Project and Analyst Information:

Project ID:	6180-30-00
Project Type:	State Highway Rehabilitation Program
Location:	STH 21 and CTH FF/Reighmoor Road Town of Omro Winnebago NE Region
Analyst:	Camie Ferrier
Agency:	Westwood Infrastructure, Inc.
Date:	March 31, 2021

Background Information:

Project Need:	Safety
Project Objective(s):	The project objective is to improve the safety at the intersection of STH 21 and CTH FF/Reighmoor Road.
Additional Information:	The intersection of STH 21 and CTH FF/Reighmoor Road is included in a resurfacing project of STH 21, which begins south of Structure B-70-0051 within the City of Omro and continues to approximately Leonard Point Road. The existing form of traffic control is a minor road stop on CTH FF/Reighmoor Road while STH 21 has free flow traffic. The intersection geometry involves EB and WB both having a designated right turn lane while left turn and through share a lane. NB and SB both have a single lane approach. The speed limit is 55 mph on both STH 21 and CTH FF/Reighmoor Road.

Existing Crash Information:

Observed Crash History:

Years: 2014 - 2018

Crash Type	Fatal	Injury A	Injury B	Injury C	KABC	PDO	Total
Right Angle Crash			1		1		1
Rear End Left Turning Vehicle	1		2	2	5	1	6
Left Turn Failure to Yield				1	1		1
Rear End					0	1	1
Head On			1		1		1
Ditch				1	1		1
Total	1	0	4	4	9	2	11

Injury A – Suspected Serious Injury
Injury B – Suspected Minor Injury
Injury C – Possible Injury
KABC – Fatal (K) and Injury A, B and C
PDO – Property Damage Only

Crash Trends:

Left turning vehicles on STH 21 appear to be a factor in 6 of the 11 crashes. For these crashes, STH 21 through traffic rear ends traffic that is planning to turn left.

Contributing Factors:

Currently, left turn lanes do not exist on STH 21. Another factor may be difficulty selecting adequate gaps when crossing or turning left.

Additional Modes of Transportation:

Mode	Need? Yes/No	Nearby Generators and Existing Facilities	Volume	
			#	Unit
PED/BIKE	Yes	None	N/A	
OSOW	Yes	None		vph

(add more rows as needed)

Other Information: STH 21 in the area of this project is recommended to be part of the Oshkosh MPO Regional Bicycle & Pedestrian Network as shown in the Appleton (Fox Cities) Transportation Management Area & Oshkosh Metropolitan Planning Organization Bicycle and Pedestrian Plan – 2014.

STH 21 is an OSOW truck route and High Clearance Route. Minimum 20 foot vertical clearance required for new vertical elements such as sign structures, sign bridges, signals and lighting.

Summary Tables:

Descriptions:

Alt.	Traffic Control	Description of Alternative
1	Minor Road Stop Control with Slotted Left turns on Major Road	Maintain two-way stop control, with CTH FF/Reighmoor Road being stop controlled. Install dedicated left turn lanes on STH 21.
2	Roundabout	Install a roundabout at the intersection of STH 21 and CTH FF/Reighmoor Road.

Costs and Impacts:

Alt.	Traffic Control	Construction Cost	Real Estate Impacts			Environmental Impacts	
			# Build	# Acres	Cost	Impact Type	# Acres
1	Minor Road Stop Control with Slotted Left turns on Major Road	$1,620,000	N/A	.07	$2000	Wetland	0
2	Roundabout	$2,200,000	N/A	1.033	$65,900	Wetland	0

Safety Performance:

Alt.	Traffic Control	Analysis Period	KABC	PDO	Total
-	Existing Conditions	2014 -2018	9	2	11
-	Future No-Build	2027-2036	5.806	13.169	18.975
1	Minor Road Stop Control with Slotted Left turns on Major Road	2027-2036	3.019	6.848	9.867
2	Roundabout	2027-2036	2.360	15.651	18.011

Safety performance results are from the Safety Certification Document, dated 8-6-2020, signed 9-14-2020. Analysis method: Interactive Highway Safety Design Model

Recommendation:

Alternative:

Influencing Factors:

Existing & Future No-Build Conditions:

Practical Feasibility:

Public Opinion:	Concerns with safety have been expressed by local officials. A public involvement meeting is scheduled in 2021.
Business Impacts:	None
ROW Impacts:	None
Utility Impacts:	None
Cost Estimate:	$0
Additional Info:	N/A

Safety Analysis:

Crash Trend(s) and Contributing Factors:	Left turning vehicles on STH 21 appear to be a factor in 6 of the 11 crashes. For these crashes, STH 21 through traffic rear ends traffic that is planning to turn left. Currently, left turn lanes do not exist on STH 21. Another factor may be difficulty selecting adequate gaps when crossing or turning left.
Conflict Points:	EB and WB left turns conflicting with opposing through traffic. NB and SB left turns conflicting with EB and WB traffic.
Vulnerable Users:	N/A
Additional Info:	N/A

Safety Performance Measures:

	Analysis Period	KABC	PDO	Total
Existing Conditions	2014 -2018	9	2	11
Future No-Build	2027-2036	5.806	13.169	18.975

Operational Analysis:

Warrant Analysis:	Utilizing traffic counts from January 16, 2020, traffic signal warrants were evaluated for the intersection of STH 21 and CTH FF/Reighmoor Rd. The signal warrant analysis showed that traffic signals were not warranted at the intersection, therefore a traffic signal alternative was eliminated from consideration.
Queue Impacts:	There are driveways located on the north leg of Reighmoor Road starting at approximately 150’ north of the intersection. There is a driveway on the south leg of CTH FF at approximately 145’ south of the intersection. The northbound and southbound queues do not impact these driveways.
Additional Capacity:	None
Railroad Impacts:	None
Additional Info:	In 2047, the northbound leg experiences a LOS of D in the pm peak hour.

Operational Performance Measures:

Year: 2027 — **Existing Conditions**

AM Peak	EB			WB			NB			SB		
	L/T	-	R	L/T	-	R	-	All	-	-	All	-
# Lanes	1		1	1		1		1			1	
LOS	A			A				C			C	
Delay (s)	7.9			8.6				15.6			19.4	
v/c	0.00			0.02				0.17			0.18	
Queue (ft.)	0			2.5				15			15	
Storage (ft.)												

PM Peak	EB			WB			NB			SB		
	L/T	-	R	L/T	-	R	-	All	-	-	All	-
# Lanes	1		1	1		1		1			1	
LOS	A			A				C			C	
Delay (s)	8.7			8.3				21.7			20.0	
v/c	0.02			0.02				0.20			0.10	
Queue (ft.)	0			2.5				17.5			7.5	
Storage (ft.)												

Additional Information

Year: 2047 — **Future No-Build Conditions (Design Year)**

AM Peak	EB			WB			NB			SB		
	L/T	-	R	L/T	-	R	-	All	-	-	All	-
# Lanes	1		1	1		1		1			1	
LOS	A			A				C			C	
Delay (s)	7.9			8.7				19.7			19.6	
v/c	0.01			0.02				0.26			0.22	
Queue (ft.)	0			2.5				25			20	
Storage (ft.)												

PM Peak	EB			WB			NB			SB		
	L/T	-	R	L/T	-	R	-	All	-	-	All	-
# Lanes	1		1	1		1		1			1	
LOS	A			A				D			C	
Delay (s)	8.9			8.4				31.5			21.0	
v/c	0.03			0.02				0.34			0.14	
Queue (ft.)	2.5			2.5				35			12.5	
Storage (ft.)												

Additional Information

Alt. 1: Minor Road Stop Control with Slotted Left turns on Major Road:

Practical Feasibility:

Public Opinion:	A public involvement meeting is scheduled in 2021.
Business Impacts:	None
ROW Impacts:	0.07 Acres, $2000
Utility Impacts:	Unknown
Cost Estimate:	$1,620,000
Additional Info:	None

Safety Analysis:

Crash Trend(s) being Improved with Alt.:	The addition of slotted left turn lanes on STH 21 would address crashes related to left turning vehicles and rear end crashes.
Geometric Concerns:	Due to the addition of left turn lanes, sideroad cross traffic will have additional travel length to cross STH 21 or turn left onto STH 21.
Additional Info:	None

Safety Performance Measures:

	Analysis Period	KABC	PDO	Total
Existing Conditions	2014 -2018	9	2	11
Future No-Build	2027-2036	5.806	13.169	18.975
Alt. 1: Minor Road Stop Control with Slotted Left turns on Major Road:	2027-2036	3.019	6.848	9.867

Operational Analysis:

Warrant Analysis:	N/A
Queue Impacts:	There are driveways located on the north leg of Reighmoor Road starting at approximately 150’ north of the intersection. There is a driveway on the south leg of CTH FF at approximately 145’ south of the intersection. The northbound and southbound queues do not impact these driveways.
Additional Capacity:	None
Railroad Impacts:	None
Additional Info:	In 2047, the northbound leg experiences a LOS of D in the pm peak hour.

Operational Performance Measures:

Year: 2027	Alt. 1: Minor Road Stop Control with Slotted Left turns on Major Road											
AM Peak	EB			WB			NB			SB		
	L	T	R	L	T	R	-	All	-	-	All	-
# Lanes	1	1	1	1	1	1		1			1	
LOS	A			A				C			C	
Delay (s)	7.9			8.6				15.6			19.3	
v/c	0.00			0.02				0.17			0.18	
Queue (ft.)	0			2.5				15			15	
Storage (ft.)	300			300								
PM Peak	EB			WB			NB			SB		
	L	T	R	L	T	R	-	All	-	-	All	-
# Lanes	1	1	1	1	1	1		1			1	
LOS	A			A				C			C	
Delay (s)	8.7			8.3				21.5			19.8	
v/c	0.02			0.02				0.20			0.10	
Queue (ft.)	0			2.5				17.5			7.5	
Storage (ft.)	300			300								
Additional Information												

Year: 2047	Alt. 1: Minor Road Stop Control with Slotted Left turns on Major Road											
AM Peak	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
# Lanes	1	1	1	1	1	1		1			1	
LOS	A			A				C			C	
Delay (s)	7.9			8.7				19.7			19.5	
v/c	0.01			0.02				0.26			0.22	
Queue (ft.)	0			2.5				25			20	
Storage (ft.)	300			300								
PM Peak	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
# Lanes	1	1	1	1	1	1		1			1	
LOS	A			A				D			C	
Delay (s)	8.9			8.4				30.9			20.8	
v/c	0.03			0.02				0.34			0.13	
Queue (ft.)	2.5			2.5				35			12.5	
Storage (ft.)	300			300								
Additional Information												

Alt. 2: Roundabout:

Practical Feasibility:

Public Opinion:	A public involvement meeting is scheduled in 2021.
Business Impacts:	Roundabout is designed to accommodate OSOW vehicles. There are no impacts to businesses.
ROW Impacts:	1.033 Acres, $65,900
Utility Impacts:	Unknown
Cost Estimate:	$2,200,000
Additional Info:	None

Safety Analysis:

Crash Trend(s) being Improved with Alt.:	The installation of a roundabout at the intersection of STH 21 and CTH FF/Reighmoor Road would address right-angle crashes and left turning crashes at the intersection.
Geometric Concerns:	None
Additional Info:	None

Safety Performance Measures:

	Analysis Period	KABC	PDO	Total
Existing Conditions	2014 -2018	9	2	11
Future No-Build	2027-2036	5.806	13.169	18.975
Alt. 2: Roundabout:	2027-2036	2.360	15.651	18.011

Operational Analysis:

Warrant Analysis:	N/A
Queue Impacts:	Queue lengths on STH 21 are less than 100 feet for eastbound and westbound in 2047 AM and PM peak hours.
Additional Capacity:	All legs operate at a LOS of A in 2047 for the AM and PM peak hours. This alternative has additional capacity compared to alternative 1.
Railroad Impacts:	None
Additional Info:	All legs operate at a LOS of A in 2047 for the AM and PM peak hours.

Operational Performance Measures:

Year: 2027	Alt. 2: Roundabout											
AM Peak	EB			WB			NB			SB		
	-	All	-	-	All	-	-	All	-	-	All	-
# Lanes		1			1			1			1	
LOS		A			A			A			A	
Delay (s)		7.2			4.8			5.5			4.2	
v/c		0.44			0.24			0.09			0.06	
Queue (ft.)		69.7			30			8.7			5.4	
Storage (ft.)												
PM Peak	EB			WB			NB			SB		
	-	All	-	-	All	-	-	All	-	-	All	-
# Lanes		1			1			1			1	
LOS		A			A			A			A	
Delay (s)		6.1			7.7			4.7			5.2	
v/c		0.36			0.48			0.06			0.04	
Queue (ft.)		51.5			81.6			6			3.3	
Storage (ft.)												
Additional Information												

Year: 2047	Alt. 2: Roundabout											
AM Peak	EB			WB			NB			SB		
	-	All	-	-	All	-	-	All	-	-	All	-
# Lanes		1			1			1			1	
LOS		A			A			A			A	
Delay (s)		7.8			5.1			6.0			4.5	
v/c		0.479			0.259			0.116			0.076	
Queue (ft.)		82.2			32.8			11.1			7.4	
Storage (ft.)												
PM Peak	EB			WB			NB			SB		
	-	All	-	-	All	-	-	All	-	-	All	-
# Lanes		1			1			1			1	
LOS		A			A			A			A	
Delay (s)		6.6			8.8			5.1			5.7	
v/c		0.397			0.530			0.084			0.051	
Queue (ft.)		60.9			97.0			8.1			4.7	
Storage (ft.)												
Additional Information												

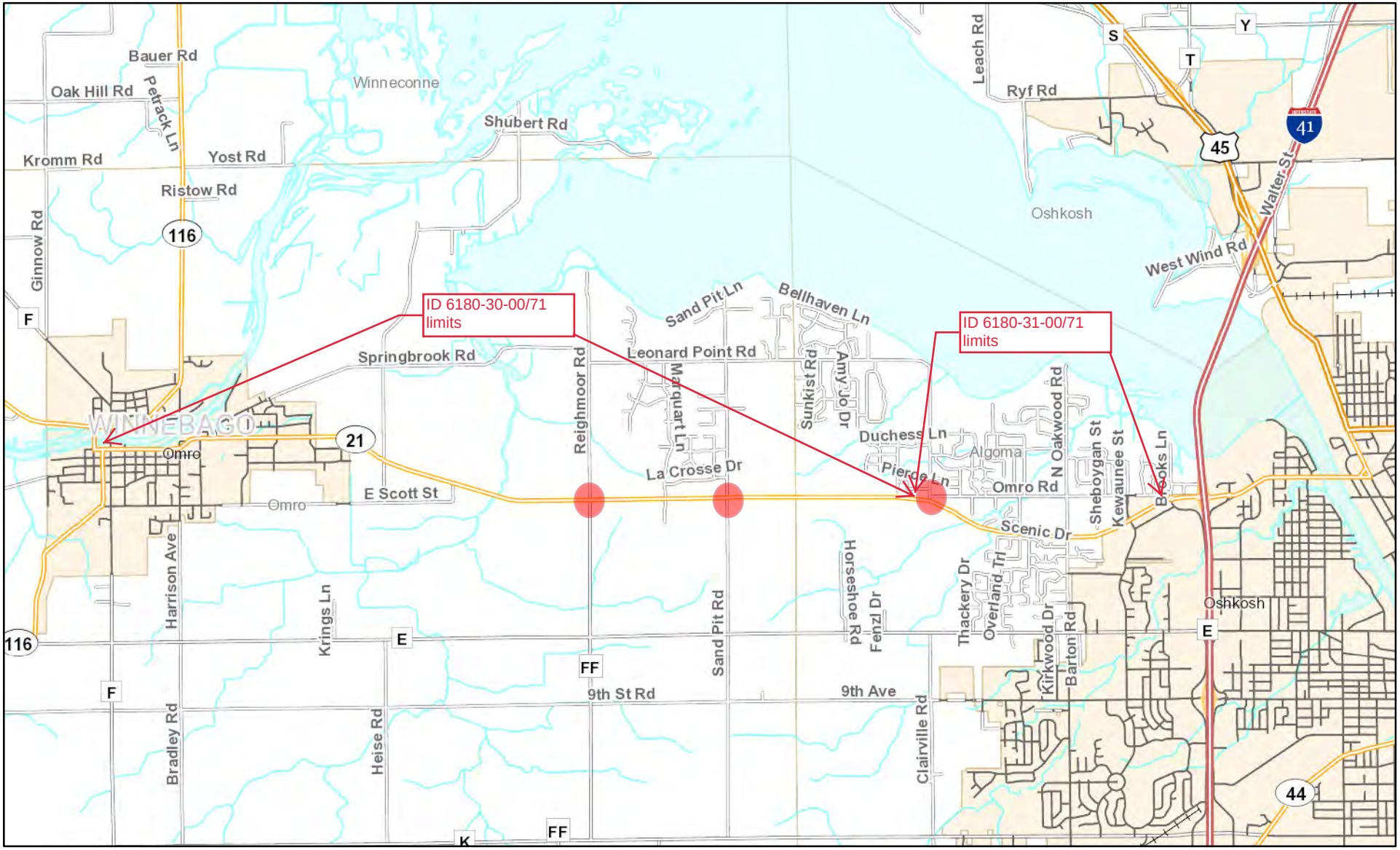
Attachments:

(Provide attachments outline in FDM 11-25-3 Attachment 3.7 as appropriate)

1. Project Location Map
2. Aerial Photo
3. Traffic Data
4. Crash Diagram
5. Exhibits
    a. Existing
    b. Alternative 1 - Left Turn Lane
    c. Alternative 2 - Roundabout
6. Safety Certification Document
7. Signal Warrants
8. Capacity Analysis
    a. HCS
    b. SIDRA 9

January 22, 2020
exported from dotview
WisDOT

DOTView Map



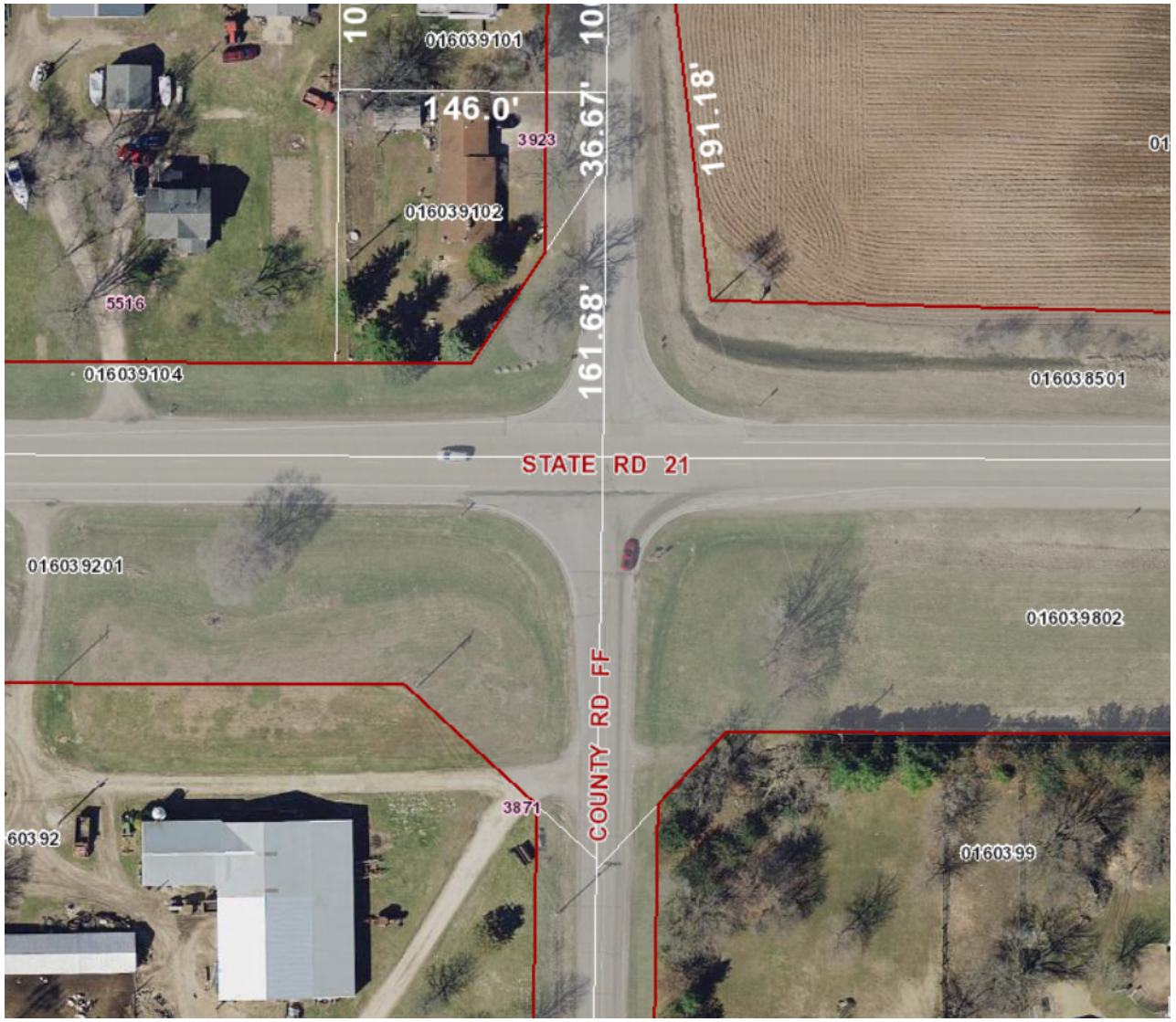
- Railroads
- Interstate Highways
- US Highways
- State Highways
- Off-Mainline Routes
- Urban Streets
- County Trunks
- Rural Roads
- Potential Intersection Improvement

Project 6180-30-00/71
Omro - Oshkosh
WIS 116 - Leonard Point Rd
WIS 21
Winnebago County

Project 6180-31-00/71
Omro - Oshkosh
Leonard Point Rd - Washburn St
WIS 21
Winnebago County

6180-30-00
STH 21
STH 116 - Leonard Point Rd
Winnebago County

Intersection STH 21 & County Rd FF/Reighmoor Rd



Traffic Forecasting Section; Bureau of Planning and Economic Development; Division of Transportation Investment Management

WisDOT TRAFFIC FORECAST REPORT

PROJECT ID(S):	6180-30-00
ROUTE(S):	STH 21
Region/COUNTY(IES):	NE/Winnebago
LOCATION:	STH 116 - Leonard Point Rd
COMPLETED:	10/26/2020

Developed By Thor Jeppson
Phone: (608) 266-2328
E-Mail: Thor.Jeppson@dot.wi.gov

NOTES ON THE FORECAST:

1. This projection assumes that no major new traffic generators will be added to the development already included in the 2010/2045 Northeast Regional Travel Demand Model.

2. Vehicle classification data and design values (K factors, directional splits, and percent trucks in design hours) are available here: http://wisconsindot.gov/Pages/projects/data-plan/traf-fore/default.aspx

3. West of Leonard Point Rd., STH 21 is a Factor Group IV (Rural-Other) roadway (indicating low to moderate fluctuation in traffic from a seasonal perspective). It is functionally classified as a Rural Principle Arterial (2) for count purposes. East of Leonard Point Rd., STH 21 is a Factor Group II (Urban-Other) roadway (indicating low to moderate fluctuation in traffic from a seasonal perspective). It is functionally classified as an Urban Principal Arterial (14) for count purposes.

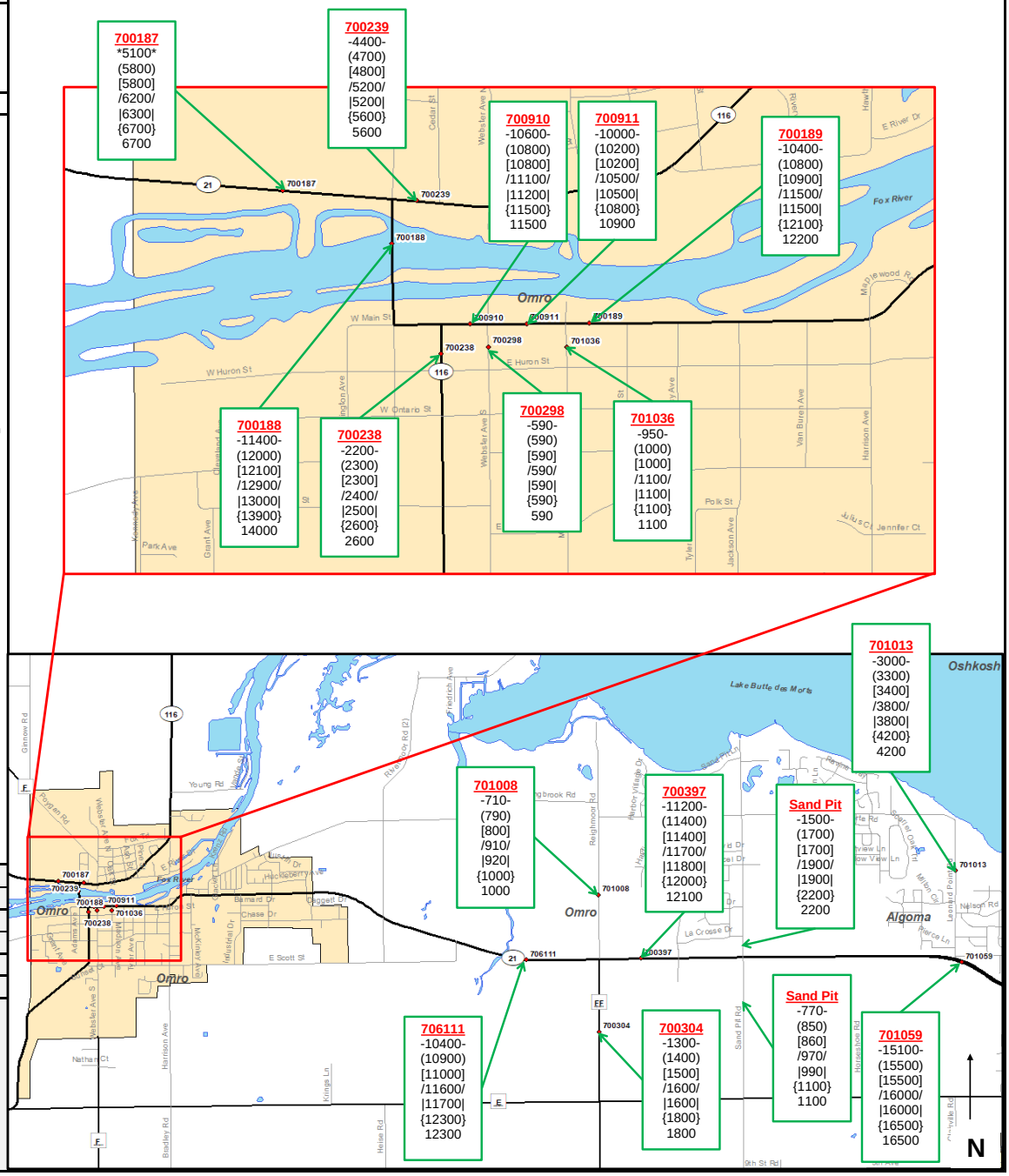
4. The 2010/2045 Northeast Regional Travel Demand Model was used to complete this forecast. The Traffic Analysis Forecasting Information System output was used as a comparison tool to check against the model output. Adjustments were made as needed.

5. Roadway improvements coded within the existing plus committed (E+C) network of the 2010/2045 Northeast Regional Travel Demand Model were assumed to be in place for the purposes of developing this forecast.

