutter and positively graded ditches will improve drainage.
- New pavement markings and permanent signing will meet current standards and increase driver awareness.
- New curb ramps with detectable warning fields will increase pedestrian safety.
- Pedestrian refuge will be provided in medians.

5.14 Financing And Scheduling

Construction I.D.	Construction Cost Estimate	Type of Funding			Proposed Timeframe For Construction	Ties to Other Work or Projects	Incentive/ Disincentive Clauses (Yes or No)
		% Fed.	% State	% Local			
2788-00-71	\$28.3M	80	20	-	2016-2017	None	No

Describe Incentive/Disincentive Clauses:

None

Non-participating Work:

Sanitary sewer and water main facility adjustments are anticipated in the project corridor.

Deferred Construction Work (Preventative Maintenance projects)

None

5.15 Unique Or Non-standard Features

5.15.1 Hazardous Waste

There are a total of four (4) hazardous material sites in the project area recommended for Phase 2.5 Subsurface Investigations. Special provisions will instruct the contractor as to the appropriate removal, dewatering, and disposal methods required for any contaminated soils or groundwater discovered. *done*

5.15.2 Environmental Commitments

No storage of materials or equipment will be permitted in wetland areas. Appropriate erosion control measures and best management practices will be included in the plan and implemented during construction. Silt fence and inlet protection will be installed prior to ground disturbing activities and maintained as needed. Special provisions for dust abatement will be used. Eco-passages will be included at the 3¹ proposed bridge locations. *P.C. and X*
See Attachment 8 – Impact Mitigation Measures

5.15.3 Community Sensitive Design/Public Involvement

A series of 5 Community Sensitive Solutions Advisory Group workshops were held between March 24, 2010 and January 31, 2011. A final meeting was held October 29, 2012. Public Involvement meetings were held May 18, 2010, July 14, 2010, August 4, 2010, and February 10, 2011. A Public Hearing was held on November 13, 2012. Future Public Involvement meetings are ongoing.

5.15.4 Value Engineering

Value Engineering was conducted March 2 through 5, 2015. See Attachment 13 – Value Engineering Study Report

6.0 SYNOPSIS

	Completion/Approval Dates	Status of Coordination or Other Information as Needed
Concept Definition Report	Not required for Project	Not required for Project
Scoping Document	Not required for Project	Not required for Project
Public Involvement Plan	March, 2010	Ongoing
Final Aesthetic & Visual Level of Impact Worksheet	FEIS	
Speed Limit Change Declaration	Not required for Project	Not required for Project
Environmental Document (Type: EIS)	September 11, 2014	ROD January 20, 2015
Public Hearing/Public Information Meetings	May 8, 2010 July 14, 2010 August 4, 2010 February 10, 2011 November 13, 2012	Ongoing
SHPO Involvement	Memorandum of Agreement April 2, 2014	Ongoing
DNR Involvement	Initial Concurrence December 3, 2013	Ongoing
Agricultural Impact Statement	November 30, 2012	Complete
Pavement Design Report	January 20, 2015	Complete
Roundabout Review (ICE Report)	January 13, 2015	Complete
Transportation Management Plan (Type: 2)	May 4, 2015	Approved
Permits Required (Types: GP & IP)	May 1 Expected November 1, 2015	Ongoing
Local Project Agreements: MOU	April 6, 2009	Ongoing Coordination
Value Engineering Study	March 2-5, 2015	Complete
Status of Statutory Actions	Jurisdictional Transfer After Construction	Pending
Trans 75 Documentation	September 10, 2013 April 17, 2015 Amendment	Complete

7.0 ATTACHMENTS

- 1 – Project Location/Overview Map
- 2 – Existing Geometry
- 3 – Existing Typical Cross Sections
- 4 – List of Encroachments
- 5 – Traffic Forecast Report
- 6 – Preliminary Plan Sheets
- 7 – Finished/Proposed Typical Cross Sections
- 8 – Impact Mitigation Measures
- 9 – Transportation Management Plan Documentation
- 10 – Roadside Hazard Analysis
- 11 – Trans 75 Documentation
- 12 – Intersection Control Evaluation
- 13 – Value Engineering Study Report