Site(s)	**701059**		
Routes(s)	**STH 21**		
Volume(s)	16530		
Site Growth %	0.33%		

SITE ID = Colored, **bolded**, and underlined

Symbol	Count	Symbol	Forecast
-000-	2019 Count	(000)	2026 AADT
000	2012 Count	[000]	2027 AADT
		/000/	2036 AADT
		|000|	2037 AADT
		{000}	2046 AADT
		000	2047 AADT



WisDOT Bureau of Planning & Economic Development
Traffic Forecasting Section
Forecast by: Thor Jeppson
Phone: (608) 266-2328
Email: Thor.Jeppson@dot.wi.gov

Projected AM Design Hour Traffic Volumes

Indicates roundabout

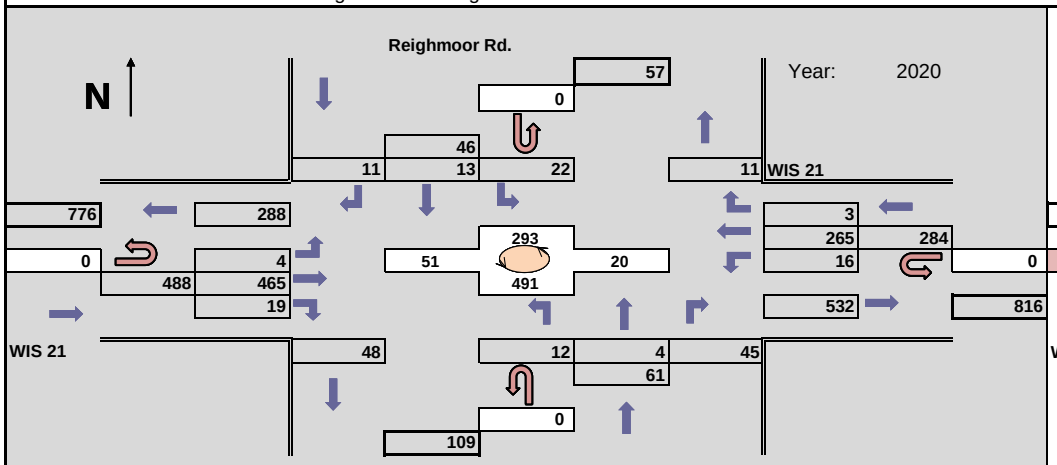
Design Hour: 7:00-8:00am

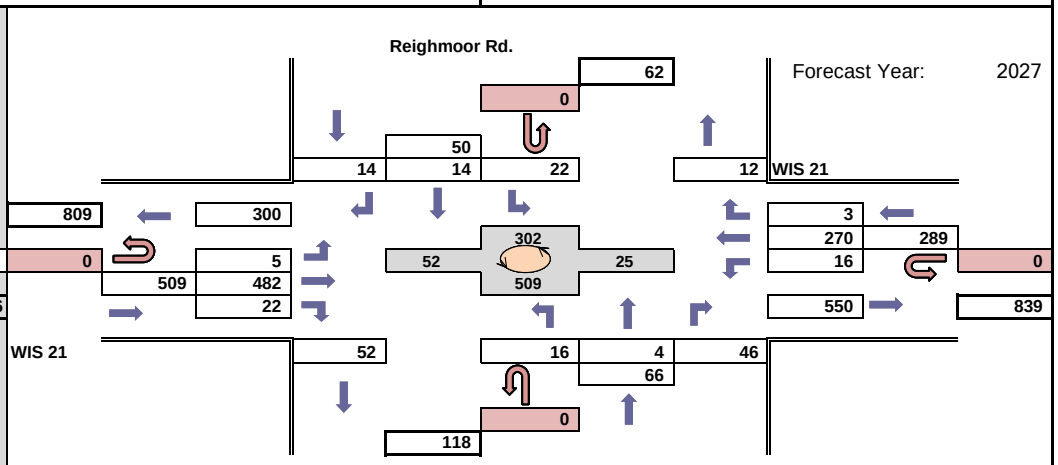
Forecast Completed: 10/26/2020

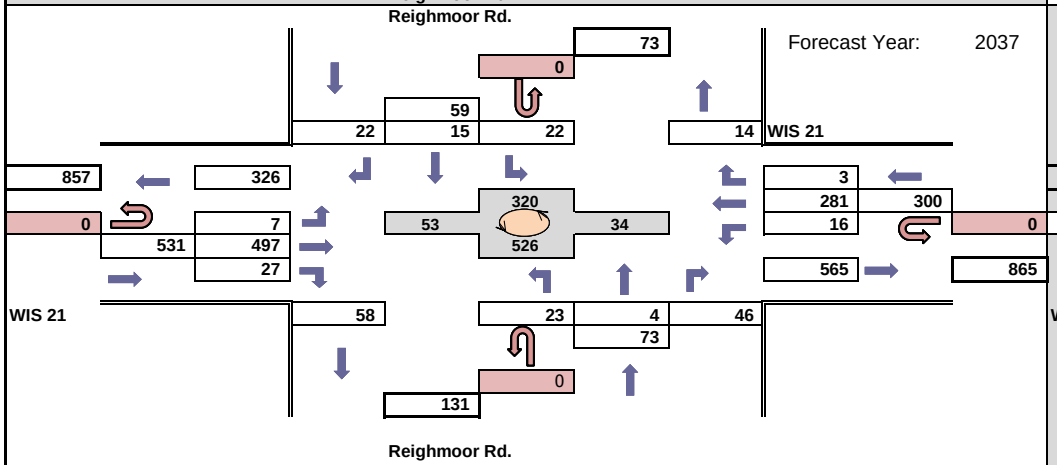
Design Hour Turning Movement Data

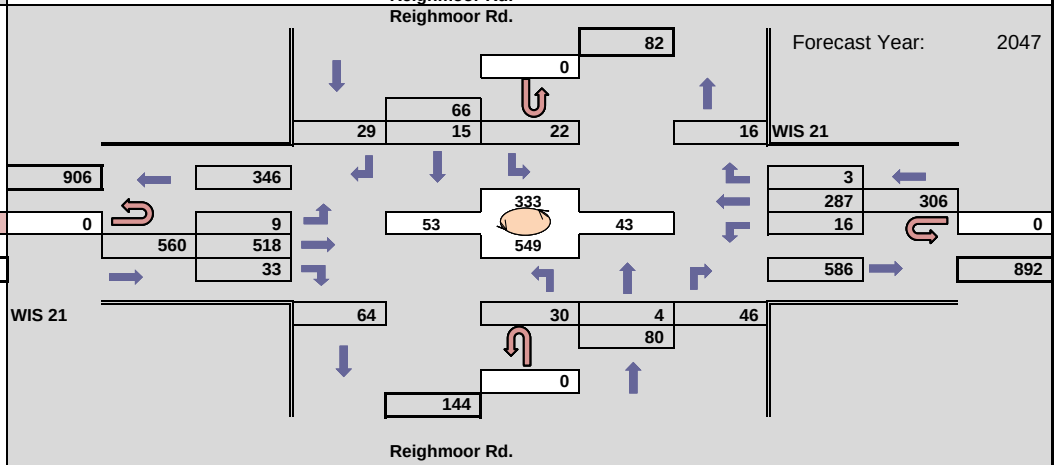
Project Description

Project ID(s): 6180-30-00
Route(s): STH 21
Region/COUNTY(IES): NE/Winnebago
Location: @Reighmoor Rd/CTH FF









WisDOT Bureau of Planning & Economic Development
Traffic Forecasting Section
Forecast by: Thor Jeppson
Phone: (608) 266-2328
Email: Thor.Jeppson@dot.wi.gov

Projected PM Design Hour Traffic Volumes

Indicates roundabout

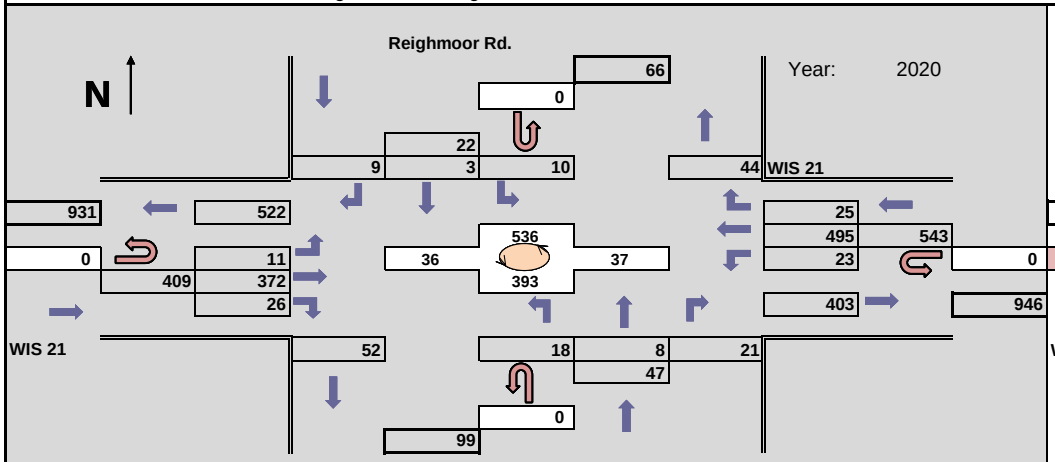
Design Hour: 3:30-4:30pm

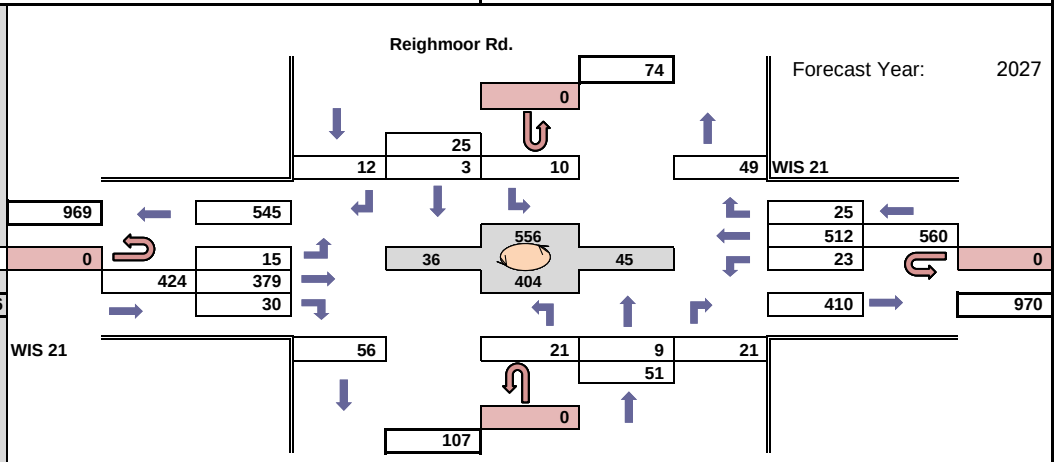
Forecast Completed: 10/26/2020

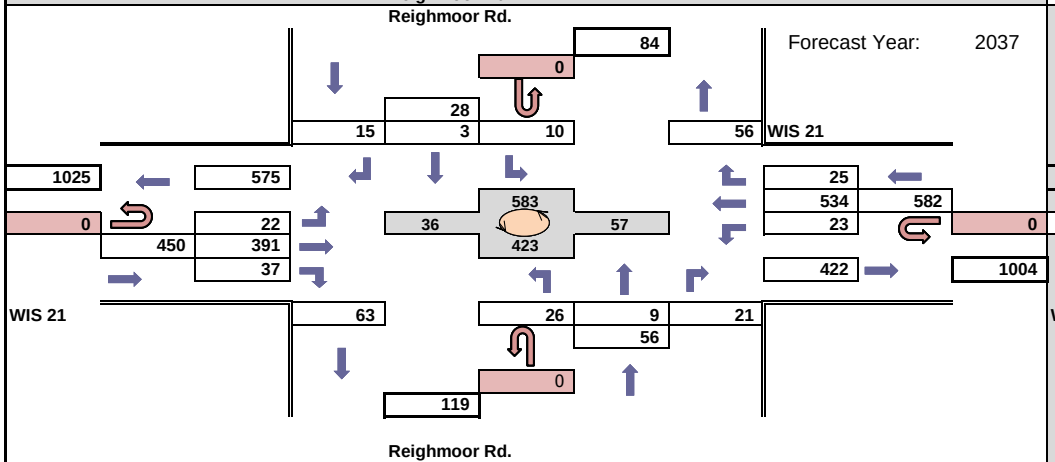
Design Hour Turning Movement Data

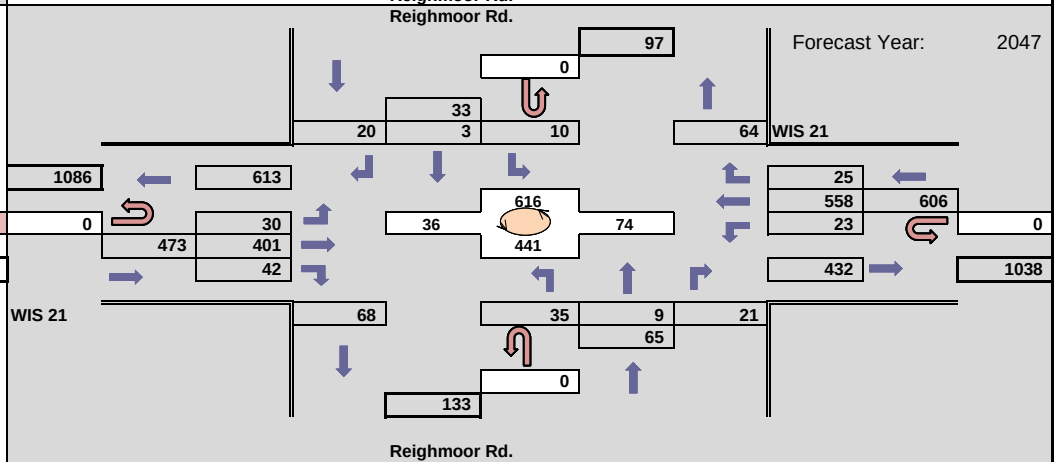
Project Description

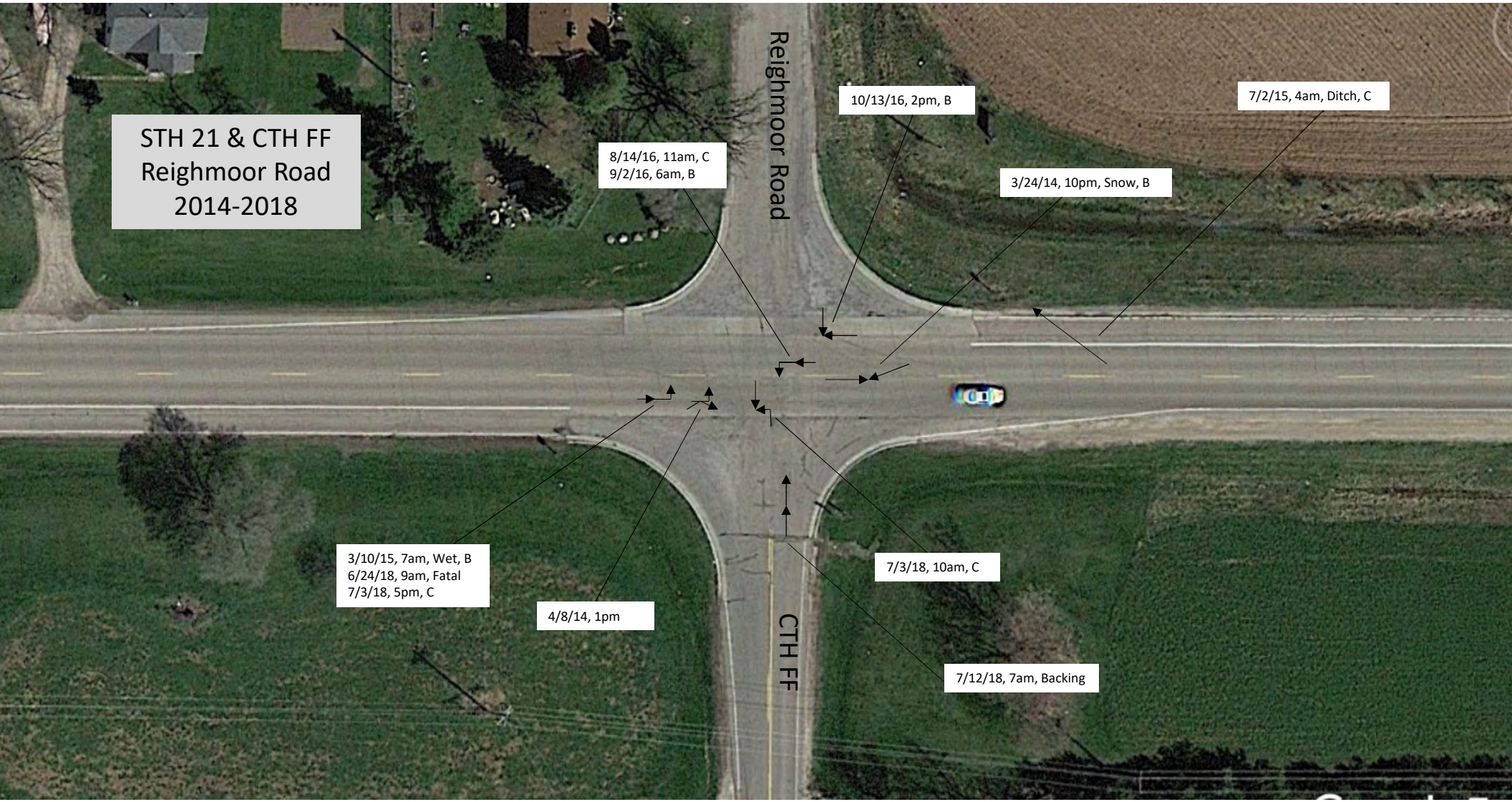
Project ID(s): 6180-30-00
Route(s): STH 21
Region/COUNTY(IES): NE/Winnebago
Location: @Reighmoor Rd/CTH FF










STH 21 & CTH FF
Reighmoor Road
2014-2018
Reighmoor Road
CTH FF
10/13/16, 2pm, B
7/2/15, 4am, Ditch, C
8/14/16, 11am, C
9/2/16, 6am, B
3/24/14, 10pm, Snow, B
3/10/15, 7am, Wet, B
6/24/18, 9am, Fatal
7/3/18, 5pm, C
4/8/14, 1pm
7/3/18, 10am, C
7/12/18, 7am, Backing

2

2

PROJECT NO: 6180-30-71	HWY: STH 21	COUNTY: WINNEBAGO	STH 21 & CTH FF - EXISTING CONDITIONS	SHEET	E

FILE NAME : N:\3001091.00\REPORTS\ICE\DRAWINGS\ICE-61803000-STH 21.DWG
LAYOUT NAME - 1 - ICE-618030-STH 21 EXISTING-CTH FF

PLOT DATE : 2/24/2021 3:36 PM PLOT BY : CRAIG KNUTH PLOT NAME : PLOT SCALE : 1 IN:200 FT

WISDOT/CADDS SHEET 42

2

2

Project ID 6180-30-00
State 21 and County FF
Intersection
STH 21
Winnebago County

CTH FF

STH 21

STH 21

CTH FF

N

SCALE, FEET 0 100 200

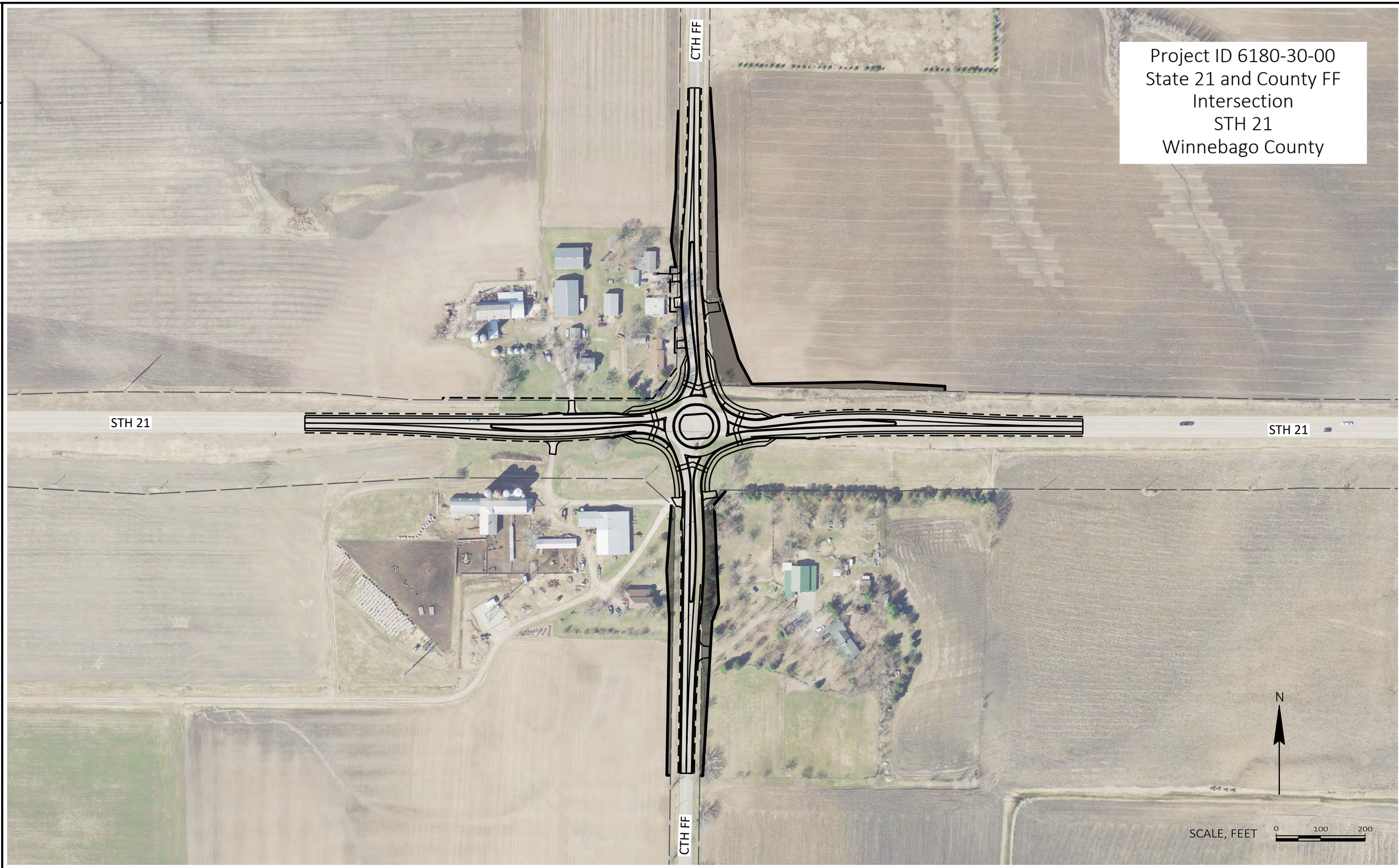
PROJECT NO: 6180-30-71	HWY: STH 21	COUNTY: WINNEBAGO	STH 21 & CTH FF - LEFT-TURN LANES OPTION	SHEET	E

FILE NAME : N:\3001091.00\REPORTS\ICE\DRAWINGS\ICE-61803000-STH 21.DWG
LAYOUT NAME - 5 - ICE-618030-STH 21 LEFT -CTH FF

PLOT DATE : 2/24/2021 3:36 PM PLOT BY : CRAIG KNUTH PLOT NAME : PLOT SCALE : 1 IN:200 FT

WISDOT/CADDS SHEET 42

2



Project ID 6180-30-00
State 21 and County FF
Intersection
STH 21
Winnebago County

2

PROJECT NO: 6180-30-71	HWY: STH 21	COUNTY: WINNEBAGO	STH 21 & CTH FF - ROUNDABOUT OPTION	SHEET	E

FILE NAME : N:\3001091.00\REPORTS\ICE\DRAWINGS\ICE-61803000-STH 21.DWG
LAYOUT NAME - 3 - ICE-618030-STH 21 RA-CTH FF

PLOT DATE : 2/24/2021 3:36 PM PLOT BY : CRAIG KNUTH PLOT NAME : PLOT SCALE : 1 IN:200 FT

WISDOT/CADDS SHEET 42

CORRESPONDENCE/MEMORANDUM **State of Wisconsin**

Date: August 6, 2020

To: WisDOT NE Region Planning Chief: Brian Brock
Bureau of Traffic Operations – Traffic Engineering and Safety Section (BTOSafetyEngineering@dot.wi.gov)

From: Scott Nelson
WisDOT NE Region

Subject: SAFETY CERTIFICATION DOCUMENT
Project I.D. (design) 6180-30-00
STH 21 from STH 116 – Leonard Point Road
Winnebago County

Having considered the safety performance of the existing corridor and any proposed improvements, we believe this document reflects the intent of the policy and guidelines described in section 11-38 of the Wisconsin Facilities Development Manual.

Concurrence:

Kevin M. Scopoline — 8/26/2020

Bureau of Traffic Operations — Date
Traffic Engineering and Safety Section

Approval:

Brian S. Brock — 9/14/2020

Region Planning Chief — Date

SAFETY CERTIFICATION DOCUMENT

Analyst:	Scott A. Nelson	**Design ID:**	6180-30-00
Agency:	WisDOT DTSD NE Region	**Highway:**	STH 21
Date:	August 6, 2020	**Project Title:**	Omro – Oshkosh, STH 116 – Leonard Pt Rd
		Improvement Concept Code:	RSRF10

1. **Did the project have Sites of Promise from the system screening?** Yes ☒ No ☐

   Comments:

   PDP ID 4284 – STH 116 to Webster - Crash Rate Flag 2.11, KAB Crash Rate Flag 2.09
   PDP ID 4289 – CTH FF to Sand Pit Road - KAB Crash Rate Flag 1.46
   PDP ID 4290 – Sand Pit Road to Leonard Point Road - Crash Rate Flag 1.18, KAB Crash Rate Flag 1.79
   IX_70_02975 – STH 21 & STH 116 - Total Crash LOSS 4, PSI 3.97, KABC LOSS 4, PSI 0.84
   IX_70_02977 – STH 21 & Madison Ave - Total Crash LOSS 4, PSI 2.39
   IX_70_02978 – STH 21 & Monroe St - KABC LOSS 4, PSI 0.45
   IX_70_02980 – STH 21 & Quincy - KABC LOSS 4, PSI 1.16
   IX_70_03026 – STH 21 & McKinley Ave - KABC LOSS 4, PSI 0.45
   IX_70_03024 – STH 21 Beckwith Ave - KABC LOSS 4, PSI 0.45
   IX_70_03034 – STH 21 & Alder Ave & Goldenrod Dr - Total Crash LOSS 4, PSI 4.27, KABC LOSS 4, PSI 1.43
   IX_70_02902 – STH 21 & Rivermoor Rd - Total Crash LOSS 4, PSI 2.84
   IX_70_02649 – STH 21 & CTH FF/Reighmoor Rd - Total Crash LOSS 4, PSI 3.21, KABC LOSS 4, PSI 3.76
   IX_70_02660 – STH 21 & Sand Pit Rd - Total Crash LOSS 4, PSI 9.04, KABC LOSS 4, PSI 4.10

2. **Did relevant crashes remain after the initial Crash Vetting Process?** Yes ☒ No ☐

   Comments:
   PDP ID 4284 – STH 116 to Webster (Segment Identified) – Of the ten crashes in this segment, five crashes remained after vetting. Four WB rear end crashes at the Jefferson St intersection and one at a driveway. A TWLTL was evaluated for feasibility by PDS preliminary engineering and it was determined to not be a feasible alternative.

   PDP ID 4289 – CTH FF to Sand Pit Road (Segment Identified) – Of the twenty-two crashes in this segment, twelve crashes remain after vetting. Only one segment crash occurred near Potratz Hill, but no safety mitigation strategies are recommended base on this one isolated crash. The remaining crashes will be addressed in the intersection safety flag for the CTH FF/Reighmoor intersection.

   PDP ID 4290 – Sand Pit Road to Leonard Point Road (Segment Identified) – Of the thirty-seven crashes in this segment, fourteen remaining after vetting. Nine of these crashes occurred at the Sand Pit Road intersection and will be addressed in the intersection safety flag below. The remaining five crashes involve drifting left of center along this segment. The improvement project will include centerline rumble stripes which should help address this crash trend.

   IX_70_02975 – STH 21 & STH 116 (Intersection Identified) – Of the eight crashes at this intersection, five remain after vetting. Four WB rear end crashes at the Jefferson St intersection and one at a driveway. A TWLTL was evaluated for feasibility by PDS preliminary engineering and it was determined to not be a feasible alternative.

   IX_70_02977 – STH 21 & Madison Ave (Intersection Identified) – One of the seven crashes remain after vetting. The crash involved a WB vehicle yielded to a pedestrian crossing North to South on the East side of the intersection. Another WB tried bypassing WB on right and struck the pedestrian. The crash could be classified as driver error by bypassing the yielding vehicle in front. No safety mitigation strategies are recommended based on this one crash.

   IX_70_02978 – STH 21 & Monroe St (Intersection Identified) - Of the four crashes at this intersection three remained after vetting. Two WB rear ends of left turns onto Monroe and one WB rear end turning into Kwik Trip. A TWLTL was evaluated for feasibility by PDS preliminary engineering and it was determined to not be a feasible alternative. No other safety mitigation strategies are recommended.

IX_70_02980 – STH 21 & Quincy (Intersection Identified) – Of the three crashes at this intersection, one remained after vetting and it occurred at a driveway near the Quincy St. intersection. A WB rear end of left turning traffic into a driveway near Quincy Ave. No safety mitigation strategies are recommended based on this one crash.

IX_70_03026 – STH 21 & McKinley Ave (Intersection Identified) – Of the four crashes at this intersection, three remain after vetting. Three WB rear end crashes have occurred with left turns onto McKinley Ave. A TWLTL was evaluated for feasibility by PDS preliminary engineering and it was determined to not be a feasible alternative. No other safety mitigation strategies are recommended.

IX_70_03024 – STH 21 Beckwith Ave (Intersection Identified) – Of the four crashes at this intersection, no crashes remain after vetting. No safety mitigation strategies are recommended.

IX_70_03034 – STH 21 & Alder Ave & Goldenrod Dr (Intersection Identified) – Of the ten crashes at this intersection, three remained after vetting. Two EB rear end crashes while turning onto Goldenrod and on WB rear end crash while turning onto Alder Ave. A TWLTL was evaluated for feasibility by PDS preliminary engineering and it was determined to not be a feasible alternative. No other safety mitigation strategies are recommended.

IX_70_02902 – STH 21 & Rivermoor Rd (Intersection Identified) - Of the four crashes at this intersection, no crashes remain after vetting. No safety mitigation strategies are recommended.

IX_70_02649 – STH 21 & CTH FF/Reighmoor Rd (Intersection Identified) – Of the eleven crashes at this intersection, nine crashes remain after vetting. Six of the nine crashes involved left turning crashes from Hwy 21. One NB left failed to yield to a SB motorist. One SB failed to yield to WB. The remaining crash was not intersection related but the driver drifted off the roadway to the right. Two safety mitigation strategies are recommended to move forward with the CGA process. The first alternative is to add install positive offset left turn lanes on STH 21. The second alternative is to install a roundabout at the intersection.

IX_70_02660 – STH 21 & Sand Pit Rd (Intersection Identified) – Of the eleven crashes at this intersection, eleven crashes remain after vetting. Ten of the eleven crashes involve a left turning vehicle from Highway 21. The specific crash types with the left turns are identified on the collision diagram in Appendix A. The remaining crash was a NB failure to yield to an EB. Two safety mitigation strategies are recommended to move forward with the CGA process. The first alternative is to add install positive offset left turn lanes on STH 21. The second alternative is to install a roundabout at the intersection.

3. **Were possible safety mitigation alternatives identified in the CGA Process?** Yes ☒ No ☐

Comments:

IX_70_02649 – STH 21 & CTH FF/Reighmoor Rd - Two safety mitigation strategies are recommended to move forward with the CGA process. The first alternative is to add install positive offset left turn lanes on STH 21. The second alternative is to install a roundabout at the intersection. Each alternative will target the six mainline left turn crashes that have occurred. Additionally, the two right-angle crashes can be targeted by the roundabout alternative.

IX_70_02660 – STH 21 & Sand Pit Rd - Two safety mitigation strategies are recommended to move forward with the CGA process. The first alternative is to add install positive offset left turn lanes on STH 21. The second alternative is to install a roundabout at the intersection. Each alternative will target the ten mainline left turning crashes that have occurred. Additionally, the right-angle crash will be targeted by the roundabout alternative.

4. **Were safety mitigation alternatives analyzed in this project?** Yes ☒ No ☐

4.1. **Provide narrative of existing geometric conditions and describe any geometric features that contributed to the type or severity of the crashes.**

IX_70_02649 – STH 21 & CTH FF/Reighmoor Rd – The current lane configuration at this intersection consists of a right turn lane and a shared through/left turn lane on STH 21. The absence of the left turn lane has contributed to one fatal crash, two suspect minor injury crashes, two possible injury crashes, and one property damage only crash. Based on mainline and sideroad volumes, picking an adequate gap is also challenging on the sideroad which has contributed to some of the other crashes. The remaining crashes resulted in two suspected minor

injuries, and one possible injury crash.

IX_70_02660 – STH 21 & Sand Pit Rd - The current lane configuration at this intersection consists of a right turn lane and a shared through/left turn lane on STH 21. The absence of the left turn lane has contributed to five suspected minor injuries, three possible injuries, and two property damage only crashes. The remaining right-angle crash resulted in property damage only.

4.2. **Provide narrative of crash history, crash trends, and contributing factors that were targeted in the safety mitigation alternatives.**

IX_70_02649 – STH 21 & CTH FF/Reighmoor Rd – Of the eleven crashes at this intersection, nine crashes remain after vetting. Six of the nine crashes involved left turning crashes from Hwy 21. One NB left failed to yield to a SB motorist. One SB failed to yield to WB. The remaining crash was not intersection related but the driver drifted off the roadway to the right. The current lane configuration at this intersection consists of a right turn lane and a shared through/left turn lane on STH 21. The absence of the left turn lane has contributed to one fatal crash, two suspect minor injury crashes, two possible injury crashes, and one property damage only crash. The remaining crashes resulted in two suspected minor injuries and one property damage only crash. The left turn lane alternative will target the left turn crashes. The roundabout alternative will target the left turn crashes and right-angle crashes.

IX_70_02660 – STH 21 & Sand Pit Rd - Of the eleven crashes at this intersection, eleven crashes remain after vetting. Ten of the eleven crashes involve a left turning vehicle from Highway 21. One NB motorist failed to yield to a EB motorist. The current lane configuration at this intersection consists of a right turn lane and a shared through/left turn lane on STH 21. The absence of the left turn lane has contributed to five suspected minor injuries, three possible injuries, and two property damage only crashes. The remaining right-angle crash resulted in property damage only. The left turn lane alternative will target the left turn crashes. The roundabout alternative will target the left turn crashes and right-angle crashes.

4.3. **Provide narrative and the name for each safety mitigation alternative analyzed in SMCP**

STH 21 & CTH FF/Reighmoor Rd

Concrete Repair & Overlay – Base case with no geometric improvements.

STH 21 Left Turn Lanes – Add EB and WB left turn lanes on STH 21. Final geometry for EB and WB approaches will consist of a left turn lane, a through lane, and a right turn lane.

Single lane roundabout – Construct a single lane roundabout at the CTH FF/Reighmoor Rd intersection.

STH 21 & Sand Pit Road

Concrete Repair & Overlay – Base case with no geometric improvements.

STH 21 Left Turn Lanes - Add EB and WB left turn lanes on STH 21. Final geometry for EB and WB approaches will consist of a left turn lane, a through lane, and a right turn lane.

Single lane roundabout - Construct a single lane roundabout at the Sand Pit Rd intersection.

4.4. **Analysis Results**

Analysis Location: STH 21 & CTH FF/Reighmoor Rd
Analysis Method: 2a

	Base	Alt. A	Alt. B	Add/Remove columns
Alternative Name	Concrete Repair & Overlay	STH 21 Left Turn Lanes	Roundabout	
Fatal & Injury	5.806	3.019	2.360	
Property Damage	13.169	6.848	15.651	
Total	18.975	9.867	18.011	
Benefits	-	$1,653,033.89	$2,744,853.97	
Net Cost	$0	$660,000	$780,000	
B/C		**2.5046**	**3.5190**	

Comments:
Both the left turn lane and roundabout alternative have B/C greater than 1.0 using IHSDM with Wisconsin calibration, crash distribution, model, and economic analysis model data sets. No external CMF's were applied.

Analysis Location: STH 21 & Sand Pit Road
Analysis Method: 2a

	Base	Alt. A	Alt. B	Add/Remove columns
Alternative Name	Concrete Repair & Overlay	STH 21 Left Turn Lanes	Roundabout	
Fatal & Injury	4.918	2.557	2.965	
Property Damage	11.153	5.800	18.645	
Total	16.071	8.357	21.610	
Benefits	-	$1,400,196.68	$2,108,056.68	
Net Cost	$0	$550,000	$730,000	
B/C		**2.5458**	**2.8878**	

Comments:
Both the left turn lane and roundabout alternative have B/C greater than 1.0 using IHSDM with Wisconsin calibration, crash distribution, model, and economic analysis model data sets. No external CMF's were applied.

4.5. **Provide narrative of reasonable and acceptable safety mitigation alternatives for consideration in the project improvement process**

STH 21 & CTH FF/Reighmoor Rd

Alt. A - STH 21 Left Turn Lanes – The addition of left turn lanes on STH 21 approaching CTH FF/Reighmoor Road should be considered as a feasible alternative for consideration through the NEPA process.

Alt. B - Single lane roundabout – A single lane roundabout at the intersection of STH 21 & CTH FF/Reighmoor Rd should be considered as a feasible alternative for consideration through the NEPA process.

STH 21 & Sand Pit Road

Alt. A - STH 21 Left Turn Lanes - The addition of left turn lanes on STH 21 approaching Sand Pit Road should be considered as a feasible alternative for consideration through the NEPA process.

Alt. B - Single Lane Roundabout - A single lane roundabout at the intersection of STH 21 & Sand Pit Rd should be considered as a feasible alternative for consideration through the NEPA process.

ATTACHMENTS

Include all attachments in the final SCD and submit as a PDF

A. Project Information
    a. Project Location/Overview Map
    b. Crash Diagram(s)
B. Sites of Promise Documentation
    a. Meta-Manager spreadsheet
    b. Intersection Network Screening spreadsheet
C. Crash Vetting Documentation
    a. WisTransPortal crash data spreadsheet with vetting comments
D. Contributing Geometric Analysis Documentation
    a. Safety Certification Worksheet
E. Safety Mitigation Certification Documentation
    a. Layout/Schematic for each alternative
    b. Cost estimate for each alternative
    c. IHSDM Crash Prediction Evaluation Report for each alternative
    d. IHSDM Economic Analysis Report
    e. Highway Safety Benefit Cost Analysis Tool results

ATTACHMENT A

Project Information

Project Location/Overview Map

Safety Certification Mapping (SCM) Tool

Design ID
6180-30-00

Construction ID(s)

Project Title
OMRO - OSHKOSH

Project Description
STH 116 - LEONARD POINT ROAD

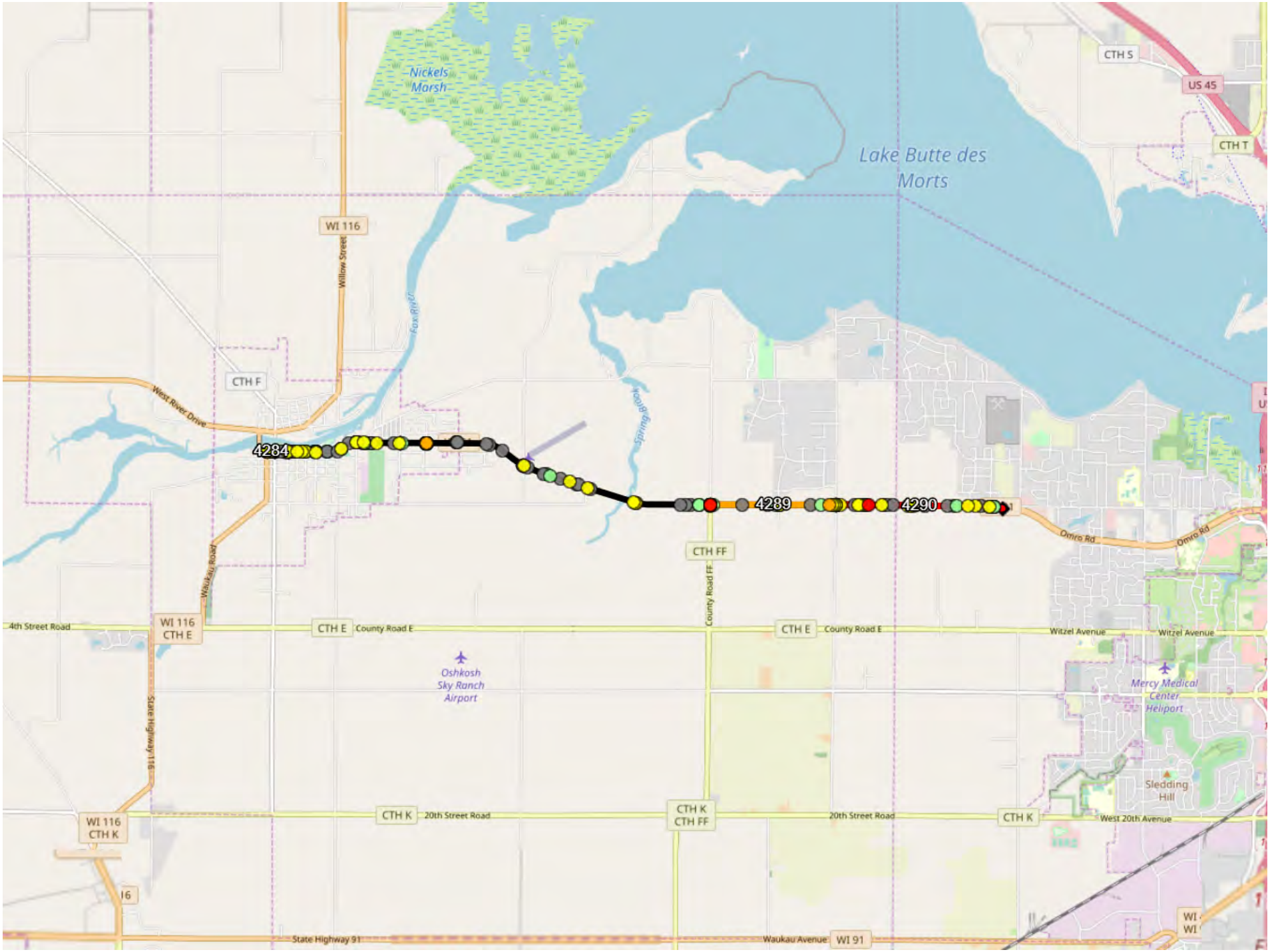
SCM Comment

Meta Manager Version: 2019-10
Meta Manager Crash Years: 2014-2018
SCM Crash Years: 2014-2018

Sites of Promise

Corridor #	Highway	Start County	End County	Start RP	End RP
1	WIS 21 EB	WINNEBAGO	WINNEBAGO	021E162T000	021E170K000

4284: KAB, Crash Rate
4289: KAB
4290: KAB, Crash Rate


Nickels Marsh
Lake Butte des Morts
CTH S
US 45
CTH T
WI 116
Willow Street
Fox River
Spring Brook
CTH F
West River Drive
4284
4289
4290
CTH FF
County Road FF
Omro Rd
Waukau Road
4th Street Road
WI 116
CTH E
CTH E County Road E
CTH E County Road E
Witzel Avenue
Witzel Avenue
Oshkosh Sky Ranch Airport
Mercy Medical Center Heliport
Sledding Hill
State Highway 116
WI 116
CTH K
CTH K 20th Street Road
CTH K
CTH FF
20th Street Road
CTH K
West 20th Avenue
State Highway 91
Waukau Avenue
WI 91

Corridor # 1: WIS 21 EB - 021E162T000 - 021E170K000

Meta Manager Version: 2019-10 Crash Years: 2014-2018					SCM Crash Years: 2014-2018					
PDP ID	Crash	KAB	Int Crash	Int KAB	K	A	B	C	O	TOTAL
4284	2.1088	2.0873					2	1	7	10
4285									5	5
4286							9	5	22	36
4287						1	3	2	12	18
4288							6	3	13	22
4289		1.4584			1	1	7	7	6	22
4290	1.1763	1.7913			1		13	6	17	37
TOTAL					2	2	40	24	82	

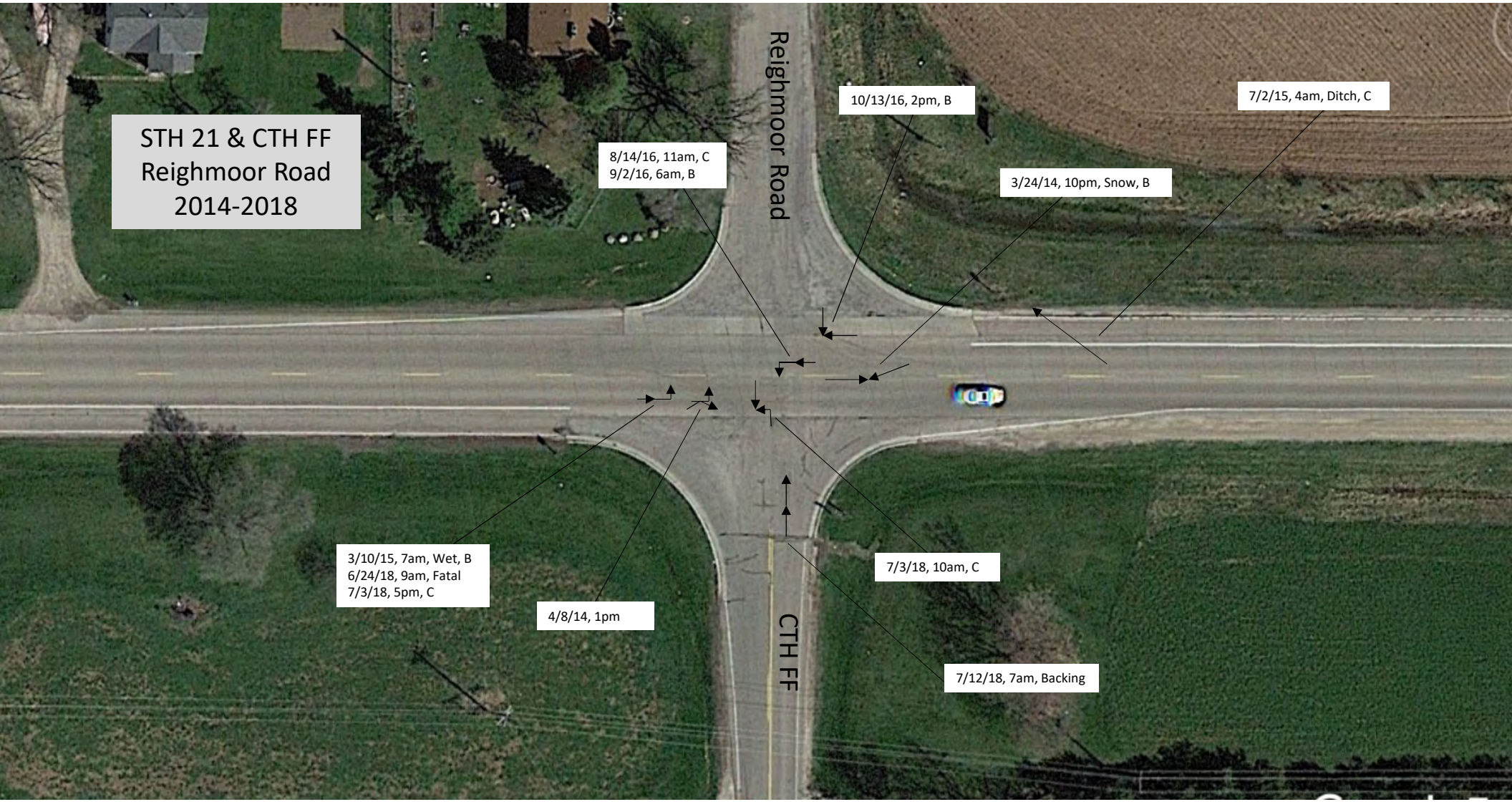
Manner of Collision

PDP ID	NO COLLISION	REAR END	SS OPP	SS SAME	OTHER	TOTAL
4284		9			1	10
4285	1	2		1	1	5
4286	9	20	1		6	36
4287	3	7	1		7	18
4288	12	7		1	2	22
4289	8	8			6	22
4290	10	17	2	1	7	37

ATTACHMENT A

Project Information

Crash Diagram(s)


STH 21 & CTH FF
Reighmoor Road
2014-2018
Reighmoor Road
CTH FF
10/13/16, 2pm, B
7/2/15, 4am, Ditch, C
8/14/16, 11am, C
9/2/16, 6am, B
3/24/14, 10pm, Snow, B
3/10/15, 7am, Wet, B
6/24/18, 9am, Fatal
7/3/18, 5pm, C
4/8/14, 1pm
7/3/18, 10am, C
7/12/18, 7am, Backing


STH 21 & Sand Pit Road
2015- 2019
6/14/15, 5pm
11/23/15, 5pm
5/2/16, 7am, B
5/31/16, 11am, C
8/25/17, 10am, B
10/31/19, 10AM, Wet
12/18/17, 5pm, B
5/25/19, 4pm, C
5/28/19, 3pm, B
10/3/19, 4pm, C
12/19/15, 9am, C
4/27/15, 6pm, C
21
Sand Pit Road
Sand Pit Rd

ATTACHMENT B

Sites of **Promise Documentation**

Meta-Manager Spreadsheet

PDP_ID	ISEQNO	TRAF_SEG_ID	RECKEY	FOS_PROJ_ID	PDP_FRM	PDP_TO	PDP_MILE	ACSI_INTS_NM	DIVUND	HWY&DIR	PPROJ_GRP_DESC	RATE	RATEFLAG	CRASHES	CRASHYR5	CRASHYR4	CRASHYR3	CRASHYR2	CRASHYR1	CPM	AKNO	AKPROP	AKFLAG	RORPROP	RORFLAG	INTPROP	INTFLAG	CRSHSPOT	SEVINDX	SIREDUC	LOP	IMPFLAG	SFTY_TRVL_CLS_CD	HSTL_AADT_5_YR	MMGR_WTHR_CRSH_TOT	MMGR_FATAL_CRSH_TOT	MMGR_INCAP_INJ_CRSH_TOT	MMGR_NONINCAP_INJ_CRSH_TOT	MMGR_PSBL_INJ_CRSH_TOT	MMGR_PD_ONLY_CRSH_TOT	MMGR_BIKE_CRSH_TOT	MMGR_PED_CRSH_TOT	WI_CNTY_NM	YRS_OTT	MMGR_HMVMT	MMGR_FATL_INJY_OCCP_TOT	MMGR_INCAP_INJY_OCCP_TOT	MMGR_NONINCAP_INJY_OCCP_TOT	MMGR_PSBL_INJY_OCCP_TOT	MMGR_KAB_INJY_RT	MMGR_KAB_INJY_RT_FL	MMGR_KAB_CRSH_RT	MMGR_KAB_CRSH_RT_FL	MMGR_DRV_FL	UCL_CRSH_RT	UCL_KAB_INJY_RT	UCL_KAB_CRSH_RT	ECON_RCD_OVER_RSRF
4311	24840	6417	100988	61803071	021E162T000	021E162T006	0.06	STH 116 WB	U	021E	STH 116 - LEONARDS POINT ROAD	992.654	2.10	2.0	2	2	2	2	2	33.3	0.0	0.0%	0.00	0.0%	0.00	70.0%	1.01	1	15	9	18	YES	440	9200	3	0	0	2	1	7	0	0	WINNEBAGO	5	0.0101	0	0	2	1	198.531	1.78	198.531	2.08	0	472.631	111.316	95.274	$0
4312	24840	9150	100988	61803071	021E162T006	021E162T017	0.11	WEBSTER AVE	U	021E	STH 116 - LEONARDS POINT ROAD	268.680	0.00	1.0	1	1	2	0	1	9.1	0.0	0.0%	0.00	40.0%	0.00	40.0%	0.00	0	3				440	9270	1	0	0	0	0	5	0	0	WINNEBAGO	5	0.0186	0	0	0	0	0.000	0.00	0.000	0.00	0	427.027	93.714	79.538	$4,570
4313	24840	8337	100988	61803071	021E162T017	021E162T110	0.93	MADISON AVE	U	021E	STH 116 - LEONARDS POINT ROAD	197.493	0.00	7.2	4	6	5	12	9	7.7	0.0	0.0%	0.00	5.6%	0.00	61.1%	0.00	0	64				440	10740	8	0	0	9	5	22	2	1	WINNEBAGO	5	0.1823	0	0	9	8	49.373	0.00	49.373	0.00	0	340.621	60.362	49.724	$0
4314	24850	8337	100988	61803071	021E162T110	021E166 000	1.06	INDUSTRIAL DR	U	021E	STH 116 - LEONARDS POINT ROAD	86.636	0.00	3.6	2	2	2	6	6	3.4	0.2	5.6%	0.00	16.7%	0.00	66.7%	1.24	1	33	30	11	YES	430	10740	3	0	1	3	2	12	0	0	WINNEBAGO	5	0.2078	0	1	8	3	43.318	1.07	19.252	0.00	0	117.706	40.545	29.869	$14,010
4315	24860	8337	100988	61803071	021E166 000	021E168 000	1.57	RIVERMOOR RD	U	021E	STH 116 - LEONARDS POINT ROAD	71.492	0.00	4.4	5	2	5	4	6	2.8	0.0	0.0%	0.00	40.9%	0.00	22.7%	0.00	0	40				430	10740	8	0	0	6	3	13	0	0	WINNEBAGO	5	0.3077	0	0	7	8	22.747	0.00	19.498	0.00	0	113.869	38.447	28.118	$0
4316	24870	6712	100988	61803071	021E168 000	021E169 000	1.02	CTH FF	U	021E	STH 116 - LEONARDS POINT ROAD	106.568	0.00	4.4	7	0	6	5	4	4.3	0.4	9.1%	0.00	36.4%	0.00	54.5%	1.04	1	63	47	11	YES	430	11090	5	1	1	7	7	6	0	0	WINNEBAGO	5	0.2064	1	6	11	17	87.192	2.15	43.596	1.46	0	117.775	40.583	29.901	$715,536
4317	24880	6712	100988	61803071	021E169 000	021E170K000	1.35	SAND PIT RD	U	021E	STH 116 - LEONARDS POINT ROAD	135.417	1.18	7.4	5	9	7	9	7	5.5	0.2	2.7%	0.00	43.2%	1.09	24.3%	0.00	1	85	33	20	YES	430	11090	7	1	0	13	6	17	0	0	WINNEBAGO	5	0.2732	1	0	20	11	76.858	1.97	51.239	1.79	0	114.952	39.039	28.612	$404,004

ATTACHMENT B

Sites of **Promise** Documentation

Intersection Network Screening Spreadsheet

Intersection Network Screening

Updated: 1/3/2020

		Safety Certification Worksheet Information						Data Needed for SPFs																	SPF Results					
																									TOTAL Crashes (values for entire analysis period)			KABC Crashes (values for entire analysis period)		
		INT_ID	Intersection Name (IX_NAME)	LOSS (TOTAL	PSI (TOTAL	LOSS (KABC	PSI (KABC	Flagged Location (Yes/No)	Region	County	Area Type	Ramp Termini	Number of Le	Control Type	Median Type	Number of La	Major AAD	Minor AAD	Inside Ramp AAD	Outside Ramp AAD	Off Ramp AAD	On Ramp AAD	Number of Ramp	Total AAI	Years of Crash D	Crash Data Rang	Observed (TOTA	Predicted (TOTA	Expected (TOTA	Observed (KAB	Predicted (KAB	Expected (KABC
25419	IX_70_0237	STH 44 & Wright S	LOSS 2	-0.55	LOSS 2	-0.04	No	NE	Winnebago	URBAN	FALSE	3	TWSC	UNDIVIDED	1	3254	433	0	0	0	0	0	3687	5	2014 - 2018	0	1.27	0.72	0	0.26	0.22
25420	IX_70_0237	USH 45 & STH 44	LOSS 2	-0.47	LOSS 2	-0.02	No	NE	Winnebago	URBAN	FALSE	4	SIGNAL	UNDIVIDED	1	14480	1526	0	0	0	0	0	16006	5	2014 - 2018	23	23.55	23.08	7	7.03	7.01
25421	IX_70_0244	USH 45 & W Linco	LOSS 4	7.92	LOSS 4	1.57	Yes	NE	Winnebago	URBAN	FALSE	4	TWSC	UNDIVIDED	2	13976	433	0	0	0	0	0	14409	5	2014 - 2018	18	8.03	15.95	5	2.42	3.99
25422	IX_70_0248	STH 21 & N Oakwo	LOSS 3	4.44	LOSS 3	2.21	No	NE	Winnebago	URBAN	FALSE	4	SIGNAL	DITCH	2	17184	2035	0	0	0	0	0	19219	5	2014 - 2018	34	28.98	33.41	12	8.92	11.13
25423	IX_70_0249	STH 21 & Honey C	LOSS 3	0.82	LOSS 2	-0.25	No	NE	Winnebago	URBAN	FALSE	4	TWSC	DIVIDED	2	15824	127	0	0	0	0	0	15951	5	2014 - 2018	6	4.82	5.65	1	1.51	1.26
25424	IX_70_0251	USH 45 & Scott Av	LOSS 4	9.50	LOSS 4	1.57	Yes	NE	Winnebago	URBAN	FALSE	4	TWSC	UNDIVIDED	2	13976	433	0	0	0	0	0	14409	5	2014 - 2018	20	8.03	17.54	5	2.42	3.99
25425	IX_70_0252	STH 21 & Creek Si	LOSS 2	-1.68	LOSS 2	-0.34	No	NE	Winnebago	URBAN	FALSE	3	TWSC	DIVIDED	2	15824	127	0	0	0	0	0	15951	5	2014 - 2018	1	3.49	1.81	0	0.89	0.56
25426	IX_70_0254	USH 45 & W Melvi	LOSS 3	1.53	LOSS 3	0.77	No	NE	Winnebago	URBAN	FALSE	3	TWSC	UNDIVIDED	2	13976	433	0	0	0	0	0	14409	5	2014 - 2018	7	4.96	6.48	3	1.46	2.23
25427	IX_70_0254	STH 21 & Emmers	LOSS 1	-41.45	LOSS 1	-13.27	No	NE	Winnebago	URBAN	FALSE	4	SIGNAL	DITCH	2	27936	7937	0	0	0	0	0	35873	5	2014 - 2018	16	60.09	18.64	5	20.54	7.27
25428	IX_70_0259	USH 45 & Prospec	LOSS 4	4.74	LOSS 4	1.57	Yes	NE	Winnebago	URBAN	FALSE	4	TWSC	UNDIVIDED	2	13976	433	0	0	0	0	0	14409	5	2014 - 2018	14	8.03	12.77	5	2.42	3.99
25429	IX_70_0262	STH 116 & W Scott	LOSS 2	-0.02	LOSS 2	-0.06	No	NE	Winnebago	RURAL	FALSE	3	TWSC	UNDIVIDED	1	1570	914	0	0	0	0	0	2484	5	2014 - 2018	1	1.04	1.03	0	0.30	0.24
25430	IX_70_0263	USH 45 & Saratoga	LOSS 2	-1.46	LOSS 2	-0.73	No	NE	Winnebago	URBAN	FALSE	3	TWSC	UNDIVIDED	2	13976	433	0	0	0	0	0	14409	5	2014 - 2018	3	4.96	3.49	0	1.46	0.73
25431	IX_70_0264	STH 21 & Leonard	LOSS 4	11.14	LOSS 4	6.71	Yes	NE	Winnebago	URBAN	FALSE	3	TWSC	DIVIDED	2	15824	4884	0	0	0	0	0	20708	5	2014 - 2018	23	9.99	21.13	13	3.14	9.85
25432	IX_70_0264	STH 21 & N Washt	LOSS 2	-25.54	LOSS 1	-6.81	No	NE	Winnebago	URBAN	FALSE	4	RAB	RAISED	2	27936	6335	0	0	0	0	0	34271	5	2014 - 2018	34	60.72	35.18	5	13.74	6.93
25433	IX_70_0264	STH 21 & CTH FF	LOSS 4	3.21	LOSS 4	3.76	Yes	NE	Winnebago	RURAL	FALSE	4	TWSC	UNDIVIDED	1	11412	457	0	0	0	0	0	11869	5	2014 - 2018	10	5.56	8.77	8	1.67	5.43
25434	IX_70_0265	STH 21 & Marquar	LOSS 3	0.24	LOSS 3	0.48	No	NE	Winnebago	RURAL	FALSE	4	TWSC	UNDIVIDED	1	11412	110	0	0	0	0	0	11522	5	2014 - 2018	4	3.61	3.86	2	0.94	1.42
25435	IX_70_0265	STH 21 & Ramp IH	LOSS 3	5.70	LOSS 2	-0.24	No	NE	Winnebago	URBAN	TRUE	4	RAB	RAISED	2	16850	15900	17700	16000	6300	9600	2	32750	5	2014 - 2018	30	23.97	29.67	4	4.31	4.08
25436	IX_70_0265	STH 21 & Ramp IH	LOSS 2	-8.78	LOSS 3	0.48	No	NE	Winnebago	URBAN	TRUE	4	RAB	RAISED	2.5	16850	16400	16000	17700	9600	6800	2	33250	5	2014 - 2018	15	24.28	15.50	5	4.37	4.85
25437	IX_70_0266	STH 21 & Sand Pit	LOSS 4	9.04	LOSS 4	4.10	Yes	NE	Winnebago	RURAL	FALSE	4	TWSC	UNDIVIDED	1	11412	110	0	0	0	0	0	11522	5	2014 - 2018	18	3.61	12.65	10	0.94	5.04
25438	IX_70_0267	STH 21 & N Koelle	LOSS 1	-38.12	LOSS 1	-6.53	No	NE	Winnebago	URBAN	FALSE	4	RAB	RAISED	2	22218	5265	0	0	0	0	0	27483	5	2014 - 2018	10	50.25	12.13	1	10.05	3.53
25439	IX_70_0270	USH 45 & W New	LOSS 4	26.50	LOSS 4	6.33	Yes	NE	Winnebago	URBAN	FALSE	4	SIGNAL	UNDIVIDED	2	14576	3894	0	0	0	0	0	18470	5	2014 - 2018	60	30.14	56.64	18	9.27	15.60
25440	IX_70_0275	STH 21 & N Westfi	LOSS 1	-20.78	LOSS 1	-5.72	No	NE	Winnebago	URBAN	FALSE	3	SIGNAL	UNDIVIDED	2	20170	3867	0	0	0	0	0	24037	5	2014 - 2018	2	25.23	4.44	0	7.58	1.86
25441	IX_70_0275	STH 21 & E Scott S	LOSS 3	0.38	LOSS 3	0.14	No	NE	Winnebago	RURAL	FALSE	3	TWSC	UNDIVIDED	1	10384	110	0	0	0	0	0	10494	5	2014 - 2018	3	2.33	2.71	1	0.44	0.59
25442	IX_70_0276	STH 116 & W Larra	LOSS 2	-0.01	LOSS 2	-0.06	No	NE	Winnebago	RURAL	FALSE	4	TWSC	UNDIVIDED	1	1446	374	0	0	0	0	0	1820	5	2014 - 2018	1	1.04	1.03	0	0.30	0.24
25443	IX_70_0279	STH 21 & N Eagle	LOSS 2	-5.35	LOSS 2	-1.56	No	NE	Winnebago	URBAN	FALSE	4	TWSC	UNDIVIDED	2	19010	433	0	0	0	0	0	19443	5	2014 - 2018	4	10.42	5.07	1	3.29	1.73
25444	IX_70_0279	STH 21 & N Sawye	LOSS 1	-19.16	LOSS 1	-7.07	No	NE	Winnebago	URBAN	FALSE	3	SIGNAL	RAISED	2	22498	7428	0	0	0	0	0	29926	5	2014 - 2018	9	30.06	10.89	0	9.01	1.94
25445	IX_70_0279	STH 21 & Punhoqu	LOSS 1	-8.68	LOSS 1	-2.24	No	NE	Winnebago	URBAN	FALSE	4	TWSC	UNDIVIDED	2	19010	433	0	0	0	0	0	19443	5	2014 - 2018	0	10.42	1.74	0	3.29	1.05
25446	IX_70_0279	STH 21 & High Ave	LOSS 2	-13.94	LOSS 2	-3.66	No	NE	Winnebago	URBAN	FALSE	4	SIGNAL	RAISED	1.5	22498	2940	0	0	0	0	0	25438	5	2014 - 2018	24	39.30	25.36	8	12.67	9.01
25447	IX_70_0279	STH 21 & Arboretu	LOSS 1	-9.38	LOSS 1	-2.78	No	NE	Winnebago	URBAN	FALSE	4	TWSC	UNDIVIDED	2	22498	433	0	0	0	0	0	22931	5	2014 - 2018	1	12.01	2.63	0	3.89	1.11
25448	IX_70_0280	STH 21 & Fox St	LOSS 1	-5.27	LOSS 2	-1.24	No	NE	Winnebago	URBAN	FALSE	3	TWSC	UNDIVIDED	2	19010	433	0	0	0	0	0	19443	5	2014 - 2018	0	6.60	1.34	0	2.11	0.87
25449	IX_70_0280	STH 21 & Algoma	LOSS 1	-16.22	LOSS 1	-4.69	No	NE	Winnebago	URBAN	FALSE	4	SIGNAL	RAISED	2	11550	6242	0	0	0	0	0	17792	5	2014 - 2018	10	28.40	12.18	2	8.61	3.91
25450	IX_70_0280	STH 21 & Rainbow	LOSS 2	-3.14	LOSS 2	-1.21	No	NE	Winnebago	URBAN	FALSE	3	TWSC	RAISED	2	22498	433	0	0	0	0	0	22931	5	2014 - 2018	3	6.90	3.76	0	2.06	0.86
25451	IX_70_0282	USH 45 & Annex A	LOSS 3	0.64	LOSS 2	-0.27	No	NE	Winnebago	URBAN	FALSE	3	TWSC	UNDIVIDED	2	14576	433	0	0	0	0	0	15009	5	2014 - 2018	6	5.15	5.79	1	1.54	1.26
25452	IX_70_0285	STH 21	LOSS 4	16.34	LOSS 4	1.57	Yes	NE	Winnebago	URBAN	FALSE	3	OTHER	RAISED	2	12418	5860	0	0	0	0	0	18278	5	2014 - 2018	28	8.40	24.74	5	2.50	4.08
25453	IX_70_0286	USH 45 & Congres	LOSS 4	4.41	LOSS 3	0.75	Yes	NE	Winnebago	URBAN	FALSE	3	TWSC	UNDIVIDED	2	14576	433	0	0	0	0	0	15009	5	2014 - 2018	11	5.15	9.57	3	1.54	2.28
25454	IX_70_0287	STH 116 & W Onta	LOSS 2	-0.01	LOSS 2	-0.06	No	NE	Winnebago	RURAL	FALSE	4	TWSC	UNDIVIDED	1	1446	374	0	0	0	0	0	1820	5	2014 - 2018	1	1.04	1.03	0	0.30	0.24
25455	IX_70_0289	USH 45 & W Neva	LOSS 2	-3.46	LOSS 2	-1.56	No	NE	Winnebago	URBAN	FALSE	4	TWSC	UNDIVIDED	2	14576	433	0	0	0	0	0	15009	5	2014 - 2018	4	8.32	4.86	0	2.52	0.96
25456	IX_70_0290	STH 21 & Rivermo	LOSS 4	2.84	LOSS 3	0.06	Yes	NE	Winnebago	RURAL	FALSE	4	TWSC	UNDIVIDED	1	10384	110	0	0	0	0	0	10494	5	2014 - 2018	8	3.35	6.19	1	0.87	0.93
25457	IX_70_0292	STH 116 & W Huro	LOSS 4	0.97	LOSS 2	-0.06	Yes	NE	Winnebago	RURAL	FALSE	4	TWSC	UNDIVIDED	1	1446	374	0	0	0	0	0	1820	5	2014 - 2018	4	1.04	2.01	0	0.30	0.24
25458	IX_70_0295	STH 21 & Arboretu	LOSS 2	-1.76	LOSS 2	-0.09	No	NE	Winnebago	URBAN	FALSE	4	TWSC	UNDIVIDED	2	12418	433	0	0	0	0	0	12851	5	2014 - 2018	5	7.27	5.51	2	2.15	2.06
25459	IX_70_0296	USH 45 & W Bent	LOSS 3	0.54	LOSS 2	-0.33	No	NE	Winnebago	URBAN	FALSE	4	TWSC	UNDIVIDED	2	14576	433	0	0	0	0	0	15009	5	2014 - 2018	9	8.32	8.86	2	2.52	2.20
25460	IX_70_0297	STH 21 & Adams A	LOSS 2	-0.36	LOSS 2	-0.95	No	NE	Winnebago	RURAL	FALSE	4	OTHER	UNDIVIDED	1	12166	374	0	0	0	0	0	12540	5	2014 - 2018	5	5.50	5.14	0	1.62	0.67

Intersection Network Screening

Updated: 1/3/2020

	Safety Certification Worksheet Information							Data Needed for SPFs																	SPF Results					
																									TOTAL Crashes (values for entire analysis period)			KABC Crashes (values for entire analysis period)		
	INT_ID	Intersection Name (IR_NAME)	LOSS (TOTAL	PSI (TOTAL	LOSS (KABC	PSI (KABC	Flagged Location (Yes/No)	Region	County	Area Type	Ramp Termini	Number of Le	Control Type	Median Type	Number of Lan	Major AADT	Minor AADT	Inside Ramp AADT	Outside Ramp AADT	Off Ramp AADT	On Ramp AADT	Number of Ramp	Total AADT	Years of Crash D	Crash Data Range	Observed (TOTA	Predicted (TOTA	Expected (TOTA	Observed (KAB	Predicted (KAB	Expected (KABC
25458	IX_70_02952	STH 21 & Arboretu	LOSS 2	-1.76	LOSS 2	-0.09	No	NE	Winnebago	URBAN	FALSE	4	TWSC	UNDIVIDED	2	12418	433	0	0	0	0	0	12851	5	2014 - 2018	5	7.27	5.51	2	2.15	2.06
25459	IX_70_02968	USH 45 & W Bent	LOSS 3	0.54	LOSS 2	-0.33	No	NE	Winnebago	URBAN	FALSE	4	TWSC	UNDIVIDED	2	14576	433	0	0	0	0	0	15009	5	2014 - 2018	9	8.32	8.86	2	2.52	2.20
25460	IX_70_02973	STH 21 & Adams A	LOSS 2	-0.36	LOSS 2	-0.95	No	NE	Winnebago	RURAL	FALSE	4	OTHER	UNDIVIDED	1	12166	374	0	0	0	0	0	12540	5	2014 - 2018	5	5.50	5.14	0	1.62	0.67
25461	IX_70_02975	STH 21 & STH 116	LOSS 4	3.97	LOSS 4	0.84	Yes	NE	Winnebago	RURAL	FALSE	3	TWSC	UNDIVIDED	1	12166	1446	0	0	0	0	0	13612	5	2014 - 2018	10	4.48	8.45	3	1.35	2.19
25462	IX_70_02976	STH 21 & Webster	LOSS 3	1.07	LOSS 2	-0.39	No	NE	Winnebago	RURAL	FALSE	3	TWSC	UNDIVIDED	1	9196	914	0	0	0	0	0	10110	5	2014 - 2018	5	3.37	4.44	0	0.94	0.55
25463	IX_70_02977	STH 21 & Madison	LOSS 4	2.39	LOSS 3	0.02	Yes	NE	Winnebago	RURAL	FALSE	3	TWSC	UNDIVIDED	1	9196	914	0	0	0	0	0	10110	5	2014 - 2018	7	3.37	5.76	1	0.94	0.97
25464	IX_70_02978	STH 21 & Monroe S	LOSS 3	0.62	LOSS 4	0.45	Yes	NE	Winnebago	RURAL	FALSE	3	TWSC	UNDIVIDED	1	10384	374	0	0	0	0	0	10758	5	2014 - 2018	4	3.02	3.64	2	0.72	1.17
25465	IX_70_02980	STH 21 & Quincy A	LOSS 3	0.62	LOSS 4	1.16	Yes	NE	Winnebago	RURAL	FALSE	3	TWSC	UNDIVIDED	1	10384	374	0	0	0	0	0	10758	5	2014 - 2018	4	3.02	3.64	4	0.72	1.88
25466	IX_70_02981	STH 21 & Jackson	LOSS 3	1.25	LOSS 3	0.10	No	NE	Winnebago	RURAL	FALSE	3	TWSC	UNDIVIDED	1	10384	374	0	0	0	0	0	10758	5	2014 - 2018	5	3.02	4.28	1	0.72	0.82
25467	IX_70_02982	STH 21 & Van Bur	LOSS 2	-0.65	LOSS 2	-0.25	No	NE	Winnebago	RURAL	FALSE	3	TWSC	UNDIVIDED	1	10384	374	0	0	0	0	0	10758	5	2014 - 2018	2	3.02	2.37	0	0.72	0.46
25468	IX_70_02985	STH 21 & Harrison	LOSS 2	-2.68	LOSS 2	-0.79	No	NE	Winnebago	RURAL	FALSE	4	TWSC	UNDIVIDED	1	10384	374	0	0	0	0	0	10758	5	2014 - 2018	1	4.86	2.18	0	1.43	0.63
25469	IX_70_03014	USH 45 & Stanley	LOSS 2	-0.87	LOSS 2	-0.79	No	NE	Winnebago	URBAN	FALSE	3	TWSC	UNDIVIDED	2	14576	433	0	0	0	0	0	15009	5	2014 - 2018	4	5.15	4.28	0	1.54	0.75
25470	IX_70_03018	STH 21 & Maplewo	LOSS 2	-0.65	LOSS 3	0.10	No	NE	Winnebago	RURAL	FALSE	3	TWSC	UNDIVIDED	1	10384	374	0	0	0	0	0	10758	5	2014 - 2018	2	3.02	2.37	1	0.72	0.82
25471	IX_70_03020	STH 21 & Hollister	LOSS 2	-1.77	LOSS 2	-0.13	No	NE	Winnebago	URBAN	FALSE	3	TWSC	UNDIVIDED	2	12418	433	0	0	0	0	0	12851	5	2014 - 2018	2	4.44	2.67	1	1.27	1.15
25472	IX_70_03023	STH 21 & Lincoln A	LOSS 2	-0.65	LOSS 2	-0.25	No	NE	Winnebago	RURAL	FALSE	3	TWSC	UNDIVIDED	1	10384	374	0	0	0	0	0	10758	5	2014 - 2018	2	3.02	2.37	0	0.72	0.46
25473	IX_70_03024	STH 21 & Beckwith	LOSS 3	0.62	LOSS 4	0.45	Yes	NE	Winnebago	RURAL	FALSE	3	TWSC	UNDIVIDED	1	10384	374	0	0	0	0	0	10758	5	2014 - 2018	4	3.02	3.64	2	0.72	1.17
25474	IX_70_03026	STH 21 & McKinle	LOSS 3	0.62	LOSS 4	0.45	Yes	NE	Winnebago	RURAL	FALSE	3	TWSC	UNDIVIDED	1	10384	374	0	0	0	0	0	10758	5	2014 - 2018	4	3.02	3.64	2	0.72	1.17
25475	IX_70_03027	STH 21 & Omreau	LOSS 2	-0.65	LOSS 3	0.10	No	NE	Winnebago	RURAL	FALSE	3	TWSC	UNDIVIDED	1	10384	374	0	0	0	0	0	10758	5	2014 - 2018	2	3.02	2.37	1	0.72	0.82
25476	IX_70_03028	STH 21 & Goldenro	Missing Data	Missing Data	Missing Data	Missing Data	Missing Data	NE	Winnebago	RURAL	FALSE	3	TWSC	UNDIVIDED	1	10384	0	0	0	0	0	0	10384	5	2014 - 2018	1	Missing Da	Missing Dat	0	Missing Da	Missing Dat
25477	IX_70_03030	STH 21 & Industria	LOSS 2	-1.12	LOSS 3	0.43	No	NE	Winnebago	RURAL	FALSE	3	TWSC	UNDIVIDED	1	10384	914	0	0	0	0	0	11298	5	2014 - 2018	2	3.66	2.54	2	1.02	1.45
25478	IX_70_03034	STH 21 & Alder Av	LOSS 4	4.27	LOSS 4	1.43	Yes	NE	Winnebago	RURAL	FALSE	4	TWSC	UNDIVIDED	1	10384	374	0	0	0	0	0	10758	5	2014 - 2018	11	4.86	9.13	4	1.43	2.86
25479	IX_70_03043	STH 21 & Brooke D	LOSS 3	0.10	LOSS 2	-0.79	No	NE	Winnebago	RURAL	FALSE	4	TWSC	UNDIVIDED	1	10384	374	0	0	0	0	0	10758	5	2014 - 2018	5	4.86	4.96	0	1.43	0.63
25480	IX_70_03053	USH 45 & Hobbs A	LOSS 3	1.76	LOSS 4	0.81	Yes	NE	Winnebago	URBAN	FALSE	3	TWSC	RAISED	2	14576	433	0	0	0	0	0	15009	5	2014 - 2018	7	4.60	6.36	3	1.23	2.04
25481	IX_70_03068	USH 45 & STH 21	LOSS 3	5.36	LOSS 2	-0.19	No	NE	Winnebago	URBAN	FALSE	3	SIGNAL	RAISED	2	12418	8010	0	0	0	0	0	20428	5	2014 - 2018	22	15.62	20.98	4	4.29	4.11
25482	IX_70_03069	USH 45 & Plymout	LOSS 1	-2.53	LOSS 2	-0.41	No	NE	Winnebago	URBAN	FALSE	3	TWSC	UNDIVIDED	2	10146	433	0	0	0	0	0	10579	5	2014 - 2018	0	3.68	1.15	0	1.00	0.60
25483	IX_70_03070	USH 45 & Sheridar	LOSS 2	-3.08	LOSS 2	-0.40	No	NE	Winnebago	URBAN	FALSE	4	TWSC	UNDIVIDED	2	10146	433	0	0	0	0	0	10579	5	2014 - 2018	2	6.13	3.05	1	1.76	1.36
25484	IX_70_03071	USH 45 & Crane S	LOSS 2	-1.15	LOSS 2	0.00	No	NE	Winnebago	URBAN	FALSE	3	TWSC	UNDIVIDED	2	10146	433	0	0	0	0	0	10579	5	2014 - 2018	2	3.68	2.52	1	1.00	1.00
25485	IX_70_03072	USH 45 & Olive St	LOSS 2	-1.84	LOSS 2	-0.41	No	NE	Winnebago	URBAN	FALSE	3	TWSC	UNDIVIDED	2	10146	433	0	0	0	0	0	10579	5	2014 - 2018	1	3.68	1.84	0	1.00	0.60
25486	IX_70_03073	USH 45 & Mitchell	LOSS 2	-1.15	LOSS 2	-0.41	No	NE	Winnebago	URBAN	FALSE	3	TWSC	UNDIVIDED	2	10146	433	0	0	0	0	0	10579	5	2014 - 2018	2	3.68	2.52	0	1.00	0.60
25487	IX_70_03074	USH 45 & Elmwoo	LOSS 3	2.21	LOSS 4	2.19	Yes	NE	Winnebago	URBAN	FALSE	4	TWSC	UNDIVIDED	2	11350	2544	0	0	0	0	0	13894	5	2014 - 2018	16	13.45	15.66	7	3.95	6.14
25488	IX_70_03075	USH 45 & Walnut S	LOSS 2	-2.19	LOSS 2	-0.50	No	NE	Winnebago	URBAN	FALSE	3	TWSC	UNDIVIDED	2	11350	433	0	0	0	0	0	11783	5	2014 - 2018	1	4.08	1.90	0	1.14	0.64
25489	IX_70_03076	USH 45 & Cedar S	LOSS 2	-0.77	LOSS 3	0.37	No	NE	Winnebago	URBAN	FALSE	3	TWSC	UNDIVIDED	2	11350	433	0	0	0	0	0	11783	5	2014 - 2018	3	4.08	3.31	2	1.14	1.52
25490	IX_70_03077	USH 45 & Beech S	LOSS 2	-2.85	LOSS 2	-1.10	No	NE	Winnebago	URBAN	FALSE	4	TWSC	UNDIVIDED	2	11350	433	0	0	0	0	0	11783	5	2014 - 2018	3	6.74	3.88	0	1.97	0.87
25491	IX_70_03078	USH 45 & Liberty S	LOSS 2	-2.19	LOSS 2	-0.06	No	NE	Winnebago	URBAN	FALSE	3	TWSC	UNDIVIDED	2	11350	433	0	0	0	0	0	11783	5	2014 - 2018	1	4.08	1.90	1	1.14	1.08
25492	IX_70_03079	USH 45 & Western	LOSS 2	-0.77	LOSS 2	-0.50	No	NE	Winnebago	URBAN	FALSE	3	TWSC	UNDIVIDED	2	11350	433	0	0	0	0	0	11783	5	2014 - 2018	3	4.08	3.31	0	1.14	0.64
25493	IX_70_03080	USH 45 & STH 76	LOSS 4	54.20	LOSS 4	18.72	Yes	NE	Winnebago	URBAN	FALSE	4	RAB	RAISED	2	18786	11905	0	0	0	0	0	30691	5	2014 - 2018	112	55.04	109.24	36	10.00	28.72
25494	IX_70_03082	STH 116 & Webste	LOSS 4	1.55	LOSS 3	0.12	Yes	NE	Winnebago	RURAL	FALSE	3	TWSC	UNDIVIDED	1	5000	914	0	0	0	0	0	5914	5	2014 - 2018	5	2.25	3.80	1	0.63	0.75
25495	IX_70_03083	USH 45 & Ontario	LOSS 2	-2.19	LOSS 2	-0.50	No	NE	Winnebago	URBAN	FALSE	3	TWSC	UNDIVIDED	2	11350	433	0	0	0	0	0	11783	5	2014 - 2018	1	4.08	1.90	0	1.14	0.64
25496	IX_70_03084	USH 45 & Wiscon	LOSS 3	8.83	LOSS 3	0.86	No	NE	Winnebago	URBAN	FALSE	4	SIGNAL	UNDIVIDED	2	11350	4579	0	0	0	0	0	15929	5	2014 - 2018	36	25.87	34.69	9	7.74	8.61
25497	IX_70_03085	STH 116 & Cedar S	LOSS 2	-0.44	LOSS 2	-0.11	No	NE	Winnebago	RURAL	FALSE	3	TWSC	UNDIVIDED	1	5000	374	0	0	0	0	0	5374	5	2014 - 2018	1	1.86	1.42	0	0.45	0.33
25498	IX_70_03093	STH 21 & STH 116	LOSS 4	5.60	LOSS 3	0.54	Yes	NE	Winnebago	RURAL	FALSE	4	SIGNAL	PCR	1	12166	374	0	0	0	0	0	12540	5	2014 - 2018	20	12.51	18.11	4	2.94	3.48
25499	IX_70_03096	STH 116 & Oak St	LOSS 4	1.11	LOSS 2	-0.04	Yes	NE	Winnebago	RURAL	FALSE	3	TWSC	UNDIVIDED	1	2136	374	0	0	0	0	0	2510	5	2014 - 2018	4	1.06	2.17	0	0.26	0.22

ATTACHMENT C

Crash Vetting Documentation

WisTransPortal crash data spreadsheet with vetting comments

CORRIDORID	CUMULMILE	PDPID	DOCTNMBR	ACCDDATE	DAYNMBR	NTFYHOUR	Comments	REGION	CNTYCODE	COUNTY	MUNICODE	MUNICIPALITY	MUNITYPE	ONHWYRP	ONHWYDIR	RPNMBR	RPDIS	ONHWY	ONSTR	ATHWY	ATSTR	ATNMBR	INTDIR	INTDIS	ACCDTYPE	MNRCOLL	RLTNRDWY	ACCDLOC	HWYCLASS	TRFCWAY	ROADCOND	WTHRCOND	LGTCOND	ROADHOR	ROADVERT	ACCDSVR	INJSVR	INJTRNS	TOTFATL	TOTINJ	TOTVEH	VEHTYPE1	VEHDMG1	TRVLDIR1	DRVRDO1	TRFCNTL1	POSTSPD1	AGE1	SEX1	INJSVR1	SAFETY1	STNM11	STNM12	VEHTYPE2	VEHDMG2	TRVLDIR2	DRVRDO2	TRFCNTL2	POSTSPD2	AGE2	SEX2	INJSVR2	SAFETY2	STNM21	STNM22	ACCDNMBR	MCFLNMBR
1	112.35	4284	CH5P4W8	8/24/2016	WED	15	WB left turn rear end	NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	0	21	WB	116					0		REAR	ON	I	R STH	ND	WET	RAIN				PD			0	0	2	CAR	MNR	W	SL/ST	NONE	25	35	M		SH/LP			CAR	MOD	W	GO STR	NONE	25	18	M		SH/LP	346.89 1		160806187	1600CH5P4W8
1	112.35	4284	2PL0QJJ8WV	4/1/2017	SAT	18	WB left turn rear end	NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	0	21	W MAIN ST	116					0		REAR	ON	I	R STH	ND		CLR				INJ	C		0	1	2	CAR	MOD	W	BLNK	NONE	25	51	M		UNKN	346.14(1)	346.67(1)	CAR	MOD	W	BLNK	NONE	25	33	F	C	SH/LP			170400466	
1	112.35	4284	CH56BF3	6/28/2014	SAT	16	WB left turn rear end, dropped cell phone	NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	0	21	W MAIN ST	116	JEFFERSON AVE			0		REAR	ON	I	R STH	ND		CLR				INJ	B		0	1	2	CAR	SVR	W	LT TRN	NONE	25	28	M		SH/LP			CAR	SVR	W	GO STR	NONE	25	23	M	B	SH/LP	346.89 1	344.62 1	140607419	1400CH56BF3
1	112.35	4284	2NL01PTJN8	11/9/2018	FRI	13	NB fail to yield to WB	NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	0	21	W MAIN ST	116	JEFFERSON AVE			0		ANGL	ON	I	R STH	ND		CLR				PD			0	0	2	CAR	MOD	E	GO STR	NONE	25	79	M		SH/LP			CAR	MNR	N	LT TRN	SS	25	46	M		SH/LP			181104243	
1	112.35	4284	CH5PW43	10/7/2016	FRI	21	WB yield to pedestrian rear ended	NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	0	21	W MAIN ST	116	JEFFERSON AVE		E	1		REAR	ON	N	R STH	ND		CLDY	LIGT			PD			0	0	2	TRK SA	NONE	W	STOPED	NONE	25	54	M		SH/LP			CAR	MOD	W	GO STR	NONE	25	55	M		SH/LP	346.14 1		161001586	1600CH5PW43
1	112.38	4284	CH56BFD	6/13/2015	SAT	14	WB slowing for stopped vehicles rear ended	NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	0.03	21	W MAIN ST		WEBSTER AVE S		W	3		REAR	ON	N	R STH	ND	WET	RAIN				PD			0	0	3	CAR	MOD	W	STOPED	NONE	25	39	F		SH/LP			CAR	MOD	W	GO STR	NONE	25	20	M		SH/LP			150602998	1500CH56BFD
1	112.38	4284	2NL01S9LVX	6/11/2017	SUN	17	Crash not at W Main & Jefferson	NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	0.03	21	W MAIN ST	116			E	3		REAR	ON	I	R STH	ND		CLDY		C		PD			0	0	2	TRK UT	NONE	E	RT TRN	TS OP	25	57	M		SH/LP			CAR	SVR	E	RT TRN	TS OP	25	26	M		SH/LP			170605332	
1	112.38	4284	2NL01VRP3X	2/24/2018	SAT	12	WB rear end of left turn into driveway	NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	0.03	21	W MAIN ST	116	JEFFERSON AVE		E	3		REAR	ON	N	R STH	ND		CLDY				INJ	B		0	1	2	CAR	MOD	E	GO STR	NONE	25	40	F		SH/LP			CAR	MNR	E	SL/ST	NONE	25	40	F	B	SH/LP			180209172	
1	112.4	4284	CH5PW34	5/6/2015	WED	14	WB yield to pedestrian rear ended	NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	0.05	21			WEBSTER AVE S	100	W	1		REAR	ON	I	R STH	ND		CLDY				PD			0	0	2	CAR	MOD	E	GO STR	NONE	25	17	M		SH/LP			CAR	V MNR	E	GO STR	NONE	25	16	M		SH/LP			150500614	1500CH5PW34
1	112.4	4284	CH5L5ZG	6/20/2014	FRI	7	WB yield to bikes in crosswalk rear ended	NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	0.05	21	MAIN ST		WEBSTER AVE S		W	1		REAR	ON	I	R STH	ND	WET	RAIN				PD			0	0	2	TRK UT	SVR	E	GO STR	NONE	25	39	M		SH/LP			TRK UT	MOD	E	STOPED	NONE	25	54	F		SH/LP			140604882	1400CH5L5ZG
1	112.41	4285	2NL01S9LWL	5/23/2018	WED	7		NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	0.06	21	W MAIN ST		WEBSTER AVE S			0		REAR	ON	I	R STH	ND		CLR	DAWN			PD			0	0	2	CAR	MNR	W	GO STR	NONE	20	17	M		SH/LP			TRK UT	NONE	W	LT TRN	NONE	5	38	M		SH/LP			180506793	
1	112.42	4285	CH5MNDT	9/19/2016	MON	7		NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	0.07	21	E MAIN ST		WEBSTER AVE S	103	E	1		REAR	ON	I	R STH	ND		CLR				PD			0	0	2	CAR	MOD	W	STOPED	NONE	25	18	M		SH/LP			CAR	MNR	W	GO STR	NONE	25	24	M		SH/LP	346.14 1		160904236	1600CH5MNDT
1	112.43	4285	CH5LX7F	6/25/2016	SAT	10		NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	0.08	21	E MAIN ST	117	WEBSTER AVE S	117	E	2		SSS	ON	N	R STH	ND		CLR				PD			0	0	2	CAR	MOD	W	MERGNG	NONE	25	16	F		SH/LP			TRK UT	V MNR	W	GO STR	NONE	25	55	M		SH/LP			160607762	1600CH5LX7F
1	112.47	4285	2NL01VRP3M	8/16/2017	WED	21	Pulled out of driveway causing M/C to lose control	NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	0.12	21			MADISON AVE		W	5	OVRTRN	NO	ON	N	R STH	ND	WET	CLDY	DARK			PD			0	0	2	CYCLE	MNR	E	GO STR	NONE	25	21	F		HT/EY	343.07(4)(b)2		TRK UT	NONE	E	RT TRN	NONE	25	18	M		NONE	346.18(4)		170807111	
1	112.49	4285	CH5L604	9/25/2014	THU	18	Hit & Run while parked left scene	NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	0.14	21	E MAIN ST		MADISON AVE	163	W	3		UNKN	ON	N	R STH	ND		CLR				PD			0	0	2	CAR	MNR		LG PRK	NONE	25	0	N						CAR	UNKN	W	GO STR	NONE	25	0	N		UNKN			140906449	1400CH5L604
1	112.52	4286	CH5LX62	3/16/2014	SUN	17	Ped hit by bypassing WB vehicle	NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	0.17	21	E MAIN ST		MADISON AVE			0		NO	ON	I	R STH	ND		CLR				INJ	B	Y	0	1	1	CAR	MNR	W	OVT RT	NONE	25	20	F		SH/LP	346.24 3						OTHR		24	M	B	NA			140303646	1400CH5LX62
1	112.52	4286	CH5LX7N	12/4/2016	SUN	12	NB fail to yield to EB, snowy/slushy roads	NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	0.17	21			MADISON AVE			0		ANGL	ON	I	R STH	ND	SNOW	SNOW				PD			0	0	2	CAR	MNR	E	GO STR	NONE	25	31	F		SH/LP			CAR	MOD	N	LT TRN	SS	25	29	F		SH/LP			161200321	1600CH5LX7N
1	112.52	4286	2NL01VRP46	8/1/2018	WED	13	NB fail to yield to WB, causeing WB Side swipe of parked vehicle	NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	0.17		MADISON AVE	21		163	S	1		NO	ON	I	R CITY	ND		CLR				PD			0	0	3	CAR	UNKN	W	BLNK	SS		0	N		NONE			CAR	MOD	W	GO STR	NONE	25	28	M		SH/LP			180800046	
1	112.55	4286	2NL01TJN03	5/5/2017	FRI	22	EB rear end mid-block	NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	0.2	21			MADISON AVE		E	3		REAR	ON	N	R STH	ND		CLR				PD			0	0	2	CAR	NONE	E	BLNK	NONE	25	17	M		SH/LP			CAR	MNR	E	BLNK	NONE	25	16	M		SH/LP			170500885	
1	112.55	4286	CH5P4VG	7/4/2015	SAT	19	WB rear end mid-block	NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	0.2	21	E MAIN ST		MADISON AVE		E	3		REAR	ON	N	R STH	ND		CLR				PD			0	0	2	CAR	SVR	W	GO STR	NONE	25	19	M		SH/LP			CAR	MNR	W	SL/ST	NONE	25	21	M		SH/LP			150700300	1500CH5P4VG
1	112.57	4286	2NL01S9LWF	3/27/2018	TUE	0	WB rear end turning left into Kwik Trip	NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	0.22	21			MONROE ST		W	3		REAR	ON	N	R STH	ND	WET	RAIN	LIGT			PD			0	0	2	TRK UT	NONE	W	SL/ST	NONE	25	50	M		SH/LP			CAR	SVR	W	GO STR	NONE	25	19	F		SH/LP			180307526	
1	112.6	4286	CH5LX63	3/18/2014	TUE	17	WB rear end turning left onto Monroe	NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	0.25	21	E MAIN ST		MONROE ST			0		REAR	ON	I	R STH	ND		CLDY				PD			0	0	2	TRK UT	MNR	W	SL/ST	NONE	25	67	M		SH/LP			CAR	MOD	W	GO STR	NONE	25	24	M		SH/LP	346.89 1		140304518	1400CH5LX63
1	112.6	4286	CH5PW3B	7/16/2015	THU	11	WB driver drifted north and struck parked vehicle	NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	0.25	21	E MAIN ST		MONROE ST	304	E	1		REAR	ON	I	R STH	ND		CLR				INJ	B		0	1	2	CAR	SVR		LG PRK	NONE	77	0	N						CAR	SVR	W	GO STR	NONE	25	72	F	B	SH/LP			150703514	1500CH5PW3B
1	112.63	4286	CH56BFN	12/23/2016	FRI	15	WB rear end turning left onto Monroe during snowy pavement	NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	0.28	21			MONROE ST		E	3		REAR	ON	N	R STH	ND	SNOW	SNOW				INJ	B	Y	0	1	3	CAR	SVR	W	LT TRN	NONE	25	20	F		SH/LP			TRK UT	V MNR	W	GO STR	NONE	25	21	M		SH/LP	346.89 1	346.14 1	161211934	1600CH56BFN
1	112.63	4286	2NL00ZLVNK	11/2/2017	THU	18	WB rear end turning into driveway	NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	0.28	21			QUINCY AVE		W	3		REAR	ON	N	R STH	ND		CLDY	LIGT			INJ	C		0	1 Y	2	CAR	MNR	W	GO STR	NONE	25	20	M		SH/LP			CAR	UNKN	W	GO STR	NONE	25	55	F		UNKN	344.62(1)	346.14(1)	171115684	
1	112.65	4286	CH5PW3D	7/23/2015	THU	17	WB rear end to WB vehicle yielding to pedestrian in 300 block, ped not in crosswalk	NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	0.3	21	E MAIN ST		QUINCY AVE	328	W	2		REAR	ON	N	R STH	ND		CLR				INJ	C		0	1	2	CAR	UNKN	E	GO STR	NONE	25	0	N		UNKN			CAR	MNR	E	SL/ST	NONE	25	16	F	C	SH/LP			150708244	1500CH5PW3D
1	112.66	4286	CH5MNDS	7/16/2015	THU	11	WB left turn into driveway failed to yield R/W to EB through	NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	0.31	21	E MAIN ST		QUINCY AVE	328	W	4		ANGL	ON	N	R STH	ND		CLDY				INJ	C		0	1	2	CAR	MOD	E	GO STR	NONE	25	52	F	C	SH/LP			TRK UT	MOD	S	LT TRN	NONE	25	65	M		SH/LP			150703513	1500CH5MNDS
1	112.66	4286	2NL00ZLVND	6/1/2017	THU	17	WB left turn onto Quincy failed to yield R/W to EB Bike	NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	0.31	21			QUINCY AVE			0	BIKE	NO	ON	I	R STH	ND		CLR				INJ	B		0	1	1	CAR	MNR	W	LT TRN	NONE	25	52	M		SH/LP	346.89(1)		BIKE	MNR	E	BLNK	NONE	25	43	M	B				170600034	
1	112.74	4286	2NL00ZLVNB	5/27/2017	SAT	15		NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	0.39	21			JACKSON AVE		W	1		REAR	ON	I	R STH	ND		CLR				PD			0	0	2	CAR	MOD	E	BLNK	NONE	25	22	F		SH/LP			CAR	SVR	E	BLNK	NONE	25	17	M		SH/LP	346.89(1)		170508132	
1	112.75	4286	2NL01VRP3H	5/31/2017	WED	16	WB bike on sidewalk failed to yield to NB right turn on Jackson Ave.	NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	0.4		JACKSON AVE	21				0		ANGL	ON	I	R CITY	ND		CLR				INJ	B		0	1	1	BIKE	MOD	W	GO STR	SS	25	22	M	B				CAR	MNR	N	RT TRN	SS	25	33	F		SH/LP			170509716	
1	112.75	4286	CH5PW2Z	2/27/2015	FRI	12		NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	0.4	21	E MAIN ST		JACKSON AVE			0	BRPIER	NO	ON	I	R STH	ND		CLR				PD			0	0	1	CAR	MNR	N	LT TRN	NONE	77	17	M		SH/LP															150208800	1500CH5PW2Z
1	112.75	4286	CH5LX7P	12/11/2016	SUN	6		NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	0.4	21			JACKSON AVE			0		ANGL	ON	I	R STH	ND	SNOW	SNOW			H	PD			0	0	2	CAR	SVR	E	GO STR	NONE	25	41	F		SH/LP	343.05 3 A		TRK UT	SVR	N	SL/ST	SS	25	58	M		SH/LP	346.57 3		161204962	1600CH5LX7P
1	112.75	4286	CH5P4VM	10/10/2015	SAT	15		NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	0.4	21	E MAIN ST		JACKSON AVE			0	OBNFX	NO	ON	I	R STH	ND		CLR				PD			0	0	1	CAR	MOD	E	GO STR	NONE	25	58	F		SH/LP															151003739	1500CH5P4VM
1	112.84	4286	CH5P4VC	4/14/2015	TUE	14		NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	0.49		VAN BUREN AVE	21	E MAIN ST			0		HEAD	ON	I	R CITY	ND		CLDY			H	PD			0	0	2	TRK UT	NONE	N	BACKNG	SS	25	16	M		SH/LP			CAR	MOD	N	GO STR	SS	25	18	F		SH/LP			150402326	1500CH5P4VC
1	112.84	4286	CH5LX6H	11/5/2014	WED	11		NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	0.49	21	E MAIN ST		VAN BUREN AVE			0		REAR	ON	I	R STH	ND		CLR			H	PD			0	0	2	TRK SA	UNKN	E	GO STR	NONE	25	60	M		UNKN	346.14 2 A	346.70 1	CAR	MOD	E	GO STR	NONE	25	20	M		SH/LP			141101342	1400CH5LX6H
1	112.92	4286	CH54V12	2/6/2014	THU	10		NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	0.57	21	E MAIN ST		MAPLEWOOD RD			0		SSOP	ON	I	R STH	ND		CLR		C		PD			0	0	2	TRK UT	MOD	W	NEGCRV	NONE	25	76	M		SH/LP			CAR	MOD	E	NEGCRV	NONE	25	50	M		SH/LP	346.05 1		140200732	1400CH54V12
1	112.97	4286	CH54V10	1/10/2014	FRI	22		NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	0.62	21	E MAIN ST			720		0	OTHFX	NO	ON	N	R STH	ND	ICE	SLET	LIGT	C		PD			0	0	1	PLOW	NONE	E	NEGCRV	NONE	25	20	M		SH/LP															140115820	1400CH54V10
1	112.97	4286	CH56BF5	8/30/2014	SAT	16		NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	0.62	21	E MAIN ST		MAPLEWOOD RD	720	S	3		REAR	ON	N	R STH	ND	WET	CLDY				INJ	B	Y	0	1	2	CAR	SVR	W	LT TRN	NONE	25	43	M	B	NONE	347.48 2m b		TRK UT	V MNR	W	GO STR	NONE	25	36	M		SH/LP	343.44 1 a	346.14 1	140806992	1400CH56BF5
1	113.04	4286	CH5LX7C	6/5/2016	SUN	16		NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	0.69	21	MAIN ST		OMREAU AVE	805	W	3	UTPOLE	NO	SHLD	N	R STH	ND		CLDY				PD			0	0	1	TRK UT	V MNR	W	GO STR	NONE	25	56	M		SH/LP															160600457	1600CH5LX7C
1	113.1	4286	2NL01VRP3S	11/25/2017	SAT	16	EB driver fell asleep and drifted south hitting vehicle at McKinley	NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	0.75	21			MCKINLEY AVE			0		ANGL	ON	I	R STH	ND		CLR	DUSK			INJ	B		0	1	2	TRK SA	SVR	E	GO STR	NONE	25	37	M		SH/LP	346.57(2)	346.89(1)	TRK UT	MOD	N	STOPED	SS	25	51	M	B	SH/LP	343.05(3)(a)		171113314	
1	113.1	4286	CH54V15	3/11/2014	TUE	10	WB rear end of left turn onto McKinley	NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	0.75	21	E MAIN ST		MCKINLEY AVE			0		REAR	ON	I	R STH	ND		CLDY				PD			0	0	2	CAR	V MNR	W	LT TRN	NONE	25	55	M		SH/LP			CAR	MOD	W	GO STR	NONE	25	37	F		SH/LP			140302333	1400CH54V15
1	113.1	4286	CH5LX6R	5/23/2015	SAT	9	WB rear end of left turn onto McKinley	NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	0.75	21	E MAIN ST		MCKINLEY AVE		E	1		REAR	ON	I	R STH	ND		CLR				PD			0	0	2	CAR	MOD	W	LT TRN	NONE	25	28	M		SH/LP			CAR	MOD	W	GO STR	NONE	25	24	F		SH/LP	346.14 1		150505740	1500CH5LX6R
1	113.11	4286	CJF1W3T	7/16/2016	SAT	20	WB rear end of left turn onto McKinley	NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	0.76	21	E MAIN ST		MCKINLEY AVE		E	1		REAR	ON	I	R STH	ND		CLR				INJ	C		0	1	2	CYCLE	SVR	W	GO STR	NONE	25	27	M	C	EYE			CAR	MNR	W	SL/ST	NONE	25	42	M		SH/LP			160703560	1600CJF1W3T
1	113.16	4286	CH5L5ZR	6/28/2014	SAT	21	Imparied driver hit pedestrian crossing sign	NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	0.81	21	E MAIN ST		BECKWITH AVE			0	OBNFX	NO	ON	I	R STH	ND		CLR	LIGT			PD			0	0	1	CAR	V MNR	E	GO STR	NONE	25	48	M		UNKN	346.63 1 a	346.69													140607420	1400CH5L5ZR
1	113.17	4286	2NL01PTJN9	12/18/2018	TUE	16	WB rear end of vehicle yielding for pedestrian crossing	NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	0.82	21			BECKWITH AVE			0		REAR	ON	N	R STH	ND		CLR	LIGT			INJ	B		0	2	2	TRK UT	MOD	W	STOPED	NONE	25	32	M	B	SH/LP			TRK UT	SVR	W	GO STR	NONE	25	23	F	C	SH/LP	346.89(1)		181208548	
1	113.17	4286	2NL01TJN0C	6/6/2018	WED	18	WB rear end of vehicle yielding for pedestrian crossing	NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	0.82	21			BECKWITH AVE		E	1		REAR	ON	N	R STH	ND		CLR				INJ	C		0	2	2	CAR	MOD	W	STOPED	WS FL	25	42	F	C	SH/LP			CAR	MOD	W	GO STR	WS FL	25	39	M	C	SH/LP	346.14(1m)		180601190	
1	113.18	4286	CH5L5ZW	8/8/2014	FRI	14	WB rear end of vehicle yielding for pedestrian crossing	NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	0.83	21	E MAIN ST		BECKWITH AVE	915	E	2		REAR	ON	N	R STH	ND		CLR				PD			0	0	2	CAR	SVR	W	GO STR	NONE	25	16	F		SH/LP			CAR	MNR	W	STOPED	NONE	25	41	M		SH/LP			140802357	1400CH5L5ZW
1	113.22	4286	CH5PW2S	1/27/2015	TUE	9		NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	0.87		LINCOLN AVE	21	E MAIN ST	123		0	TFSIGN	NO	SHLD	I	R CITY	ND	SNOW	CLDY				PD			0	0	1	CAR	MNR	S	GO STR	NONE	25	70	F		SH/LP															150109593	1500CH5PW2S
1	113.22	4286	CH5LX71	11/26/2015	THU	4		NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	0.87	21	E MAIN ST		LINCOLN AVE			0		REAR	ON	I	R STH	ND	WET	CLDY	LIGT			PD			0	0	2	TRK UT	MOD	W	GO STR	NONE	30	45	M		SHLD			TRK UT	SVR	W	GO STR	NONE	35	19	F		UNKN	346.69	346.89 1	151109698	1500CH5LX71
1	113.27	4286	CH56BFF	7/1/2015	WED	15		NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	0.92	21	E MAIN ST		LINCOLN AVE		E	5		REAR	ON	N	R STH	ND		CLDY				INJ	B	Y	0	2	3	TRK UT	V MNR	W	GO STR	NONE	25	31	M		SH/LP			CAR	SVR	W	GO STR	NONE	25	20	M	B	SH/LP			150700299	1500CH56BFF
1	113.41	4286	CH56BFG	10/9/2015	FRI	16		NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	1.06	21	E MAIN ST		MOBILE HOME CT			0		REAR	ON	I	R STH	ND		CLR				PD			0	0	2	CAR	MOD	E	STOPED	NONE	35	29	F		SH/LP			CAR	MOD	E	OVT RT	NONE	35	24	M		SH/LP			151003074	1500CH56BFG
1	113.45	4287	CH56BF1	3/28/2014	FRI	17		NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	1.1	21	E MAIN ST		INDUSTRIAL DR			0		REAR	ON	I	R STH	ND		CLR				INJ	B		0	2	2	CAR	MOD	W	GO STR	NONE	35	63	M	B	SH/LP			CAR	SVR	W	GO STR	NONE	35	56	M		SH/LP	346.89 1	346.63 2 A 1	140307517	1400CH56BF1
1	113.47	4287	CH5PW3P	11/11/2015	WED	13		NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	1.12	21	E MAIN ST		INDUSTRIAL DR		E	1		REAR	ON	N	R STH	ND		CLDY				INJ	C		0	1	2	CAR	MNR	W	SL/ST	NONE	35	67	M	C	SH/LP			CAR	MNR	W	GO STR	NONE	35	80	F		SH/LP	346.14 1		151103105	1500CH5PW3P
1	113.67	4287	2NL01VRP3Z	2/24/2018	SAT	13	EB rear end of left turning vehicle onto Goldenrod	NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	1.32	21			GOLDENROD DR		W	0		REAR	ON	I	R STH	ND		CLDY				PD			0	0	2	CAR	MNR	E	GO STR	NONE	35	29	M		SH/LP			CAR	SVR	E	GO STR	NONE	35	18	M		SH/LP			180209170	
1	113.68	4287	CH56BF2	5/22/2014	THU	15	NB fail to yield to EB	NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	1.33	21	E MAIN ST		ALDER AVE		N	1		ANGL	ON	I	R STH	ND		CLR				PD			0	0	2	CAR	MOD	E	GO STR	NONE	35	19	F		SH/LP			TRK UT	MOD	N	LT TRN	SS	25	59	F		SH/LP	344.62 2	346.18 2	140504598	1400CH56BF2
1	113.68	4287	CH5L5ZM	6/7/2014	SAT	9	NB fail to yield to WB	NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	1.33	21	E MAIN ST		ALDER AVE			0		ANGL	ON	I	R STH	ND		CLR				INJ	C		0	2	2	CAR	MOD	W	GO STR	NONE	45	50	F	C	SH/LP			TRK UT	MOD	N	GO STR	SS	25	16	M		SH/LP			140611038	1400CH5L5ZM
1	113.68	4287	CH5P4V7	12/29/2014	MON	14	NB fail to yield to EB	NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	1.33	21			ALDER AVE			0		ANGL	ON	I	R STH	ND		CLR				INJ	B		0	3	2	CAR	SVR	N	LT TRN	SS	25	23	F	B	SH/LP	346.18 2	344.62 1	CAR	SVR	E	GO STR	NONE	35	40	F	B	SH/LP			141208242	1400CH5P4V7
1	113.68	4287	CH56BF9	2/24/2015	TUE	5	SB fail to yield to EB, foot slipped off brake, Neither driver valid driver license	NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	1.33	21	E MAIN ST		GOLDENROD DR			0		ANGL	ON	I	R STH	ND		CLR				INJ	B		0	1	2	TRK UT	SVR	E	GO STR	NONE	35	43	M		SH/LP	343.05 3 A	344.62 1	CAR	SVR	S	GO STR	SS	25	33	M		SH/LP	343.05 3 a	346.18 3	150208797	1500CH56BF9
1	113.68	4287	CH5PW3H	8/15/2015	SAT	17	EB rear end of left turning vehicle onto Goldenrod	NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	1.33	21	E MAIN ST		GOLDENROD DR		W	1		REAR	ON	I	R STH	ND		CLR				PD			0	0	2	CAR	SVR	E	GO STR	NONE	35	16	F		SH/LP			CAR	MOD	E	LT TRN	NONE	35	27	F		SH/LP			150803141	1500CH5PW3H
1	113.68	4287	CH5P4VZ	12/23/2015	WED	23	WB rear end of left turning vehicle onto Alder Ave	NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	1.33	21	E MAIN ST		ALDER AVE			0		REAR	ON	I	R STH	ND	WET	RAIN	DARK			PD			0	0	2	TRK ST	NONE	W	STOPED	NONE	35	39	M		SH/LP			CAR	MOD	W	GO STR	NONE	35	28	M		NONE	346.89 1	347.48 2M B	151206419	1500CH5P4VZ
1	113.68	4287	2NL01VRP3L	7/2/2017	SUN	14	NB fail to yield to EB	NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	1.33	21			GOLDENROD DR			0		ANGL	ON	I	R STH	ND		CLR				INJ	A	Y	0	3	2	CAR	SVR	N	GO STR	SS	25	63	M	B	SH/LP			CAR	SVR	E	GO STR	NONE	35	22	F	B	SH/LP			170700079	
1	113.68	4287	2NL01TJN08	12/30/2017	SAT	14	NB left fail to yield to SB through	NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	1.33		ALDER AVE	21			S	1		ANGL	ON	I	R CITY	ND		CLR				PD			0	0	2	CAR	MOD	S	GO STR	SS	35	44	F		SH/LP			TRK UT	MOD	N	LT TRN	SS	35	72	M		SH/LP			171212581	
1	113.68	4287	2NL01TJN0R	12/31/2018	MON	13	Rear end backing	NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	1.33	21			GOLDENROD DR			0		ANGL	ON	I	R STH	ND	WET	CLDY				PD			0	0	2	TRK UT	MOD	W	RT TRN	SS	35	28	M		SH/LP			TRK UT	MOD	W	GO STR	NONE	35	29	F		SH/LP			181210601	
1	113.93	4287	CH5L600	9/14/2014	SUN	11		NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	1.58	21	E MAIN ST		SCHWAB AVE			0	OT ANML	NO	ON	I	R STH	ND		CLR				PD			0	0	1	CAR	MNR	E	GO STR	NONE	45	73	F		SH/LP															140902524	1400CH5L600
1	113.93	4287	CH5PW3C	7/20/2015	MON	11		NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	1.58	21	E MAIN ST		SCHWAB AVE	1938	W	3		REAR	ON	N	R STH	ND		CLR				PD			0	0	3	TRK SA	NONE	W	GO STR	NONE	35	56	M		SH/LP	346.89 1		TRK UT	MNR	W	STOPED	NONE	35	32	M		SH/LP			150704407	1500CH5PW3C
1	113.94	4287	CJ37SXV	3/28/2014	FRI	17		NE	70	WINNEBAGO	7051	OMRO	C	21	E	162T	1.59	21	E MAIN ST		BROOKE DR		E	1	TFSIGN	NO	RTSH	N	R STH	ND		CLR				PD			0	0	1	CAR	MNR	E	OTHR	NONE	55	56	M		SH/LP															140307521	1400CJ37SXV
1	114.17	4287	CH5PW3S	3/1/2016	TUE	7		NE	70	WINNEBAGO	7008	OMRO	T	21	E	162T	1.82	21	E MAIN ST		SCHWAB AVE	2224	E	24	DITCH	NO	ON	N	R STH	ND	SNOW	SNOW		C		PD			0	0	1	CAR	MNR	E	GO STR	NONE	55	23	F		SH/LP															160300025	1600CH5PW3S
1	114.19	4287	CJCQMCZ	6/23/2015	TUE	15		NE	70	WINNEBAGO	7008	OMRO	T	21	E	162T	1.84	21	E MAIN ST		SCHWAB AVE		E	26		SSOP	ON	N	R STH	ND		CLR		C		PD			0	0	2	CAR	MOD	W	GO STR	NONE	55	18	F		SH/LP			CAR	MOD	E	GO STR	NONE	55	37	F		SH/LP			150606612	1500CJCQMCZ
1	114.31	4287	CJFCHZS	6/17/2016	FRI	16		NE	70	WINNEBAGO	7008	OMRO	T	21	E	162T	1.96	21	EB		RIVERMOOR RD		W	20		REAR	ON	N	R STH	ND		CLR				PD			0	0	2	CAR	SVR	E	SL/ST	NONE	55	19	M		SH/LP			CAR	MOD	E	SL/ST	NONE	55	20	F		SH/LP	346.14 1		160604462	1600CJFCHZS
1	114.51	4288	CJF43QV	11/27/2015	FRI	17	NB fail to yield to WB	NE	70	WINNEBAGO	7008	OMRO	T	21	E	166	0		RIVERMOOR RD	21				0		ANGL	ON	I	R TOWN	ND		CLDY	DARK	C		PD			0	0	2	CAR	MOD	W	GO STR	NONE	55	60	M		SH/LP			TRK UT	MNR	N	GO STR	SS	45	17	M		SH/LP	346.18 3		151109716	1500CJF43QV
1	114.51	4288	CJ2WG0F	2/16/2014	SUN	19	SB left turn fail to yield and EB took evasive action and went in ditch	NE	70	WINNEBAGO	7008	OMRO	T	21	E	166	0	21			RIVERMOOR RD		E	0	OTH NC	NO	RTSH	I	R STH	ND		CLDY	DARK			PD			0	0	2	TRK UT	NONE	E	LT TRN	SS	55	41	M		SH/LP	346.18 3		CAR	MNR	E	GO STR	NONE	55	29	M		SH/LP			140204239	1400CJ2WG0F
1	114.51	4288	2PL0TKW13J	9/19/2018	WED	15	SB fail to yield to WB	NE	70	WINNEBAGO	7008	OMRO	T	21	E	166	0	21			RIVERMOOR RD (2)		E	0		ANGL	ON	I	R STH	ND	WET	CLDY				INJ	B		0	2	3	CAR	SVR	S	LT TRN	SS	55	75	M	C	SH/LP	346.32		CAR	SVR	W	GO STR	NONE	55	75	M	B	SH/LP			180905824	
1	114.55	4288	2PL0RC7178	12/11/2017	MON	16	EB mechanical issue lost control	NE	70	WINNEBAGO	7008	OMRO	T	21	E	166	0.04	21			RIVERMOOR RD (2)		E	4	DITCH	NO	RTSH	N	R STH	ND		CLR	DARK			PD			0	0	1	CAR	MOD	W	GO STR	NONE	55	31	F		SH/LP	346.57(2)														171202699	
1	114.69	4288	CJFF0HQ	12/17/2016	SAT	10		NE	70	WINNEBAGO	7008	OMRO	T	21	E	166	0.18	21			RIVERMOOR RD		E	18	UTPOLE	NO	ON	N	R STH	ND	SNOW	SNOW		C		PD			0	0	1	CAR	MOD	E	NEGCRV	NONE	55	45	F		SH/LP															161206633	1600CJFF0HQ
1	114.71	4288	CJDG3ST	3/10/2015	TUE	18		NE	70	WINNEBAGO	7008	OMRO	T	21	E	166	0.2	21			RIVERMOOR RD		E	20	OT ANML	NO	ON	N	R STH	ND		CLR				PD			0	0	1	CAR	MNR	W	GO STR	NONE	55	56	F		SH/LP															150301854	1500CJDG3ST
1	114.74	4288	CJF5L6G	1/8/2016	FRI	15		NE	70	WINNEBAGO	7008	OMRO	T	21	E	166	0.23	21			RIVERMOOR RD		E	23		REAR	ON	N	R STH	ND	WET	RAIN				INJ	C		0	1	2	CAR	SVR	E	STOPED	NONE	55	16	M		SH/LP			TRK UT	SVR	E	GO STR	NONE	55	16	M		SH/LP	346.57 2		160101648	1600CJF5L6G
1	114.83	4288	CH54V11	1/25/2014	SAT	11		NE	70	WINNEBAGO	7008	OMRO	T	21	E	166	0.32	21			E SCOTT ST		W	22	DITCH	NO	ON	N	R STH	ND	ICE	CLR				PD			0	0	1	TRK UT	MOD	E	GO STR	NONE	55	39	F		SH/LP															140111925	1400CH54V11
1	114.91	4288	CJ3MNFC	5/4/2014	SUN	18		NE	70	WINNEBAGO	7008	OMRO	T	21	E	166	0.4	21			RIVERMOOR RD		E	40		REAR	ON	N	R STH	ND		CLR				INJ	B		0	1	2	CYCLE	V MNR	E	SL/ST	NONE	55	47	F		EYE			CYCLE	MOD	E	GO STR	NONE	55	41	M	B	EYE	346.63 1 A	346.63 1 B	140501172	1400CJ3MNFC
1	114.97	4288	CJD01JX	1/12/2015	MON	11		NE	70	WINNEBAGO	7008	OMRO	T	21	E	166	0.46	21			SCOTT ST		W	8		REAR	ON	N	R STH	ND		CLR				PD			0	0	2	TRK UT	V MNR	W	GO STR	NONE	55	78	M		SH/LP	346.89 1		CAR	SVR	W	SL/ST	NONE	55	29	F		SH/LP			150104063	1500CJD01JX
1	114.98	4288	CJD01J8	10/13/2014	MON	21		NE	70	WINNEBAGO	7008	OMRO	T	21	E	166	0.47	21			E SCOTT ST		W	7		REAR	ON	N	R STH	ND	WET	RAIN	DARK			PD			0	0	2	CAR	SVR	E	GO STR	NONE	55	38	M		SH/LP			CAR	UNKN	E	GO STR	NONE	55	0	N		UNKN			141005555	1400CJD01J8
1	115.06	4288	2PL0QJJ91P	5/31/2018	THU	16		NE	70	WINNEBAGO	7008	OMRO	T	21	E	167	0.01	21			E SCOTT ST		E	1		REAR	ON	I	R STH	ND		CLR				INJ	B		0	2	3	TRK ST	SVR	W	GO STR	NONE	55	45	M	B	SH/LP	346.89(1)		CAR	SVR	W	SL/ST	NONE	55	39	F	B	SH/LP			180511081	
1	115.09	4288	2PL0RMV8W0	1/30/2017	MON	16		NE	70	WINNEBAGO	7008	OMRO	T	21	E	167	0.04	21			E SCOTT ST	5916	E	4	MAILBOX	NO	RTSH	N	R STH	ND	SNOW	CLDY				PD			0	0	1	CAR	SVR	W	BLNK	NONE	55	51	F		SH/LP															170109350	
1	115.45	4288	2PL0SZCGFL	9/17/2018	MON	11		NE	70	WINNEBAGO	7008	OMRO	T	21	E	167	0.4	21			E SCOTT ST		E	40	DITCH	NO	BLNK	N	R STH	ND		CLR				INJ	B		0	1	1	CAR	SVR	W	GO STR	NONE	55	59	F	B	SH/LP	346.05(1)														180904729	
1	115.47	4288	2NL01PTJN7	11/7/2018	WED	7		NE	70	WINNEBAGO	7008	OMRO	T	21	E	167	0.42	21			E SCOTT ST		E	42		REAR	ON	N	R STH	ND		CLDY		C		INJ	B		0	4	2	CAR	SVR	W	SL/ST	NONE	55	31	F	B	SH/LP			CAR	SVR	W	GO STR	NONE	55	61	M	C	SH/LP	346.14(1m)		181102700	
1	115.48	4288	CJFCHZH	5/15/2016	SUN	7		NE	70	WINNEBAGO	7008	OMRO	T	21	E	167	0.43	21			REIGHMOOR RD		W	60		REAR	ON	N	R STH	ND		CLDY		C		INJ	B		0	2	2	CAR	MOD	W	GO STR	NONE	55	52	M	B	SH/LP			CAR	MOD	W	GO STR	NONE	55	20	M		SH/LP	346.63 1 A	346.63 1 B	160502957	1600CJFCHZH
1	115.84	4288	CJCXK61	10/24/2015	SAT	19		NE	70	WINNEBAGO	7008	OMRO	T	21	E	167	0.79	21	EB	FF	UTICA RD		W	24	OBNFX	NO	ON	N	R STH	ND		CLR	DARK			PD			0	0	1	CAR	MOD	E	GO STR	NONE	55	62	F		SH/LP															151006702	1500CJCXK61
1	115.88	4288	CJ3JPJN	1/24/2014	FRI	18		NE	70	WINNEBAGO	7008	OMRO	T	21	E	167	0.83	21			REIGHMOOR RD		W	20	OTH NC	NO	LTSH	N	R STH	ND	SNOW	SNOW	DARK	C		PD			0	0	1	TRK UT	NONE	W	NEGCRV	NONE	55	54	M		SH/LP	346.57 2														140108374	1400CJ3JPJN
1	115.92	4288	2PL0RZQKSP	6/19/2018	TUE	15		NE	70	WINNEBAGO	7008	OMRO	T	21	E	167	0.87	21		FF	UTICA RD		W	16	DITCH	NO	ON	N	R STH	ND		CLR		C		PD			0	0	1	CAR	SVR	E	NEGCRV	NONE	55	56	M		SH/LP	343.44(1)(b)	346.57(2)													180606309	
1	115.99	4288	CJFCJ0G	8/8/2016	MON	16		NE	70	WINNEBAGO	7008	OMRO	T	21	E	167	0.94	21	EB	FF	UTICA RD		W	9	DITCH	NO	LTSH	N	R STH	ND		CLR				INJ	C		0	1	1	CAR	SVR	E	SL/ST	NONE	55	20	F	C	SH/LP	346.57 2														160801274	1600CJFCJ0G
1	115.99	4288	CJDQ8CD	12/20/2016	TUE	10		NE	70	WINNEBAGO	7008	OMRO	T	21	E	167	0.94	21	WB	FF			W	9	OVRTRN	NO	RTSH	N	R STH	ND	SNOW	WIND				INJ	C		0	1	1	TRK UT	V SVR	W	GO STR	NONE	55	64	M	C	SH/LP															161208492	1600CJDQ8CD
1	116.07	4288	CJ37SZ0	4/8/2014	TUE	13	EB rear end turning left onto Reighmoor	NE	70	WINNEBAGO	7008	OMRO	T	21	E	167	1.02	21			REIGHMOOR RD		W	1		SSS	ON	I	R STH	ND		CLR				PD			0	0	2	CAR	MNR	E	STOPED	NONE	55	38	M		SH/LP	344.62 2		TRK SA	V MNR	E	OVT RT	NONE	55	53	M		SH/LP	346.57 2		140401174	1400CJ37SZ0
1	116.08	4289	2PL0QJJ928	7/3/2018	TUE	17	EB rear end turning left onto Reighmoor	NE	70	WINNEBAGO	7008	OMRO	T	21	E	168	0	21		FF	REIGHMOOR RD		W	0		REAR	ON	I	R STH	ND		CLR				INJ	C	Y	0	3	2	CAR	SVR	E	GO STR	NONE	55	50	M	C	SH/LP	346.89(1)		CAR	MOD	E	STOPED	NONE	55	54	F	C	SH/LP			180700444	
1	116.08	4289	CJ3NDMN	3/24/2014	MON	22	WB lost control on snowy pavement and hit EB	NE	70	WINNEBAGO	7008	OMRO	T	21	E	168	0	21			REIGHMOOR RD		E	0		HEAD	ON	I	R STH	ND	SNOW	SNOW				INJ	B	Y	0	1	2	CAR	V SVR	W	GO STR	NONE	55	22	M		SH/LP			CAR	V SVR	E	GO STR	NONE	55	53	F	B	SH/LP			140306238	1400CJ3NDMN
1	116.08	4289	CJDLK2P	3/10/2015	TUE	7	EB side swipe left turning vehicle onto Reighmoor	NE	70	WINNEBAGO	7008	OMRO	T	21	E	168	0	21		FF				0		REAR	ON	I	R STH	ND	WET	FOG				INJ	B		0	2	3	CAR	SVR	E	LT TRN	NONE	55	46	F	B	SH/LP			TRK UT	SVR	E	GO STR	NONE	55	62	M	B	SH/LP	346.14 1		150301855	1500CJDLK2P
1	116.08	4289	2PL0RXHJS6	7/3/2018	TUE	10	NB left fail to yield to SB through	NE	70	WINNEBAGO	7008	OMRO	T	21	E	168	0	21		FF	UTICA RD			0		ANGL	ON	I	R STH	ND		CLR				INJ	C		0	2	2	CAR	MOD	N	LT TRN	SS	45	69	F	C	SH/LP			CAR	MOD	S	GO STR	SS	55	59	F	C	SH/LP			180700447	
1	116.08	4289	2PL0QH97V2	6/24/2018	SUN	9	EB left fail to yield to WB	NE	70	WINNEBAGO	7008	OMRO	T	21	E	168	0	21			REIGHMOOR RD			0		REAR	ON	I	R STH	ND		CLR				FAT	K	Y	1	3	3	CAR	SVR	E	GO STR	NONE	55	42	F	B	SH/LP			CAR	SVR	E	STOPED	NONE	55	73	F	B	SH/LP			180608423	
1	116.08	4289	CJDT75Q	9/2/2016	FRI	6	EB rear end turning left onto Reighmoor	NE	70	WINNEBAGO	7008	OMRO	T	21	E	168	0	21	WB	FF	REIGHMOOR RD			0		REAR	ON	I	R STH	ND		CLR				INJ	B		0	2	2	CAR	SVR	W	GO STR	NONE	55	24	M	B	SH/LP			CAR	SVR	W	STOPED	NONE	55	30	F	C	SH/LP			160900345	1600CJDT75Q
1	116.08	4289	CJDBDND	8/14/2016	SUN	11	WB left fail to yield to EB	NE	70	WINNEBAGO	7008	OMRO	T	21	E	168	0	21	WB	FF				0		ANGL	ON	I	R STH	ND		CLR				INJ	C		0	1	3	TRK UT	MOD	W	LT TRN	NONE	55	37	M		SH/LP	346.18 2		CAR	SVR	E	GO STR	NONE	55	69	F	C	SH/LP			160802798	1600CJDBDND
1	116.08	4289	CJFFQPH	10/13/2016	THU	14	SB fail to yield to WB	NE	70	WINNEBAGO	7008	OMRO	T	21	E	168	0	21	WB		REIGHMOOR RD			0		ANGL	ON	I	R STH	ND		CLR				INJ	B		0	3	2	CAR	SVR	S	GO STR	SS	45	88	F	B	SH/LP			TRK UT	MOD	W	GO STR	NONE	55	65	F	C	SH/LP			161003149	1600CJFFQPH
1	116.08	4289	2PL0RFP3KB	7/12/2018	THU	7	NB backing hit vehicle behind them	NE	70	WINNEBAGO	7008	OMRO	T	21	E	168	0	FF	UTICA RD	21			S	1		REAR	ON	I	R CTH	ND		CLDY				PD			0	0	2	CAR	MOD	S	BACKNG	NONE	55	46	F		SH/LP			TRK SA	NONE	S	BACKNG	SS	55	54	M		SH/LP			180702993	
1	116.1	4289	CJCXK5C	7/2/2015	THU	4	WB fell asleep and drifted right just east of intersection	NE	70	WINNEBAGO	7008	OMRO	T	21	E	168	0.02	21		FF			E	2	DITCH	NO	ON	N	R STH	ND		CLR	DARK			INJ	C	Y	0	1	1	CAR	V SVR	W	GO STR	NONE	55	18	M	C	SH/LP															150700301	1500CJCXK5C
1	116.34	4289	2PL0RC718M	4/17/2018	TUE	13	EB ice fell off and hit WB	NE	70	WINNEBAGO	7008	OMRO	T	21	E	168	0.26	21		FF	UTICA RD		E	26	OBNFX	NO	ON	N	R STH	ND		CLR				PD			0	0	1	CAR	MOD	E	GO STR	NONE	55	57	F		SH/LP															180405234	
1	116.54	4289	KRL0DRXHLP	2/28/2018	WED	12	WB rear end of left turn into driveway	NE	70	WINNEBAGO	7008	OMRO	T	21	E	168	0.46	21			POTRATZ HILL RD		W	10		REAR	ON	N	R STH	ND		CLDY				PD			0	0	2	CAR	SVR	W	GO STR	NONE	55	22	F		SH/LP			CAR	MNR	W	SL/ST	NONE	55	57	F		SH/LP			180210805	
1	116.61	4289	CJFCJ03	7/11/2016	MON	10	EB rear end of right turn into driveway, dropped lunch and was picking it up	NE	70	WINNEBAGO	7008	OMRO	T	21	E	168	0.53	21	EB		POTRATZ HILL RD		W	3		REAR	ON	N	R STH	ND		CLR				INJ	C	Y	0	2	2	CAR	SVR	E	GO STR	NONE	55	18	F	C	SH/LP	344.62 1		CAR	MOD	E	STOPED	NONE	55	43	F	C	SH/LP			160702336	1600CJFCJ03
1	116.63	4289	CJ36BHC	1/16/2014	THU	9	EB lost control on snowy pavement	NE	70	WINNEBAGO	7008	OMRO	T	21	E	168	0.55	21			MARQUART LN	5343	W	1	MAILBOX	NO	RTSH	N	R STH	ND	SNOW	CLDY				PD			0	0	1	TRK UT	MOD	E	GO STR	NONE	55	81	M		SH/LP	346.57 2														140104539	1400CJ36BHC
1	116.64	4289	CJDG3WV	1/7/2016	THU	14	EB lost control on wet pavement	NE	70	WINNEBAGO	7008	OMRO	T	21	E	168	0.56	21			MARQUART LN			0	OTHFX	NO	RTSH	I	R STH	ND	WET	RAIN				PD			0	0	1	CAR	SVR	W	GO STR	NONE	55	50	F		SH/LP															160101122	1600CJDG3WV
1	116.64	4289	CJDRQNG	8/12/2015	WED	10	WB rear end turning left onto Potratz Hill Road	NE	70	WINNEBAGO	7008	OMRO	T	21	E	168	0.56	21			POTRATZ HILL RD			0		REAR	ON	I	R STH	ND		CLR			H	INJ	B	Y	0	2	2	CAR	SVR	W	GO STR	NONE	55	48	F	B	SH/LP	346.14 1	346.89 1	CAR	SVR	W	STOPED	NONE	55	26	F	B	SH/LP			150802396	1500CJDRQNG
1	116.9	4289	CJ30DX5	3/24/2014	MON	23	EB lost control on icy pavement	NE	70	WINNEBAGO	7008	OMRO	T	21	E	168	0.82	21			SAND PIT RD		W	20	DITCH	NO	SHLD	N	R STH	ND	ICE	CLDY	DARK			PD			0	0	1	CAR	SVR	W	GO STR	NONE	55	18	F		SH/LP															140306215	1400CJ30DX5
1	116.98	4289	CJDR0G5	2/26/2016	FRI	18	EB swerved left to miss object in roadway and lost control	NE	70	WINNEBAGO	7008	OMRO	T	21	E	168	0.9	21			SAND PIT RD		W	12	DITCH	NO	SHLD	N	R STH	ND		CLDY	DARK			INJ	C	Y	0	3	1	CAR	MOD	E	GO STR	NONE	55	32	F	C	SH/LP															160207828	1600CJDR0G5
1	117.05	4289	CJD01LG	9/20/2015	SUN	6	WB drifted left over centerline and EB	NE	70	WINNEBAGO	7008	OMRO	T	21	E	168	0.97	21			SAND PIT RD		W	5		HEAD	ON	N	R STH	ND		CLR	DAWN			INJ	A	Y	0	5	2	CAR	V SVR	W	GO STR	NONE	55	18	M	A	UNKN			CAR	V SVR	E	GO STR	NONE	55	43	F	A	SH/LP			150904676	1500CJD01LG
1	117.08	4289	2PL0QWMM0L	3/25/2018	SUN	6	WB swerved to miss a dog and lost control	NE	70	WINNEBAGO	7008	OMRO	T	21	E	168	1	21			SAND PIT RD		W	2	DITCH	NO	LTSH	N	R STH	ND		CLR	DARK			INJ	B		0	1	1	CAR	SVR	W	OTHR	NONE	55	19	M	B	SH/LP	343.44(1)(a)	346.70(2)													180306513	
1	117.09	4289	CJCQM9V	11/18/2014	TUE	16	WB left fail to yield to EB	NE	70	WINNEBAGO	7008	OMRO	T	21	E	168	1.01	21			SAND PIT RD		W	1		ANGL	ON	I	R STH	ND		CLDY	DUSK			INJ	B	Y	0	2	2	CAR	SVR	W	LT TRN	NONE	55	28	M	C	UNKN	346.18 2	346.05 1	CAR	SVR	W	GO STR	NONE	55	47	M	B	SH/LP			141107070	1400CJCQM9V
1	117.09	4289	CJDRQPP	12/19/2015	SAT	9	EB left overtaken on the left	NE	70	WINNEBAGO	7001	ALGOMA	T	21	E	168	1.01	21	EB		SANDPIT RD		W	1	DITCH	NO	LTSH	N	R STH	ND		CLR				INJ	C		0	1	2	TRK UT	MOD	E	OVT LT	NONE	55	52	M	C	SH/LP	341.04 1		CAR	NONE	E	LT TRN	NONE	55	62	M		SH/LP			151205294	1500CJDRQPP
1	117.1	4290	CJCW2P6	4/27/2015	MON	18	EB left fail to yield to WB	NE	70	WINNEBAGO	7008	OMRO	T	21	E	169	0	21			SAND PIT RD			0		ANGL	ON	I	R STH	ND		CLR				INJ	C		0	1	2	CAR	NONE	E	LT TRN	NONE	55	62	M		SH/LP	346.18 2		TRK UT	SVR	W	GO STR	NONE	55	28	M	C	NONE	347.48 2m b		150406037	1500CJCW2P6
1	117.1	4290	CJD3QN1	6/14/2015	SUN	17	WB left rear end by WB	NE	70	WINNEBAGO	7008	OMRO	T	21	E	169	0	21			SAND PIT RD			0		REAR	ON	I	R STH	ND		CLR				PD			0	0	2	TRK UT	MOD	E	SL/ST	NONE	55	31	M		SH/LP			CAR	MOD	E	GO STR	NONE	55	18	F		SH/LP	346.57 2		150604853	1500CJD3QN1
1	117.1	4290	CJDT74P	5/2/2016	MON	7	WB left rear end by WB	NE	70	WINNEBAGO	7008	OMRO	T	21	E	169	0	21			SAND PIT RD			0		REAR	ON	I	R STH	ND		CLR				INJ	B		0	2	2	TRK UT	SVR	W	GO STR	NONE	55	35	M	B	SH/LP	346.89 1		TRK UT	MOD	W	LT TRN	NONE	55	32	M	C	SH/LP			160500097	1600CJDT74P
1	117.1	4290	CJDN1KS	11/23/2015	MON	17	WB left rear end by WB	NE	70	WINNEBAGO	7008	OMRO	T	21	E	169	0		SAND PIT RD	21				0		REAR	ON	I	R TOWN	ND		CLR	DARK			PD			0	0	2	CAR	MNR	W	GO STR	NONE	55	22	F		SH/LP			CAR	MNR	W	STOPED	NONE	55	41	F		SH/LP			151109707	1500CJDN1KS
1	117.1	4290	2PL0QH97S7	8/25/2017	FRI	10	WB left rear end by WB	NE	70	WINNEBAGO	7008	OMRO	T	21	E	169	0	21			SAND PIT RD			0		REAR	ON	I	R STH	ND		CLR				INJ	B	Y	0	3	2	CAR	SVR	W	GO STR	NONE	55	61	F	B	SH/LP	346.89(1)		CAR	MNR	W	SL/ST	NONE	55	54	M	B	SH/LP			170807593	
1	117.1	4290	2PL0S9LVP3	12/18/2017	MON	17	EB left rear end by EB	NE	70	WINNEBAGO	7008	OMRO	T	21	E	169	0		SAND PIT RD	21			S	0		REAR	ON	I	R TOWN	ND		CLDY	DARK			INJ	B	Y	0	2	2	TRK UT	SVR	E	GO STR	NONE	55	19	M	B	SH/LP	346.14(1)		CAR	SVR	E	SL/ST	NONE	55	52	F	C	SH/LP			171206406	
1	117.1	4290	C3XC543	7/29/2014	TUE	13	NB fail to yield to EB	NE	70	WINNEBAGO	7008	OMRO	T	21	E	169	0	21			SAND PIT RD			0		ANGL	ON	I	R STH	ND		CLR				PD			0	0	2	TRK UT	SVR	N	GO STR	SS	55	74	M		SH/LP	346.18 3		TRK UT	SVR	E	GO STR	NONE	55	19	M		SH/LP			140708759	1400C3XC543
1	117.1	4290	CJ37SZN	7/20/2014	SUN	15	WB left rear end by WB	NE	70	WINNEBAGO	7008	OMRO	T	21	E	169	0	21			SAND PIT RD		E	0		REAR	ON	I	R STH	ND		CLR				INJ	B	Y	0	3	2	CAR	V SVR	W	GO STR	NONE	55	21	F	B	SH/LP	344.62 1	346.89 1	CAR	SVR	W	LT TRN	NONE	55	88	F	B	SH/LP			140705092	1400CJ37SZN
1	117.1	4290	CJF99B0	5/31/2016	TUE	11	WB left rear end by WB	NE	70	WINNEBAGO	7008	OMRO	T	21	E	169	0	21			SAND PIT RD			0		REAR	ON	I	R STH	ND		CLDY				INJ	C		0	1	2	CAR	NONE	S	LT TRN	NONE	45	45	F	C	SH/LP			CAR	MOD	W	GO STR	NONE	55	18	M		SH/LP			160508727	1600CJF99B0
1	117.12	4290	2PL0RLM7VM	4/18/2018	WED	7	EB rear end stopping for school bus ahead reaching for wallet	NE	70	WINNEBAGO	7008	OMRO	T	21	E	169	0.02	21			SAND PIT		E	2		REAR	ON	N	R STH	ND		CLR				INJ	C		0	1	2	CAR	SVR	E	GO STR	NONE	55	31	F	C	SH/LP			TRK UT	MOD	E	SL/ST	NONE	55	66	M		SH/LP			180405616	
1	117.14	4290	CJDT760	9/24/2016	SAT	10	EB driver passed out and lost control	NE	70	WINNEBAGO	7008	OMRO	T	21	E	169	0.04	21	EB		SAND PIT RD		E	4	CULVRT	NO	LTSH	N	R STH	ND		CLDY				INJ	B		0	1	1	CAR	SVR	E	GO STR	NONE	55	38	F	B	SH/LP															160906779	1600CJDT760
1	117.26	4290	CJCZ9BJ	1/26/2015	MON	20	EB lost control on ice	NE	70	WINNEBAGO	7008	OMRO	T	21	E	169	0.16	21				4924		0	MAILBOX	NO	ON	N	R STH	ND	SNOW	SNOW	DARK			PD			0	0	1	CAR	MOD	E	GO STR	NONE	55	25	F		SH/LP															150109697	1500CJCZ9BJ
1	117.29	4290	CJD01KC	2/23/2015	MON	11	EB rear end slowing for traffic	NE	70	WINNEBAGO	7008	OMRO	T	21	E	169	0.19	21			SANDPIT RD		E	19		REAR	ON	N	R STH	ND		CLR				INJ	B		0	1	2	TRK UT	MNR	W	GO STR	NONE	55	62	M		SH/LP			CAR	MNR	W	SL/ST	NONE	55	58	F	B	SH/LP			150207183	1500CJD01KC
1	117.31	4290	CJDR0FF	12/14/2015	MON	16	EB left into driveway rear ended	NE	70	WINNEBAGO	7008	OMRO	T	21	E	169	0.21	21			SAND PIT RD	4950	E	20		REAR	ON	N	R STH	ND	WET	RAIN	DARK			INJ	B	Y	0	3	4	TRK UT	V SVR	E	GO STR	NONE	55	35	M	B	SH/LP	343.44 1 A	346.89 1	CAR	V SVR	W	GO STR	NONE	55	35	F	B	SH/LP	343.44 1 B	347.413 1	151203474	1500CJDR0FF
1	117.33	4290	2PL0RC718W	4/29/2018	SUN	15	WB lost control mechanical failure	NE	70	WINNEBAGO	7008	OMRO	T	21	E	169	0.23	21			SAND PIT RD		E	23		HEAD	ON	N	R STH	ND		CLR				INJ	C		0	2	3	TRK UT	SVR	E	GO STR	NONE	55	46	F		SH/LP			CAR	SVR	W	GO STR	NONE	55	50	M	C	SH/LP	346.57(2)		180409637	
1	117.35	4290	CJ3PW3G	9/7/2014	SUN	8	WB fell asleep and drifted left across centerline	NE	70	WINNEBAGO	7001	ALGOMA	T	21	E	169	0.25	21			SAND PIT RD		E	25		HEAD	SHLD	N	R STH	ND		CLR				PD			0	0	2	CAR	MOD	W	GO STR	NONE	55	20	M		SH/LP	346.05 1	346.89 1	TRK UT	MNR	E	GO STR	NONE	55	58	F		SH/LP			140900768	1400CJ3PW3G
1	117.36	4290	2PL0S3FP4F	10/14/2017	SAT	10	EB drifted left of center and hit WB	NE	70	WINNEBAGO	7008	OMRO	T	21	E	169	0.26	21			SAND PIT RD		E	25		SSOP	ON	N	R STH	ND		CLDY				PD			0	0	2	CAR	MOD	E	OTHR	NONE	55	67	F		SH/LP	346.34(1)(a)3		TRK SA	MNR	W	GO STR	NONE	55	44	M		SH/LP			171006360	
1	117.37	4290	2PL0QH97RC	1/4/2017	WED	11	WB drifted left of center and hit EB	NE	70	WINNEBAGO	7008	OMRO	T	21	E	169	0.27	21			SAND PIT RD		E	27		NO	ON	N	R STH	ND		CLR				FAT	K		1	0	2	CAR	SVR	E	BLNK	NONE	55	30	M	K	SH/LP			TRK SA	SVR	E	BLNK	NONE	55	56	M		SH/LP			170100463	
1	117.49	4290	CJFFQNZ	8/12/2016	FRI	14	EB hit object in road	NE	70	WINNEBAGO	7008	OMRO	T	21	E	169	0.39	21	EB		SAND PIT RD		E	39	OBNFX	NO	ON	N	R STH	ND		CLDY				INJ	B	Y	0	1	2	CYCLE	SVR	E	GO STR	NONE	55	61	M	B	HT/EY			TRK UT	NONE	W	GO STR	NONE	55	52	F		SH/LP	348.10 2		160802807	1600CJFFQNZ
1	117.5	4290	CJCVBDS	10/16/2014	THU	13	WB rear end slowing for traffic	NE	70	WINNEBAGO	7001	ALGOMA	T	21	E	169	0.4	21			SAND PIT RD		E	40		REAR	ON	N	R STH	ND		CLDY				PD			0	0	3	CAR	MOD	W	GO STR	NONE	55	19	F		SH/LP	346.14 1		TRK UT	MNR	W	GO STR	NONE	55	18	F		SH/LP	346.57 2		141003976	1400CJCVBDS
1	117.52	4290	2PL0RC713L	1/11/2017	WED	18	EB left turn into driveway overtaken on left	NE	70	WINNEBAGO	7008	OMRO	T	21	E	169	0.42	21			SAND PIT RD	4200	E	42		ANGL	ON	N	R STH	ND	SNOW	SNOW	DARK			PD			0	0	2	CAR	MOD	E	BLNK	NONE	55	40	F		SH/LP			CAR	MOD	E	BLNK	NONE	55	48	F		SH/LP			170102097	
1	117.56	4290	2PL0RB000P	8/16/2017	WED	11	EB hit object in road	NE	70	WINNEBAGO	7008	OMRO	T	21	E	169	0.46	21			SAND PIT RD		E	46	OBNFX	NO	ON	N	R STH	ND		CLR				PD			0	0	1	CAR	MOD	E	GO STR	NONE	55	63	M		SH/LP															170804594	
1	117.69	4290	2PL0RFP3JC	4/4/2018	WED	8	WB lost control passing with snowy pavement	NE	70	WINNEBAGO	7001	ALGOMA	T	21	E	169	0.59	21			SAND PIT RD		E	59	TREE	NO	BLNK	N	R STH	ND	SNOW	CLR				INJ	B	Y	0	1	1	TRK UT	SVR	W	OVT LT	NONE	55	57	M	B	SH/LP															180401591	
1	117.73	4290	CJCPW66	6/9/2015	WED	16	EB lost control overtaking right turning vehicle	NE	70	WINNEBAGO	7001	ALGOMA	T	21	E	169	0.63	21			SAND PIT RD	4266	E	61		HEAD	ON	N	R STH	ND		CLR				INJ	B		0	1	2	CAR	SVR	E	OVT RT	NONE	55	25	M	B	SH/LP	346.57 2		CAR	MOD	W	GO STR	NONE	55	45	M		SH/LP			150901375	1500CJCPW66
1	117.73	4290	2PL0RXHJNX	10/10/2017	TUE	12	EB rear end adjusting radio	NE	70	WINNEBAGO	7001	ALGOMA	T	21	E	169	0.63	21			SAND PIT RD		E	63		REAR	ON	N	R STH	ND		CLDY				PD			0	0	2	CAR	MNR	E	SL/ST	NONE	55	38	F		SH/LP	346.89(1)		CAR	MNR	E	SL/ST	NONE	55	40	F		SH/LP			171002388	
1	117.85	4290	CJF1W2X	3/1/2016	TUE	4	WB lost control on snowy pavement	NE	70	WINNEBAGO	7001	ALGOMA	T	21	E	169	0.75	21			SAND PIT RD		E	75	DITCH	NO	LTSH	N	R STH	ND	SNOW	SNOW	DARK			PD			0	0	1	CAR	SVR	W	GO STR	NONE	55	35	M		SH/LP	343.05 3 A														160301045	1600CJF1W2X
1	118.01	4290	2PL0RMV8ZW	5/7/2018	MON	23	EB lost control swerving for racoon	NE	70	WINNEBAGO	7001	ALGOMA	T	21	E	169	0.91	21			OMRO RD		W	61	DITCH	NO	SHLD	N	R STH	ND		CLR	DARK			PD			0	0	1	CAR	SVR	E	GO STR	NONE	55	46	F		SH/LP	343.44(1)(b)	344.62(1)													180504129	
1	118.08	4290	2PL0QCL4H3	10/23/2017	MON	15	WB rear ended waiting to turn left into driveway	NE	70	WINNEBAGO	7001	ALGOMA	T	21	E	169	0.98	21			LEONARD PT. RD			0		REAR	ON	N	R STH	ND		CLDY				INJ	C		0	1	3	TRK UT	SVR	W	GO STR	NONE	55	35	M	C	SH/LP	346.89(1)		CAR	SVR	W	SL/ST	NONE	55	37	M		SH/LP			171008031	
1	118.09	4290	CJ39RDJ	5/1/2014	THU	5	EB hit object in road	NE	70	WINNEBAGO	7001	ALGOMA	T	21	E	169	0.99	21			LEONARD POINT RD		W	50	OBNFX	NO	ON	N	R STH	ND	WET	CLDY	DAWN			PD			0	0	1	CAR	V MNR	E	GO STR	NONE	55	48	M		SH/LP															140500914	1400CJ39RDJ
1	118.21	4290	CJDT75D	6/22/2016	WED	10	WB turning left into driveway rear ended	NE	70	WINNEBAGO	7001	ALGOMA	T	21	E	169	1.11	21			LEONARD POINT RD		W	38		REAR	ON	N	R STH	ND		CLR				INJ	B		0	2	2	CAR	SVR	W	GO STR	NONE	55	83	F	B	SH/LP			TRK UT	MOD	W	SL/ST	NONE	55	49	M	C	SH/LP			160606468	1600CJDT75D
1	118.27	4290	CJD5GV9	6/14/2015	SUN	12	EB turning left into driveway rear ended	NE	70	WINNEBAGO	7001	ALGOMA	T	21	E	169	1.17	21			HONEY CREEK RD		W	106		REAR	ON	N	R STH	ND		CLDY				INJ	B		0	1	2	CAR	MOD	E	GO STR	NONE	55	54	M		SH/LP	346.14 1		CAR	MOD	E	GO STR	NONE	55	50	F	B	SH/LP			150603007	1500CJD5GV9
1	118.32	4290	CJD4GVB	10/29/2014	WED	17	EB rear end of slowing traffic ahead	NE	70	WINNEBAGO	7001	ALGOMA	T	21	E	169	1.22	21			LEONARD POINT RD		W	51		REAR	ON	N	R STH	ND		CLDY				PD			0	0	2	CAR	MNR	E	SL/ST	NONE	55	17	M		SH/LP			CAR	MOD	E	SL/ST	NONE	55	27	M		SH/LP	346.14 1		141008756	1400CJD4GVB
1	118.36	4290	2PL0RFP3JH	8/26/2018	MON	12	WB turning left into driveway rear ended	NE	70	WINNEBAGO	7001	ALGOMA	T	21	E	169	1.26	21			OMRO RD		W	23		REAR	ON	N	R STH	ND		CLR				INJ	C		0	2	2	CAR	SVR	W	GO STR	NONE	55	17	M	C	SH/LP	346.89(1)		CAR	MOD	W	LT TRN	NONE	55	59	M	C	SH/LP			180807081	
1	118.38	4290	2PL0QDT5LD	8/13/2017	SUN	17	EB drifted left of center and hit WB	NE	70	WINNEBAGO	7001	ALGOMA	T	21	E	169	1.28	21		21			W	1		SSOP	ON	N	R STH	ND		CLR		C		PD			0	0	4	CAR	SVR	E	NEGCRV	NONE	55	20	F		SH/LP	346.05(1)		CAR	NONE	W	NEGCRV	NONE	55	40	F		SH/LP			170802808	
1	118.39	4290	CJ30DX6	3/25/2014	TUE	1	WB lost control on icy pavement	NE	70	WINNEBAGO	7001	ALGOMA	T	21	E	169	1.29	21			LEONARD POINT RD		W	20	DITCH	NO	SHLD	N	R STH	ND	ICE	CLDY	DARK	C		PD			0	0	1	CAR	MOD	W	GO STR	NONE	55	21	F		SH/LP															140306216	1400CJ30DX6
1	118.39	4290	CJCVBFZ	1/13/2015	TUE	11	WB in EB lanes and hit EB vehicle	NE	70	WINNEBAGO	7001	ALGOMA	T	21	E	169	1.29	21			HONEY CREEK RD		W	95		HEAD	ON	N	R STH	ND		CLR				INJ	B	Y	0	2	2	CAR	SVR	W	GO STR	NONE	55	74	F	B	SH/LP			TRK SA	SVR	E	GO STR	NONE	55	58	M	B	SH/LP			150105968	1500CJCVBFZ
1	118.42	4290	CJFH72P	6/24/2016	FRI	16	WB side swipe in same direction	NE	70	WINNEBAGO	7001	ALGOMA	T	21	E	169	1.32	21			HONEY CREEK RD		W	80		SSS	ON	N	R STH	ND		CLR				PD			0	0	2	CAR	MOD	W	MERGNG	WS	55	22	F		SH/LP	346.32		CAR	MOD	W	GO STR	WS	55	67	M		SH/LP			160607101	1600CJFH72P

Segment KAB Crash Rate Flag
Segment KAB & Total Crash Rate Flag
Intersection Total Crash Rate Flag
Intersection KAB Crash Rate Flag
Intersection KAB & Total Crash Rate Flag
Bike Flag
Pedestrian Flag

- XX - No Engineering Countermeasure

ATTACHMENT D

Contributing Geometric Analysis Documentation

Safety Certification Worksheet

Safety Certification Worksheet

Analyst: Nelson, Scott A
Agency: WisDOT DTSD NE Region
Date of Analysis: 2020-04-08
Meta Manager Version: 2019-10
Meta Manager Crash Years: 2014-2018

Design ID: 6180-30-00
Highway: WIS 21 EB
Project Title: OMRO - OSHKOSH
Project Description: STH 116 - LEONARD POINT ROAD
Worksheet ID: 2716

System Screening - Sites of Promise							Crash Vetting - Sites of Promise	Contributing Geometric Analysis	
See FDM 11-38-10.2 for guidance							See FDM 11-38-10.3 for guidance	See FDM 11-38-10.4 for guidance	
Segments: Meta-Manager									
PDP ID	**From RP**	**RP Description**	**To RP**	**Length** (PDP_Mile)	**Crash Rate Flag** (RATEFLAG) (Insert value if ≥ 1.0)	**KAB Crash Rate Flag** (MMGR_KAB_CRSH_RT) (Insert value if ≥ 1.00)	**Summarize the contributing factors for ALL crashes in the flagged segment.**	**Which geometric features contribute to the type and severity of the crashes?**	**Possible Countermeasures for Safety Mitigation Process**
4284	021E162T000	STH 116 WB	021E162T006	0.06	2.1088	2.0873	5 of 10 crashes remain after vetting. All five crashes are intersection specific. Four WB rear ends of left turning traffic. No left turn lane exists. One NB fail to yield to WB with visibility obstructed by a parked vehicle at the Jefferson intersection.	WB rear end crashes were impacted by having no left turn lane to turn south on STH 116/Jefferson St. or driveways. These four crashes resulted in one type B suspected minor injury, one type C possible injury and two property damage only crashes. The right angle failure to yield crash had no geometric features influencing the crash. The crash resulted in a property damage only crash.	Developing a left turn lane on STH 21 WB at Jefferson or TWLTL could help address the two rear end crashes. This was determined to not be a feasible alternative.
4285	021E162T006	WEBSTER AVE	021E162T017	0.11					
4286	021E162T017	MADISON AVE	021E162T110	0.93					
4287	021E162T110	INDUSTRIAL DR	021E166 000	1.06					
4288	021E166 000	RIVERMOOR RD	021E168 000	1.57					
4289	021E168 000	CTH FF	021E169 000	1.02		1.4584	12 of the 22 crashes remain after vetting. Eight of the 12 crashes remaining crashes occurred at CTH FF intersection and are described in the intersections section below. Of the four remaining crashes in this segment, one occurred at Potratz Hill where WB vehicle was rear ended, one drifted left of centerline, and the remaining two were at Sand Pit Road.	For the ten crashes at CTH FF and Sand Pit Road, see the intersections section below. Of the two remaining crashes one drifted left of center and one was a WB rear end crash at Potratz Hill. These two crashes resulted in one type A suspected serious injury and one type B suspected minor injury.	Recommendations at CTH FF & Sand Pit are listed in the inersections section below. Given only one crash at Potratz Hill, no safety mitigation recommended at this intersection. The project is expected to include centerline rumble strips to address the crash that drifted left of center.
4290	021E169 000	SAND PIT RD	021E170K000	1.35	1.1763	1.7913	14 of 37 crashes remain after vetting. Nine of the remaining crashes occurred at the inersection of Sand Pit Road and the details are discussed in the intersections section below. The five remaining crashes all involve vehicles that drifted left of centerline.	For the nine crashes at Sand Pit Road, see the intersections section below. For the five drifting left of center crashes, no geometric features seem to influence these crashes other than no centerline rumble strips are present. These five crashes resulted in one fatal crash, one suspected minor injury, and three property damage only crashes.	Recommendations at CTH FF & Sand Pit are listed in the inersections section below. Centerline rumble stripes are expected to be included in the project to address these left of center crashes.
Intersections: Intersection Network Screening									
INT_ID	**Intersection Name** (IX_NAME)		**LOSS** (TOTAL)	**PSI** (TOTAL)	**LOSS** (KABC)	**PSI** (KABC)	**Summarize the contributing factors for ALL crashes in the flagged intersection.**	**Which geometric features contribute to the type and severity of the crashes?**	**Possible Countermeasures for Safety Mitigation Process**

IX_70_02975	STH 21 & STH 116	LOSS 4	3.97	LOSS 4	0.84	5 of 8 crashes remain after vetting. Four WB rear ends of left turning traffic. No left turn lane exists. One NB fail to yield to WB with visibility obstructed by a parked vehicle.	WB rear end crashes were impacted by having no left turn lane to turn south on STH 116/Jefferson St. or driveways. These four crashes resulted in one type B suspected minor injury, one type C possible injury and two property damage only crashes. The right angle failure to yield crash had no geometric features influencing the crash. The crash resulted in a property damage only crash.	Developing a left turn lane on STH 21 WB at Jefferson or TWLTL could help address the two rear end crashes. This was determined to not be a feasible alternative.
IX_70_02976	STH 21 & Webster Ave S	LOSS 3	1.07	LOSS 2	-0.39			
IX_70_02977	STH 21 & Madison Ave	LOSS 4	2.39	LOSS 3	0.02	1 of 7 crashes remain after vetting. A WB vehicle yielded to a pedestrian crossing North to South on the East side of the inersection. Another WB tried bypassing WB on right and struck the pedestrian.	Mainly a driver error by passing vehicle resulting in type B suspected minor injury. The width of the crossing is long with two travel lanes and two parking lanes.	Narrowing the STH 21 or creating bump-outs at the Madison Street intersection may have reduced the likehood of this collision. This was determined to not be a feasible alternative.
IX_70_02978	STH 21 & Monroe St	LOSS 3	0.62	LOSS 4	0.45	3 of 4 crashes remain after vetting. Two WB rear ends of left turns onto Monroe and one WB rear end turing into Kwik Trip.	WB rear end crashes were impacted by having no left turn lane to turn south on STH 116 to Monroe St. or driveways. These three crashes resulted in one type B suspected minor injury, and two property damage only crashes.	Developing a left turn lane on STH 21 WB at Monroe or TWLTL could help address the two rear end crashes. This was determined to not be a feasible alternative.
IX_70_02980	STH 21 & Quincy Ave	LOSS 3	0.62	LOSS 4	1.16	1 of 3 crashes remain after vetting. A WB rear end of left turning traffic into a driveway near Quincy Ave.	WB rear end crash was impacted by having no left turn lane. The crash resulted in a type C possible injury.	Developing a left turn lane on STH 21 WB at Quincy Ave. or TWLTL could help address the two rear end crashes. This was determined to not be a feasible alternative.
IX_70_02981	STH 21 & Jackson Ave	LOSS 3	1.25	LOSS 3	0.10			
IX_70_02982	STH 21 & Van Buren Ave	LOSS 2	-0.65	LOSS 2	-0.25			
IX_70_02985	STH 21 & Harrison Ave & Maplewood Rd	LOSS 2	-2.68	LOSS 2	-0.79			
IX_70_03018	STH 21 & Maplewood Rd	LOSS 2	-0.65	LOSS 3	0.10			
IX_70_03027	STH 21 & Omreau Ave	LOSS 2	-0.65	LOSS 3	0.10			
IX_70_03026	STH 21 & McKinley Ave	LOSS 3	0.62	LOSS 4	0.45	3 of 4 crashes remain after vetting. Three WB rear end crashes with left turns onto McKinley Ave.	The three WB rear end crashes were impacted by having no left turn lanes. The three crashes resulted in on type C possible injury and two property damage only crashes.	Developing a left turn lane on STH 21 at McKinley Ave. or TWLTL could help address the three rear end crashes. This was determined to not be a feasible alternative.
IX_70_03024	STH 21 & Beckwith Ave	LOSS 3	0.62	LOSS 4	0.45	0 of 4 crashes remain after vetting.	None	None
IX_70_03023	STH 21 & Lincoln Ave	LOSS 2	-0.65	LOSS 2	-0.25			
IX_70_03028	STH 21 & Goldenrod Ave	LOSS 2	-1.43	LOSS 2	-0.31			
IX_70_03030	STH 21 & Industrial Dr	LOSS 2	-1.12	LOSS 3	0.43			
IX_70_03034	STH 21 & Alder Ave & Goldenrod Dr	LOSS 4	4.27	LOSS 4	1.43	3 of ten crashes remain after vetting. Two EB rear end crashes while turning onto Goldenrod and on WB rear end crash while turning onto Alder Ave.	The three rear end crashes of left turning vehicles were impacted by having no left turn lanes. The three crashes resulted in property damage only.	Developing a left turn lane on STH 21 EB & WB at Alder/Goldenrod or TWLTL could help address the three rear end crashes. This was determined to not be a feasible alternative.
IX_70_03043	STH 21 & Brooke Dr & Schwab Ave	LOSS 3	0.10	LOSS 2	-0.79			
IX_70_02902	STH 21 & Rivermoor Rd (2)	LOSS 4	2.84	LOSS 3	0.06	0 of 4 crashes remain after vetting.	None	None
IX_70_02757	STH 21 & E Scott St	LOSS 3	0.38	LOSS 3	0.14			
IX_70_02649	STH 21 & CTH FF & Reighmoor Rd	LOSS 4	3.21	LOSS 4	3.76	9 of the 11 crashes remain after vetting. Six of the 9 involved left turning crashes from Hwy 21. One NB left failed to yield to a SB motorist. One SB failed to yield to WB. The remaining crash was not intersection related but the driver drifted off the roadway to the right.	The mainline left turning crashes are impacted by having no left turn lanes. NB failing to yield ot SB due to looking at crossing traffic. SB and WB crash due to picking an inadequate gap. The drift to the right due to inattentive driving. The nine crases resulted in one fatality, three type B suspected minor injuries, four type C possible injuries, and one property damage only.	Safety mitigation for these crashes could inlcude a roundabout, left turn lanes on STH 21 EB & WB, and longitudinal shoulder rumble strips.
IX_70_02655	STH 21 & Marquart Ln & Potratz Hill Rd	LOSS 3	0.24	LOSS 3	0.48			
IX_70_02660	STH 21 & Sand Pit Rd	LOSS 4	9.04	LOSS 4	4.10	11 of 11 crashes remain after vetting. Ten of the 11 crashes involve a left turning vehicle from Highway 21. The remaining crash was a NB failure to yield to an EB.	The mainline left turning crashes are impacted by having no left turn lanes. NB failing to yield to EB due to picking an inadequate gap. These crashes resulted in five type B suspected minor injuries, three type C possible injuries, and three property damage only crashes.	Safety mitigation for these crashes could inlcude a roundabout, left turn lanes on STH 21 EB & WB, and longitudinal shoulder rumble strips.

ATTACHMENT E

Safety Mitigation Certification Documentation

Layout/Schematic for each alternative
and Cost Estimate for each alternative

Created by: Mason Simmons

6/24/2020

STH 21 – STH 116 – Industrial Drive

Project ID: 6180-30-00
Title : Omro - Oshkosh
Region : NORTHEAST
Route : STH 021
Sub Title: STH 116 – Leonard Point
County : Winnebago

Improvement Type proposed RSRF10

MetaManager 9/2019

Year 1 ADT varies 10,590

Year 20 ADT varies 10,590

HMA – would be 4MT58-28S based on FDM: 14-10 Attachment 10.3 WisDOT HMA Mixture Selection Process.

Existing roadway conditions:

- 25 MPH roadway
- 12-ft thru lanes with 9-ft parking lanes or 6-ft urban shoulders

Proposed TWLTL conditions:

- 25 MPH roadway
- 12-ft through lanes
- 16-ft TWLTL
- 6-ft Bike Lanes

The options presented were to compare an overlay of STH 21 to adding a TWLTL, however a TWLTL will not fit in the current roadway area. Widening the road to accommodate this option would require a massive real estate acquisition of downtown Omro. As such, no alternative will be presented for this section of roadway.

Project ID: 6180-30-00
STH 21
Omro – Oshkosh
STH 116 - Leonard Point Rd
Winnebago County

Created by: Mason Simmons
Created: 6/2/2020

STH 21 & CTH FF/Reighmoor Rd Intersection

The intersection of STH 21 and CTH FF has an intersection safety flag. Two alternatives have been suggested to mitigate the crashes occurring they are slotted left turn lanes on STH 21 and a single lane roundabout. A construction cost estimate including estimated real estate costs have been created for the two alternatives and a do-nothing alternative cost estimate.

Existing roadway conditions and assumptions for project:

- STH 21 is on the community's plan for wider shoulders for bike accommodations
- 1 ¼-Inch Base Aggregate Dense unit weight = 2 Tons/ CY
- ¾-Inch Base Aggregate Dense unit weight = 2.1 Tons/CY
- Fill expansion factor: 1.33
- STH 21 is a concrete roadway with no HMA overlay
    - As-built 6184-03-71
- Traffic forecasting:
    - Year 1 AADT: 11,090
    - Year 20 AADT: 11,090
- The proposed Improvement Type is RSRF10

*NOTE – if this Do nothing alternative. is selected for the preferred alternative the CTH FF work would most likely stop at the radius and not extend down the road. Due to the nature of IHSDM and this process all alternatives need to have the same limits. All design assumptions need to be revisited in final design.

Do Nothing Alternative (Option 1):

No Geometric modifications.

Limits on STH 21: 0+75 – STA 19+90. Mainline length 1915-ft.

Assumptions:

- 10% of the concrete will need to be repaired or replaced.
- 2-inch HMA of 4LT58-28S based on FDM: 14-10 Attachment 10.3 WisDOT HMA Mixture Selection Process**.**
- 5-ft shoulders (widen from 3-ft due to bike comp plan)
- No new BAD is needed for shoulders due to HMA widening. Using Shaping Shoulders to shape gravel section of shoulder. – Anticipated to be used project wide – therefore higher quantity for pices.

Limits on CTH FF: CTH FF from STA 22+58 – 32+44. Sideroad lengths: 1020-ft

Assumptions:

- 2-inch HMA of 4LT58-28S based on FDM: 14-10 Attachment 10.3 WisDOT HMA Mixture Selection Process**.**
- Mill 2-inches –It is assumed this would be the only milling on the project.
- No new BAD for shoulders

Estimated cost:

Item Number	Item Name	Unit	Quantity	Unit Price	Item Cost
305.0500	Shaping Shoulders	STA	18.8	$50.00	$940
416.1710	Concrete Pavement Repair	SY	315	$80.00	$25,200
416.1720	Concrete Pavement Replacement	SY	315	$90.00	$28,350
455.0605	Tack Coat	Gal	510	$5.00	$2,550
204.0120	Removing Asphaltic Surface Milling	SY	2,500	$6.00	$15,000
460.5224	HMA Pavement 4LT 58-28S	Tons	1,125	$70.00	$78,750
646.1020	Marking Line Epoxy 4-Inch	LF	2,775	$1.00	$2,775
646.1040	Marking Line Grooved Epoxy 4-inch	LF	3,750	$2.00	$7,500
				Total	$161,665
				Rounded	$170,000

Items that are not included in the estimate:

- Traffic control items
- Mobilization
- Field office
- Incentive Items

These items are not included because they are depended on the entire project. To speculate the percentage of these items for this specific location would be very challenging and most-likely not accurate.

Option 2 – Slotted Left Turn Lane

This option will add a slotted left turn lane with a 6-ft positive offset along STH 21. Based off traffic forecast, the left turn lane will be 300-ft. it will be assumed that the final pavement design along STH 21 will be 2inches of HMA over 9-inches of concrete over 6 inches of base aggregate with 5-ft shoulders. Outside of the intersection reconstruction limits, a 2-inch mill and overlay will be applied to CTH FF road between 22+58 – 32+44. It is assumed that all the concrete will be hand work on this project.

Limits on STH 21: 0+75 – STA 19+90. Mainline length 1915-ft.

Assumptions:

- 6-ft positive offset of left turn lanes
- 300-ft left turn lanes
- Pavement Structure: 2-inches HMA over 9-inches concrete over 6-inches of 1 ¼-Inch BAD
    - 2-inch HMA of 4LT58-28S based on FDM: 14-10 Attachment 10.3 WisDOT HMA Mixture Selection Process**.**
- 5-ft shoulders (widen from 3-ft due to bike comp plan) with 5-ft gravel shoulders

Limits on CTH FF: CTH FF from STA 22+58 – 32+44. Sideroad lengths: 1020-ft

Assumptions:

- 5-inch HMA of 4LT58-28S based on FDM: 14-10 Attachment 10.3 WisDOT HMA Mixture Selection Process**.**
- Mill 2-inches
- No new BAD for shoulders

Estimated cost:

Item Number	Item Name	Unit	Quantity	Unit Price	Item Cost
204.0100	Removing Pavement	SY	6,300	$20.00	$126,000
205.0100	Excavation Common	CY	5,000	$12.00	$120,000

208.0100	Borrow	CY	1200	$12.00	$14,400
305.0110	Base Aggregate Dense ¾-Inch	Tons	400	$22.00	$8,800
305.0120	Base Aggregate Dense 1 ¼ -Inch	Tons	3,125	$18.00	$56,250
415.0090	Concrete Pavement 9-Inch	SY	6,300	$55.00	$346,500
455.0605	Tack Coat	Gal	70	$5.00	$350
460.5224	HMA Pavement 4MT 48-28S	Ton	1,125	$70.00	$78,750
522.1018	Apron Endwalls for Culvert Pipe Reinforced Concrete 18-Inch	Each	2	$600	$1,200
601.0411	Concrete Curb & Gutter 30-Inch Type D	LF	800	$30.00	$24,000
602.0410	Concrete Sidewalk 5-Inch	SF	2,400	$10.00	$24,000
608.0318	Storm Sewer Culvert Pipe Reinforced Concrete Class III 18-Inch	LF	60	$100	$6,000
611.1004	Catch Basin 4-ft Diameter	Each	2	$2,000	$4,000
625.0500	Salvaged Topsoil	SY	400	$4.00	$1,600
628.2004	Erosion Mat Class I Type B	SY	400	$1.50	$600
629.0210	Fertilizer Type B	CWT	.1	$250.00	$25
630.0120	Seeding Mixture No. 20	LBS	10	$25.00	$250
646.1020	Marking Line Epoxy 4-Inch	LF	2,775	$1.00	$2,775
646.1040	Marking Line Grooved Epoxy 4-inch	LF	3,750	$2.00	$11,250
	FEE R/W (1 parcel)	Acres	.2	$50,000	$10,000
	TLE R/W (1 parcel)	Acres	.05	$10,000	$500
				Total	$823,000
				Rounded	$830,000

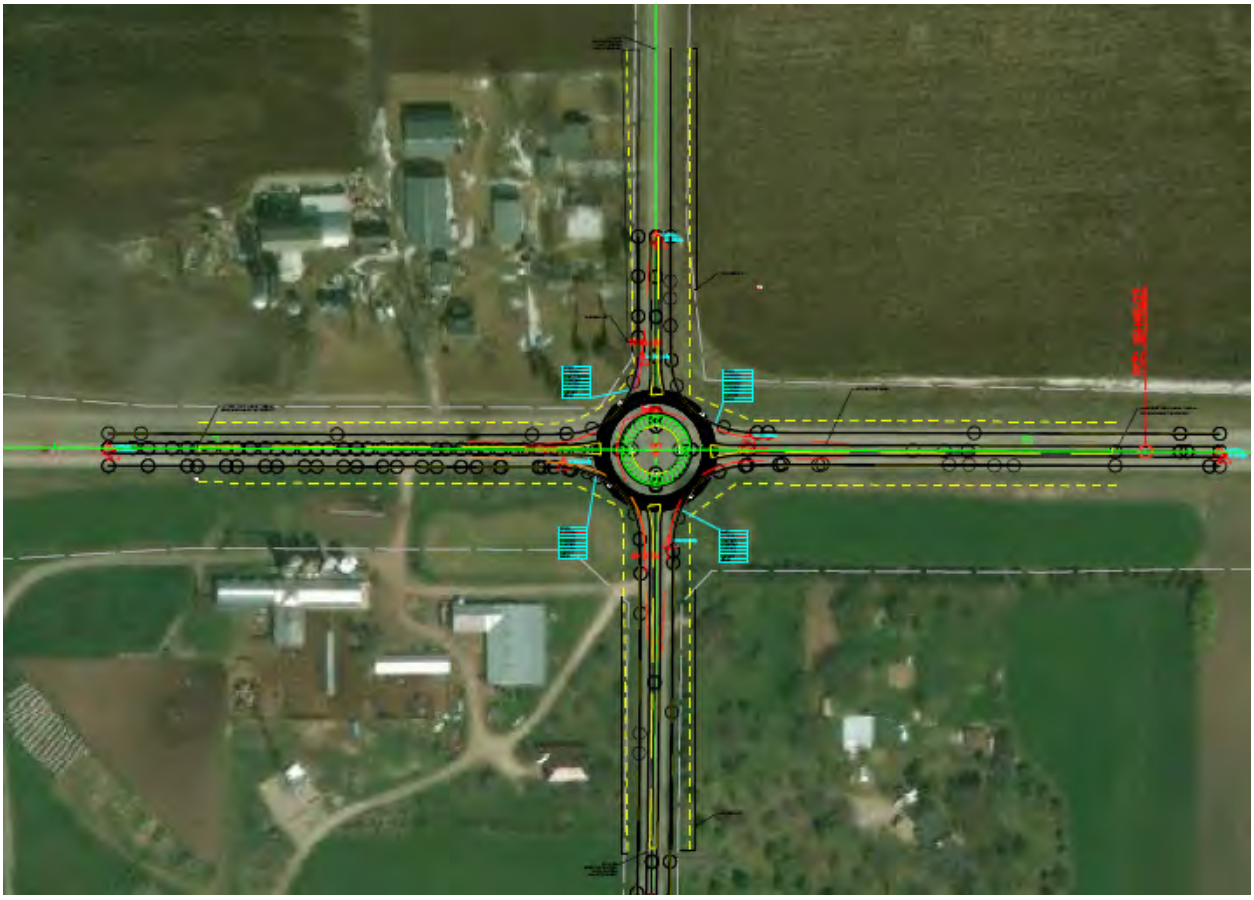
Items that are not included in the estimate:

- Traffic control items
- Mobilization
- Field office
- Incentive Items

These items are not included because they are depended on the entire project. To speculate the percentage of these items for this specific location would be very challenging and most-likely not accurate.

Option 3 – Single Lane Roundabout

This option will reconstruct the intersection to a single lane roundabout. In final design the exact configuration will be completed.



Limits on STH 21: 0+75 – STA 19+90. Mainline length 1915-ft.

Assumptions:

- STA 4+77 – 16+09 will be reconstructed
- STA 0+75 – STA 19+90 -2-inch HMA of 4LT58-28S based on FDM: 14-10 Attachment 10.3 WisDOT HMA Mixture Selection Process**.**
- 5-ft paved shoulders, 5 -ft Gravel at full thickness
- Did not provide grading for Multi-use path
- Lighting lump sum was created by: poles, arms, pull box, Transformer Base, Luminaire LED lights, and Lighting Control Cabinet

Limits on CTH FF: CTH FF from STA 22+58 – 32+44. Sideroad lengths: 1020-ft

Assumptions:

- STA 22+58 – 32+44 be reconstructed
- Depth of HMA, 4LT58-28S based off recent As-built

- 3-ft gravel Shoulders

Estimated Costs: See above for some comments. – How come HMA was brought down to 65, less quantity than project above – I would suggest staying at 70?

Item Number	Item Name	Unit	Quantity	Unit Price	Item Cost
205.0100	Excavation Common	CY	10,000	$12.00	$120,000
305.0110	Base Aggregate Dense ¾-Inch	Tons	400	$22.00	$8,800
305.0120	Base Aggregate Dense 1 ¼ -Inch	Tons	3,700	$18.00	$66,600
415.0090	Concrete Pavement 9-Inch	SY	4,500	$55.00	$247,500
416.0512	Concrete Truck Apron 12-Inch	SY	457	$60.00	27,420
460.5244	HMA Pavement 4LT 58-28S	Tons	750	$70.00	$52,500
522.1018	Apron Endwalls for Culvert Pipe Reinforced Concrete 18-Inch	Each	8	$600	$4,800
608.0318	Storm Sewer Culvert Pipe Reinforced Concrete Class III 18-Inch	LF	120	$100	$12,000
601.0411	Concrete Curb & Gutter 30-Inch Type D	LF	4,562	$30.00	$136,860
602.0410	Concrete Sidewalk 5-Inch (at splitter island crossings)	SF	11,721	$10.00	$117,210
611.1004	Catch Basin 4-ft Diameter	Each	8	$2,000	$16,000
625.0500	Salvaged Topsoil	SY	5,000	$4.00	$20,000
628.2004	Erosion Mat Class I Type B	SY	5,000	$1.50	$7,500
629.0210	Fertilizer Type B	CWT	.5	$250.00	$125
630.0120	Seeding Mixture No. 20	LBS	200	$25.00	$5,000
646.1020	Marking Line Epoxy 4-Inch	LF	2,775	$1.00	$2,775
646.1040	Marking Line Grooved Epoxy 4-inch	LF	3,750	$2.00	$7,500
SPV.0120.01	Lighting Slump Sum	LS	1	$65,000	$65,000
	FEE R/W (5 Parcels)	Acres	.5	$50,000	$25,000
				Total	$942,590
				Rounded	$950,000

Items that are not included in the estimate:

- Traffic control items
- Mobilization
- Field office
- Incentive Items

These items are not included because they are depended on the entire project. To speculate the percentage of these items for this specific location would be very challenging and most-likely not accurate.

Project ID: 6180-30-00
STH 21
Omro – Oshkosh
STH 116 - Leonard Point Rd
Winnebago County

Created by: Mason Simmons
Created: 5/20/2020

STH 21 & Sand Pit Rd Intersection

The intersection of STH 21 and Sand Pit Rd has an intersection safety flag. Two alternatives have been suggested to mitigate the crashes occurring they are slotted left turn lanes on STH 21 and a single lane roundabout. A construction cost estimate including estimated real estate costs have been created for the two alternatives and a do-nothing alternative cost estimate.

Existing roadway conditions and assumptions for project:

- STH 21 is on the community's plan for wider shoulders for bike accommodations
- 1 ¼-Inch Base Aggregate Dense unit weight = 2 Tons/ CY
- ¾-Inch Base Aggregate Dense unit weight = 2.1 Tons/CY
- Fill expansion factor: 1.33
- STH 21 is a concrete roadway with no HMA overlay
    - As-built 6184-03-71
- Traffic forecasting:
    - Year 1 AADT: 11,090
    - Year 20 AADT: 11,090
- The proposed Improvement Type is RSRF10

*NOTE – if this Do nothing alternative. is selected for the preferred alternative the CTH FF work would most likely stop at the radius and not extend down the road. Due to the nature of IHSDM and this process all alternatives need to have the same limits. All design assumptions need to be revisited in final design.

Do Nothing Alternative (Option 1):

No Geometric modifications.

Limits on STH 21: 54+32 – STA 73+11. Mainline length 1879-ft.

Assumptions:

- 10% of the concrete will need to be repaired or replaced.
- 2-inch HMA of 4LT58-28S based on FDM: 14-10 Attachment 10.3 WisDOT HMA Mixture Selection Process**.**
- 5-ft shoulders (widen from 3-ft due to bike comp plan)
- No new BAD is needed for shoulders due to HMA widening. Using Shaping Shoulders to shape gravel section of shoulder.

Limits on CTH FF: STA 0+00 – 10+20. Sideroad lengths: 1020-ft

Assumptions:

- 2-inch HMA of 4LT58-28S based on FDM: 14-10 Attachment 10.3 WisDOT HMA Mixture Selection Process**.**
- Mill 2-inches
- No new BAD for shoulders

Estimated cost:

Item Number	Item Name	Unit	Quantity	Unit Price	Item Cost
305.0500	Shaping Shoulders	STA	18.8	$50.00	$940
416.1710	Concrete Pavement Repair	SY	315	$80.00	$25,200
416.1720	Concrete Pavement Replacement	SY	315	$90.00	$28,350
455.0605	Tack Coat	Gal	510	$5.00	$2,550
204.0120	Removing Asphaltic Surface Milling	SY	2500	$6.00	$15,000
460.5224	HMA Pavement 4LT 58-28S	Tons	1,125	$70.00	$78,750
646.1020	Marking Line Epoxy 4-Inch	LF	2,775	$1.00	$2,775
646.1040	Marking Line Grooved Epoxy 4-inch	LF	3,750	$2.00	$7,500
				Total	$161,065
				Rounded	$170,000

Items that are not included in the estimate:

- Traffic control items
- Mobilization
- Field office
- Incentive Items

These items are not included because they are depended on the entire project. To speculate the percentage of these items for this specific location would be very challenging and most-likely not accurate.

Option 2 – Slotted Left Turn Lane

This option will add a slotted left turn lane with a 6-ft positive offset along STH 21. Based off traffic forecast, the left turn lane will be 300-ft. it will be assumed that the final pavement design along STH 21 will be 2inches of HMA over 9-inches of concrete over 6 inches of base aggregate with 5-ft shoulders. Outside of the intersection reconstruction limits, a 2-inch mill and overlay will be applied to CTH FF road between 0+00 – 10+20. It is assumed that all the concrete will be hand work on this project.

Limits on STH 21: 54+32 – STA 73+11. Mainline length 1879-ft.

Assumptions:

- 6-ft positive offset of left turn lanes
- 300-ft left turn lanes
- Pavement Structure: 2-inches HMA over 9-inches concrete over 6-inches of 1 ¼-Inch BAD
    - 2-inch HMA of 4LT58-28S based on FDM: 14-10 Attachment 10.3 WisDOT HMA Mixture Selection Process**.**
- 5-ft shoulders (widen from 3-ft due to bike comp plan) with 5-ft Gravel shoulders
- Limits on CTH FF: STA 0+00 – 10+20. Sideroad lengths: 1020-ft

Assumptions:

- 5-inch HMA of 4LT58-28S based on FDM: 14-10 Attachment 10.3 WisDOT HMA Mixture Selection Process**.**
- 2-inch over lay limits
- Mill 2-inches
- No new BAD for shoulders

Estimated cost:

Item Number	Item Name	Unit	Quantity	Unit Price	Item Cost
204.0100	Removing Pavement	SY	6,300	$20.00	$126,000
205.0100	Excavation Common	CY	500	$12.00	$6,000
208.0100	Borrow	CY	1200	$12.00	$14,400
305.0120	Base Aggregate Dense 1 ¼ - Inch	Tons	3,125	$18.00	$56,250
415.0090	Concrete Pavement 9-Inch	SY	6,300	$55.00	$346,500
455.0605	Tack Coat	Gal	70	$5.00	$350
460.5224	HMA Pavement 4MT 48-28S	Ton	1,125	$70.00	$78,750
522.1018	Apron Endwalls for Culvert Pipe Reinforced Concrete 18-Inch	Each	2	$600	$1,200
601.0411	Concrete Curb & Gutter 30-Inch Type D	LF	800	$30.00	$24,000
602.0410	Concrete Sidewalk 5-Inch (at splitter island crossings)	SF	2,400	$10.00	$24,000
608.0318	Storm Sewer Culvert Pipe Reinforced Concrete Class III 18-Inch	LF	60	$100	$6,000
611.1004	Catch Basin 4-ft Diameter	Each	2	$2,000	$4,000
625.0500	Salvaged Topsoil	SY	400	$4.00	$1,600
628.2004	Erosion Mat Class I Type B	SY	400	$1.50	$600
629.0210	Fertilizer Type B	CWT	.1	$250.00	$25
630.0120	Seeding Mixture No. 20	LBS	10	$25.00	$250
646.1020	Marking Line Epoxy 4-Inch	LF	2,775	$1.00	$2,775
646.1040	Marking Line Grooved Epoxy 4-inch	LF	3,750	$2.00	$7,500
	FEE R/W	Acres	.2	$50,000	$10,000
	TLE R/W	Acres	.05	$10,000	$500
				Total	$710,700
				Rounded	$720,000

Items that are not included in the estimate:

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- Mobilization
- Field office
- Incentive Items

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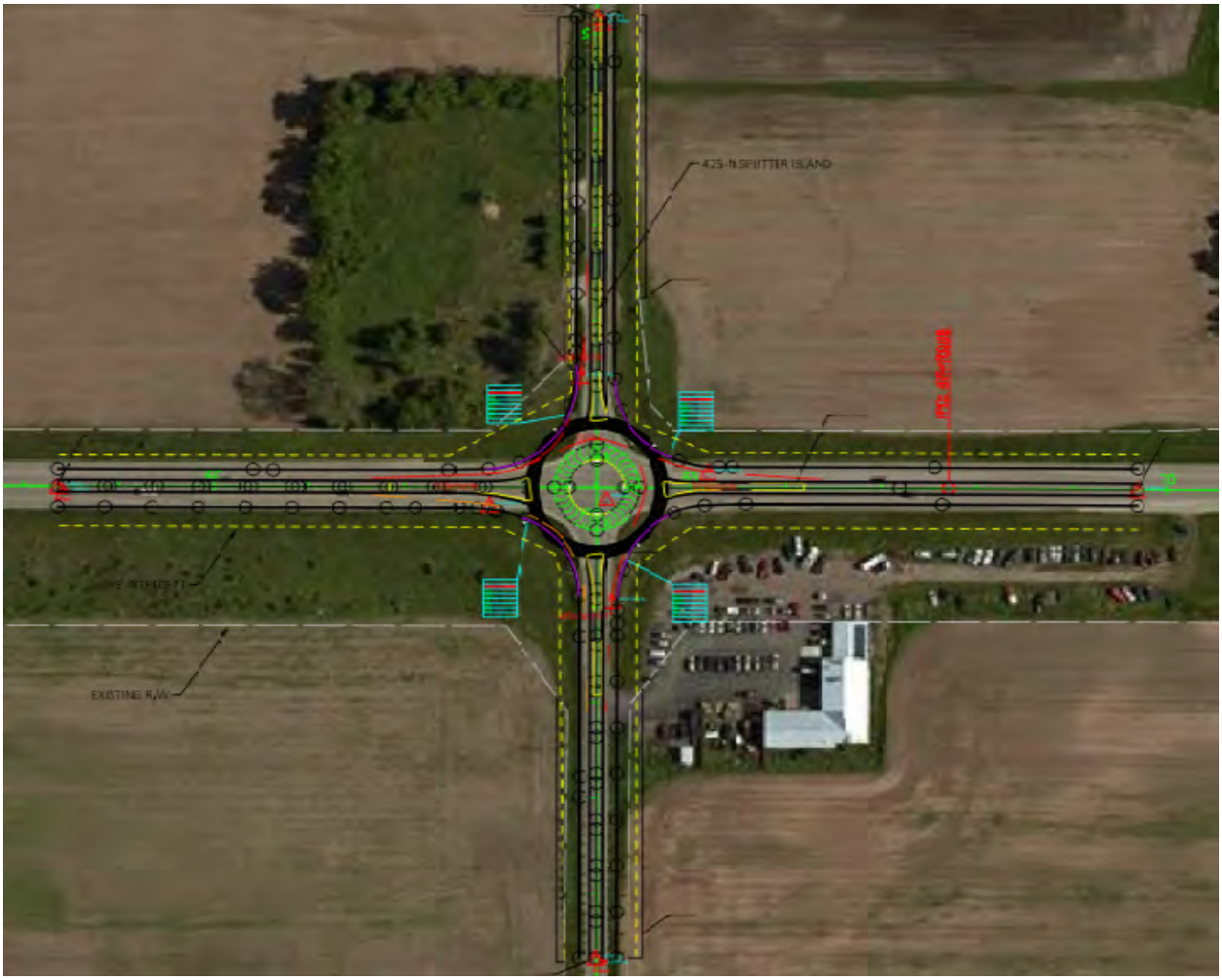
Option 3 – Single Lane Roundabout

This option will reconstruct the intersection to a single lane roundabout. In final design the exact configuration will be completed.



Limits on STH 21: 54+32 – STA 73+11. Mainline length 1879-ft. Assumptions:

- STA 58+32 – 69+68. will be reconstructed – based off previous As-built depths
- STA 54+32 – STA 73+11 -2-inch HMA of 4LT58-28S based on FDM: 14-10 Attachment 10.3 WisDOT HMA Mixture Selection Process**.**
- 5-ft paved shoulders, 5 -ft Gravel at full thickness
- Did not provide grading for Multi-use path
- Lighting lump sum was created by: poles, arms, pull box, Transformer Base, Luminaire LED lights, and Lighting Control Cabinet

Limits on CTH FF: STA 0+00 – 10+20. Sideroad lengths: 1020-ft Assumptions:

- STA 22+58 – 32+44 be reconstructed
- Depth of HMA, 4LT58-28S based on previous as-built
- 3-ft gravel shoulders

Item Number	Item Name	Unit	Quantity	Unit Price	Item Cost
205.0100	Excavation Common	CY	6,200	$12.00	$74,400
305.0110	Base Aggregate Dense ¾-Inch	Tons	400	$22.00	$8,800
305.0120	Base Aggregate Dense 1 ¼ -Inch	Tons	3,700	$18.00	$66,600
415.0090	Concrete Pavement 9-Inch	SY	4,500	$55.00	$247,500
416.0512	Concrete Truck Apron 12-Inch	SY	457	$60.00	27,420
460.5244	HMA Pavement 4LT 58-28S	Tons	750	$70.00	$52,500
522.1018	Apron Endwalls for Culvert Pipe Reinforced Concrete 18-Inch	Each	8	$600	$4,800
608.0318	Storm Sewer Culvert Pipe Reinforced Concrete Class III 18-Inch	LF	120	$100	$12,000
601.0411	Concrete Curb & Gutter 30-Inch Type D	LF	4,562	$30.00	$136,860
602.0410	Concrete Sidewalk 5-Inch	SF	11,721	$10.00	$117,210
611.1004	Catch Basin 4-ft Diameter	Each	8	$2,000	$16,000
625.0500	Salvaged Topsoil	SY	5,000	$4.00	$20,000
628.2004	Erosion Mat Class I Type B	SY	5,000	$1.50	$7,500
629.0210	Fertilizer Type B	CWT	.5	$250.00	$125
630.0120	Seeding Mixture No. 20	LBS	200	$25.00	$5,000
SPV.0120.01	Lighting Slump Sum	LS	1	$65,000	$65,000
	FEE R/W	Acres	.5	$50,000	$25,000
				Total	$886,715
				Rounded	$900,000

Items that are not included in the estimate:

- Traffic control items
- Mobilization
- Field office
- Incentive Items

These items are not included because they are depended on the entire project. To speculate the percentage of these items for this specific location would be very challenging and most-likely not accurate.

ATTACHMENT E

Safety Mitigation Certification Documentation

IHSDM Crash Prediction Evaluation Report
for each alternative

Interactive Highway Safety Design Model

Crash Prediction Evaluation Report

STH 21 & CTH FF
Overlay & Concrete Repair
Base Case

August 6, 2020

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Report Overview

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Evaluation Date: Thu Aug 06 09:00:20 CDT 2020
IHSDM Version: v15.0.0 (Oct 31, 2019)
Site Set Crash Prediction Module: v|ModuleInfo.moduleVersion| (|ModuleInfo.moduleDate|)

User Name: Scott Nelson
Organization Name: WisDOT NE Region
Phone: 920.366.2109
E-Mail: scott.nelson@dot.wi.gov

Project Title: 6180-30-00, STH 21 from STH 116 to Leonard Point
Project Comment: Created Wed Jul 01 13:40:49 CDT 2020
Project Unit System: U.S. Customary

Site Set: CTH FF Intersection Overlay & Concrete Repair
Site Set Comment: Created Wed Jul 01 13:41:29 CDT 2020
Site Set Version: v3

Evaluation Title: CTH FF Predicted Crashes Overlay & Concrete Repair
Evaluation Comment: Created Thu Aug 06 08:59:07 CDT 2020
Policy for Superelevation: AASHTO 2011 U.S. Customary
Calibration: WisDOT Calibration_v15-0
Crash Distribution: WisDOT Distributions_v15-0
Model/CMF: WisDOT Models_v15-0
Note: A Model Data Set other than the HSM (Highway Safety Manual) Configuration was selected for this Evaluation. If Crash Modification Factors (CMFs) were modified, then the results will not be in accordance with the HSM (see HSM Appendix to Part C, section A.1.3).
First Year of Analysis: 2027
Last Year of Analysis: 2036
Empirical-Bayes Analysis: None

Disclaimer Regarding Crash Prediction Method

IMPORTANT NOTICE ABOUT COMPARING RESULTS FROM HIGHWAY SAFETY MANUAL FIRST EDITION (2010) MODELS TO RESULTS FROM NEW MODELS DEVELOPED UNDER NCHRP PROJECTS 17-70 AND 17-58

Since the publication of the Highway Safety Manual - First Edition (HSM-1), in 2010 by the American Association of State

Highway and Transportation Officials (AASHTO), multiple research efforts have been undertaken through the National Cooperative Highway Research Program (NCHRP) to develop safety performance models for road segment and intersection facility types that were not initially reflected in the HSM-1, in order to expand the breadth and depth of the HSM in the future.

The IHSDM Crash Prediction Module (CPM) is intended as a faithful implementation of HSM Part C predictive methods. As NCHRP projects to develop new predictive methods for the HSM are completed, FHWA works to incorporate the new methods into IHSDM, sometimes in advance of publication in the HSM. The following new crash predictive methods have been accepted by NCHRP project panels and incorporated into IHSDM, while pending AASHTO's approval for incorporation into a future edition of the HSM:

- Roundabouts: completed in 2018 under NCHRP Project 17-70, the new methods will provide improved outcomes for the safety analysis of roundabouts.
- 6+ lane and one-way urban/suburban arterials (including models for segments and intersections): completed under NCHRP Project 17-58.

However, in the absence of local calibration factors (see HSM-1 Part C, Appendix A for guidance on calibration of the predictive models), it is neither appropriate nor advisable to directly compare the results from new models (from NCHRP Projects 17-58 and 17-70) to results from HSM-1 models, as the models were not calibrated to the same base state data sets, and consequently can produce unexpected results. If local calibration factors are available and applied to both new models and HSM-1 models, then it may be appropriate to directly compare the results.*[Note: Work being performed under NCHRP Project 17-72 (Update of Crash Modification Factors for the Highway Safety Manual) is expected to re-calibrate many of the old (HSM-1) and new (e.g., NCHRP 17-70) models to data from a single (or small number of) states, that would allow results from all models to be directly compared.]*

The models produced for NCHRP Project 17-70 have independent value in terms of informing the design of a roundabout and assessing the effects of different design characteristics on the expected safety performance of a roundabout.

The HSM-1 interim method previously included in IHSDM for evaluating roundabouts on urban/suburban arterials (i.e., evaluating an existing intersection and then applying a Crash Modification Factor for replacing the existing intersection with a roundabout) has been deactivated in IHSDM, to minimize any confusion with the new roundabout methodology.

Section Types

Rural Two Lane Site Set CPM Evaluation

Site Type

Type: 4ST
Calibration Factor: 1

Table 1. Evaluation and Crash Data (CSD) (if applicable) Intersection Sites

Site No.	Type	Highway	Site Description	Major AADT	Minor AADT	Number of Approaches with Left-Turn Lanes	Number of Approaches with Right-Turn Lanes	Skew Angle 1 (deg)	Skew Angle 2 (deg)	Presence of Lighting
1	4ST	STH 21 & CTH FF	Overlay & Concrete Repair	2027-2036: 11090	2027: 2118; 2028: 2133; 2029: 2148; 2030: 2162; 2031: 2177; 2032: 2192; 2033: 2207; 2034: 2222; 2035: 2237; 2036: 2251	0	2	0.0000	0.0000	no

Table 2. Predicted Crash Frequencies and Rates by Site

Site No.	Type	Highway	Site Description	Total Predicted Crashes for Evaluation Period	Predicted Total Crash Frequency (crashes/yr)	Predicted FI Crash Frequency (crashes/yr)	Predicted PDO Crash Frequency (crashes/yr)	Predicted Intersection Travel Crash Rate (crashes/million veh)	Intersection Crash Rate (crashes/yr)
1	4ST	STH 21 & CTH FF	Overlay & Concrete Repair	18.976	1.8975	0.5806	1.3169	0.39	1.8975
		Total	Total	18.976	1.8975	0.5806	1.3169	0.39	1.8975

Table 3. Predicted Crash Frequencies by Year (4ST)

Year	Total Crashes	FI Crashes	Percent FI (%)	PDO Crashes	Percent PDO (%)
2027	1.86	0.57	30.600	1.29	69.400
2028	1.87	0.57	30.600	1.30	69.400
2029	1.88	0.57	30.600	1.30	69.400
2030	1.89	0.58	30.600	1.31	69.400
2031	1.89	0.58	30.600	1.31	69.400
2032	1.90	0.58	30.600	1.32	69.400
2033	1.91	0.58	30.600	1.32	69.400
2034	1.92	0.59	30.600	1.33	69.400
2035	1.93	0.59	30.600	1.34	69.400
2036	1.93	0.59	30.600	1.34	69.400
Total	18.98	5.81	30.600	13.17	69.400
Average	1.90	0.58	30.600	1.32	69.400

Note: *Fatal and Injury Crashes* and *Property Damage Only Crashes* do not necessarily sum up to *Total Crashes* because the distribution of these three crashes had been derived independently.

Table 4. Predicted 4ST Crash Type Distribution

Element Type	Crash Type	FI Crashes	Percent FI (%)	PDO Crashes	Percent PDO (%)	Total Crashes	Percent Total (%)
Intersection	Collision with Animal	0.06	0.3	3.35	17.6	3.41	18.0
Intersection	Collision with Bicycle	0.00	0.0	0.00	0.0	0.00	0.0
Intersection	Other Single-vehicle Collision	1.19	6.2	2.84	15.0	4.03	21.2
Intersection	Overturned	0.00	0.0	0.00	0.0	0.00	0.0
Intersection	Collision with Pedestrian	0.00	0.0	0.00	0.0	0.00	0.0
Intersection	Run Off Road	0.00	0.0	0.00	0.0	0.00	0.0
Intersection	Total Single Vehicle Crashes	1.25	6.6	6.19	32.6	7.44	39.2
Intersection	Angle Collision	2.66	14.0	2.83	14.9	5.48	28.9
Intersection	Head-on Collision	0.00	0.0	0.00	0.0	0.00	0.0
Intersection	Other Multiple-vehicle Collision	0.22	1.1	0.28	1.5	0.49	2.6
Intersection	Rear-end Collision	1.25	6.6	2.28	12.0	3.53	18.6
Intersection	Sideswipe	0.44	2.3	1.59	8.4	2.03	10.7
Intersection	Total Multiple Vehicle Crashes	4.56	24.0	6.98	36.8	11.54	60.8
Intersection	Total Intersection Crashes	5.80	30.6	13.16	69.4	18.98	100.0
	Total Crashes	5.80	30.6	13.16	69.4	18.98	100.0

Note: *Fatal and Injury Crashes* and *Property Damage Only Crashes* do not necessarily sum up to *Total Crashes* because the distribution of these three crashes had been derived independently.

Interactive Highway Safety Design Model

Crash Prediction Evaluation Report

STH 21 & CTH FF
Mainline Left Turn Lanes

August 6, 2020

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Report Template: System: Multi-Page, 508 Compliant [System] (sscpm4, Jan 20, 2020 2:20 PM)

Evaluation Date: Thu Aug 06 09:01:13 CDT 2020
IHSDM Version: v15.0.0 (Oct 31, 2019)
Site Set Crash Prediction Module: v|ModuleInfo.moduleVersion| (|ModuleInfo.moduleDate|)

User Name: Scott Nelson
Organization Name: WisDOT NE Region
Phone: 920.366.2109
E-Mail: scott.nelson@dot.wi.gov

Project Title: 6180-30-00, STH 21 from STH 116 to Leonard Point
Project Comment: Created Wed Jul 01 13:40:49 CDT 2020
Project Unit System: U.S. Customary

Site Set: CTH FF Intersection with STH 21 Left Turn Lanes
Site Set Comment: Copied from CTH FF Intersection Overlay & Concrete Repair (v3)
Site Set Version: v4

Evaluation Title: CTH FF Predicted Crashes Left Turn Lanes
Evaluation Comment: Created Thu Aug 06 09:00:49 CDT 2020
Policy for Superelevation: AASHTO 2011 U.S. Customary
Calibration: WisDOT Calibration_v15-0
Crash Distribution: WisDOT Distributions_v15-0
Model/CMF: WisDOT Models_v15-0
Note: A Model Data Set other than the HSM (Highway Safety Manual) Configuration was selected for this Evaluation. If Crash Modification Factors (CMFs) were modified, then the results will not be in accordance with the HSM (see HSM Appendix to Part C, section A.1.3).
First Year of Analysis: 2027
Last Year of Analysis: 2036
Empirical-Bayes Analysis: None

Disclaimer Regarding Crash Prediction Method

IMPORTANT NOTICE ABOUT COMPARING RESULTS FROM HIGHWAY SAFETY MANUAL FIRST EDITION (2010) MODELS TO RESULTS FROM NEW MODELS DEVELOPED UNDER NCHRP PROJECTS 17-70 AND 17-58

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Highway and Transportation Officials (AASHTO), multiple research efforts have been undertaken through the National Cooperative Highway Research Program (NCHRP) to develop safety performance models for road segment and intersection facility types that were not initially reflected in the HSM-1, in order to expand the breadth and depth of the HSM in the future.

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Section Types

Rural Two Lane Site Set CPM Evaluation

Site Type

Type: 4ST
Calibration Factor: 1

Table 1. Evaluation and Crash Data (CSD) (if applicable) Intersection Sites

Site No.	Type	Highway	Site Description	Major AADT	Minor AADT	Number of Approaches with Left-Turn Lanes	Number of Approaches with Right-Turn Lanes	Skew Angle 1 (deg)	Skew Angle 2 (deg)	Presence of Lighting
1	4ST	STH 21 & CTH FF	Overlay & Concrete Repair	2027-2036: 11090	2027: 2118; 2028: 2133; 2029: 2148; 2030: 2162; 2031: 2177; 2032: 2192; 2033: 2207; 2034: 2222; 2035: 2237; 2036: 2251	2	2	0.0000	0.0000	no

Table 2. Predicted Crash Frequencies and Rates by Site

Site No.	Type	Highway	Site Description	Total Predicted Crashes for Evaluation Period	Predicted Total Crash Frequency (crashes/yr)	Predicted FI Crash Frequency (crashes/yr)	Predicted PDO Crash Frequency (crashes/yr)	Predicted Intersection Travel Crash Rate (crashes/million veh)	Intersection Crash Rate (crashes/yr)
1	4ST	STH 21 & CTH FF	Overlay & Concrete Repair	9.867	0.9867	0.3019	0.6848	0.20	0.9867
		Total	Total	9.867	0.9867	0.3019	0.6848	0.20	0.9867

Table 3. Predicted Crash Frequencies by Year (4ST)

Year	Total Crashes	FI Crashes	Percent FI (%)	PDO Crashes	Percent PDO (%)
2027	0.97	0.30	30.600	0.67	69.400
2028	0.97	0.30	30.600	0.68	69.400
2029	0.98	0.30	30.600	0.68	69.400
2030	0.98	0.30	30.600	0.68	69.400
2031	0.98	0.30	30.600	0.68	69.400
2032	0.99	0.30	30.600	0.69	69.400
2033	0.99	0.30	30.600	0.69	69.400
2034	1.00	0.30	30.600	0.69	69.400
2035	1.00	0.31	30.600	0.69	69.400
2036	1.00	0.31	30.600	0.70	69.400
Total	9.87	3.02	30.600	6.85	69.400
Average	0.99	0.30	30.600	0.69	69.400

Note: *Fatal and Injury Crashes* and *Property Damage Only Crashes* do not necessarily sum up to *Total Crashes* because the distribution of these three crashes had been derived independently.

Table 4. Predicted 4ST Crash Type Distribution

Element Type	Crash Type	FI Crashes	Percent FI (%)	PDO Crashes	Percent PDO (%)	Total Crashes	Percent Total (%)
Intersection	Collision with Animal	0.03	0.3	1.74	17.6	1.77	18.0
Intersection	Collision with Bicycle	0.00	0.0	0.00	0.0	0.00	0.0
Intersection	Other Single-vehicle Collision	0.62	6.2	1.48	15.0	2.10	21.2
Intersection	Overturned	0.00	0.0	0.00	0.0	0.00	0.0
Intersection	Collision with Pedestrian	0.00	0.0	0.00	0.0	0.00	0.0
Intersection	Run Off Road	0.00	0.0	0.00	0.0	0.00	0.0
Intersection	Total Single Vehicle Crashes	0.65	6.6	3.22	32.6	3.87	39.2
Intersection	Angle Collision	1.38	14.0	1.47	14.9	2.85	28.9
Intersection	Head-on Collision	0.00	0.0	0.00	0.0	0.00	0.0
Intersection	Other Multiple-vehicle Collision	0.11	1.1	0.14	1.5	0.26	2.6
Intersection	Rear-end Collision	0.65	6.6	1.19	12.0	1.83	18.6
Intersection	Sideswipe	0.23	2.3	0.83	8.4	1.06	10.7
Intersection	Total Multiple Vehicle Crashes	2.37	24.0	3.63	36.8	6.00	60.8
Intersection	Total Intersection Crashes	3.02	30.6	6.85	69.4	9.87	100.0
	Total Crashes	3.02	30.6	6.85	69.4	9.87	100.0

Note: *Fatal and Injury Crashes* and *Property Damage Only Crashes* do not necessarily sum up to *Total Crashes* because the distribution of these three crashes had been derived independently.

Interactive Highway Safety Design Model

Crash Prediction Evaluation Report

STH 21 & CTH FF
Roundabout Alternative

August 6, 2020

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Report Overview

Report Generated: Aug 6, 2020 9:14 AM
Report Template: System: Multi-Page, 508 Compliant [System] (sscpm4, Jan 20, 2020 2:20 PM)

Evaluation Date: Thu Aug 06 09:01:52 CDT 2020
IHSDM Version: v15.0.0 (Oct 31, 2019)
Site Set Crash Prediction Module: v|ModuleInfo.moduleVersion| (|ModuleInfo.moduleDate|)

User Name: Scott Nelson
Organization Name: WisDOT NE Region
Phone: 920.366.2109
E-Mail: scott.nelson@dot.wi.gov

Project Title: 6180-30-00, STH 21 from STH 116 to Leonard Point
Project Comment: Created Wed Jul 01 13:40:49 CDT 2020
Project Unit System: U.S. Customary

Site Set: CTH FF Intersection Single Lane Roundabout
Site Set Comment: Created Wed Jul 01 14:00:43 CDT 2020
Site Set Version: v2

Evaluation Title: CTH FF Crash Prediction Roundabout
Evaluation Comment: Created Thu Aug 06 09:01:29 CDT 2020
Policy for Superelevation: AASHTO 2011 U.S. Customary
Calibration: WisDOT Calibration_v15-0
Crash Distribution: WisDOT Distributions_v15-0
Model/CMF: WisDOT Models_v15-0
Note: A Model Data Set other than the HSM (Highway Safety Manual) Configuration was selected for this Evaluation. If Crash Modification Factors (CMFs) were modified, then the results will not be in accordance with the HSM (see HSM Appendix to Part C, section A.1.3).
First Year of Analysis: 2027
Last Year of Analysis: 2036
Empirical-Bayes Analysis: None

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Section Types

Roundabout Site Set CPM Evaluation

Site Type

Type: Roundabout RTL 41R
Calibration Factor: RTL 41R = 1.0

Table 1. Evaluation and Crash Data (CSD) (if applicable) Roundabout - Homogeneous Sites

Site No.	Type	Roundabout	Area Type	Entering AADT
1	41R - Roundabout with 4 legs and a single circulating lane	STH 21 & CTH FF	Rural	Leg 1:2027: 364; 2028: 366; 2029: 368; 2030: 370; 2031: 372; 2032: 374; 2033: 375; 2034: 377; 2035: 379; 2036: 381; Leg 2:2027-2036: 5545; Leg 3:2027: 694; 2028: 700; 2029: 705; 2030: 711; 2031: 716; 2032: 722; 2033: 727; 2034: 733; 2035: 738; 2036: 744; Leg 4:2027-2036: 5545

Table 2. Predicted Crash Frequencies and Rates by Site

Site No.	Type	Roundabout	Site Description	Total Predicted Crashes for Evaluation Period	Predicted Total Crash Frequency (crashes/yr)	Predicted FI Crash Frequency (crashes/yr)	Predicted PDO Crash Frequency (crashes/yr)	Predicted Intersection Travel Crash Rate (crashes/million veh)	Intersection Crash Rate (crashes/yr)
1	41R - Roundabout with 4 legs and a single circulating lane	STH 21 & CTH FF		18.011	1.8011	0.2360	1.5651	0.81	1.8011
		Total	Total	18.011	1.8011	0.2360	1.5651	0.81	1.8011

Table 3. Predicted Crash Frequencies by Year (Roundabout RTL 41R)

Year	Total Crashes	FI Crashes	Percent FI (%)	PDO Crashes	Percent PDO (%)
2027	1.80	0.23	13.097	1.56	86.903
2028	1.80	0.24	13.098	1.56	86.901
2029	1.80	0.24	13.100	1.56	86.900
2030	1.80	0.24	13.101	1.56	86.898
2031	1.80	0.24	13.103	1.56	86.897
2032	1.80	0.24	13.104	1.56	86.895
2033	1.80	0.24	13.106	1.57	86.894
2034	1.80	0.24	13.107	1.57	86.893
2035	1.80	0.24	13.109	1.57	86.891
2036	1.80	0.24	13.110	1.57	86.890
Total	18.01	2.36	13.104	15.65	86.896
Average	1.80	0.24	13.104	1.56	86.896

Note: *Fatal and Injury Crashes* and *Property Damage Only Crashes* do not necessarily sum up to *Total Crashes* because the distribution of these three crashes had been derived independently.

Table 4. Predicted Roundabout RTL 41R Crash Severity

Site No.	Fatal (K) Crashes (crashes)	Incapacitating Injury (A) Crashes (crashes)	Non-Incapacitating Injury (B) Crashes (crashes)	Possible Injury (C) Crashes (crashes)	No Injury (O) Crashes (crashes)
1	0.0178	0.1766	1.1362	1.0295	15.6510
Total	0.0178	0.1766	1.1362	1.0295	15.6510

Table 5. Predicted Roundabout RTL 41R Crash Type Distribution

Element Type	Crash Type	FI Crashes	Percent FI (%)	PDO Crashes	Percent PDO (%)	Total Crashes	Percent Total (%)
Intersection	Collision with Animal	0.00	0.0	0.22	1.2	0.22	1.2
Intersection	Collision with Fixed Object	0.51	2.8	4.08	22.7	4.59	25.5
Intersection	Collision with Other Object	0.00	0.0	0.00	0.0	0.00	0.0
Intersection	Other Single-vehicle Collision	0.49	2.7	1.82	10.1	2.31	12.8
Intersection	Collision with Parked Vehicle	0.01	0.0	0.05	0.3	0.05	0.3
Intersection	Total Single Vehicle Crashes	1.01	5.6	6.17	34.2	7.17	39.8
Intersection	Angle Collision	0.27	1.5	2.33	12.9	2.60	14.4
Intersection	Head-on Collision	0.03	0.1	0.06	0.3	0.09	0.5
Intersection	Other Multiple-vehicle Collision	0.17	0.9	1.10	6.1	1.26	7.0
Intersection	Rear-end Collision	0.70	3.9	3.88	21.5	4.58	25.4
Intersection	Sideswipe	0.18	1.0	2.13	11.8	2.31	12.8
Intersection	Total Multiple Vehicle Crashes	1.35	7.5	9.50	52.7	10.85	60.2
Intersection	Total Intersection Crashes	2.36	13.1	15.67	86.9	18.03	100.0
	Total Crashes	2.36	13.1	15.67	86.9	18.03	100.0

Note: *Fatal and Injury Crashes* and *Property Damage Only Crashes* do not necessarily sum up to *Total Crashes* because the distribution of these three crashes had been derived independently.

Interactive Highway Safety Design Model

Crash Prediction Evaluation Report

STH 21 & Sand Pit Road
Overlay & Concrete Repair
Base Case

August 6, 2020

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Report Overview

Report Generated: Aug 6, 2020 9:16 AM
Report Template: System: Multi-Page, 508 Compliant [System] (sscpm4, Jan 20, 2020 2:20 PM)

Evaluation Date: Thu Aug 06 09:02:36 CDT 2020
IHSDM Version: v15.0.0 (Oct 31, 2019)
Site Set Crash Prediction Module: v|ModuleInfo.moduleVersion| (|ModuleInfo.moduleDate|)

User Name: Scott Nelson
Organization Name: WisDOT NE Region
Phone: 920.366.2109
E-Mail: scott.nelson@dot.wi.gov

Project Title: 6180-30-00, STH 21 from STH 116 to Leonard Point
Project Comment: Created Wed Jul 01 13:40:49 CDT 2020
Project Unit System: U.S. Customary

Site Set: Sand Pit Road Intersection Overlay & Concrete Repair
Site Set Comment: Created Wed Jul 01 15:29:11 CDT 2020
Site Set Version: v2

Evaluation Title: Sand Pit Predicted Crashes Overlay and Concrete Repair
Evaluation Comment: Created Thu Aug 06 09:02:06 CDT 2020
Policy for Superelevation: AASHTO 2011 U.S. Customary
Calibration: WisDOT Calibration_v15-0
Crash Distribution: WisDOT Distributions_v15-0
Model/CMF: WisDOT Models_v15-0
Note: A Model Data Set other than the HSM (Highway Safety Manual) Configuration was selected for this Evaluation. If Crash Modification Factors (CMFs) were modified, then the results will not be in accordance with the HSM (see HSM Appendix to Part C, section A.1.3).
First Year of Analysis: 2027
Last Year of Analysis: 2036
Empirical-Bayes Analysis: None

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Section Types

Rural Two Lane Site Set CPM Evaluation

Site Type

Type: 4ST
Calibration Factor: 1

Table 1. Evaluation and Crash Data (CSD) (if applicable) Intersection Sites

Site No.	Type	Highway	Site Description	Major AADT	Minor AADT	Number of Approaches with Left-Turn Lanes	Number of Approaches with Right-Turn Lanes	Skew Angle 1 (deg)	Skew Angle 2 (deg)	Presence of Lighting
1	4ST	Sand Pit Road		2027-2036: 14340	2027: 1259; 2028: 1266; 2029: 1274; 2030: 1281; 2031: 1288; 2032: 1296; 2033: 1303; 2034: 1311; 2035: 1318; 2036: 1325	0	2	0.0000	0.0000	no

Table 2. Predicted Crash Frequencies and Rates by Site

Site No.	Type	Highway	Site Description	Total Predicted Crashes for Evaluation Period	Predicted Total Crash Frequency (crashes/yr)	Predicted FI Crash Frequency (crashes/yr)	Predicted PDO Crash Frequency (crashes/yr)	Predicted Intersection Travel Crash Rate (crashes/million veh)	Intersection Crash Rate (crashes/yr)
1	4ST	Sand Pit Road		16.070	1.6071	0.4918	1.1153	0.28	1.6071
		Total	Total	16.070	1.6071	0.4918	1.1153	0.28	1.6071

Table 3. Predicted Crash Frequencies by Year (4ST)

Year	Total Crashes	FI Crashes	Percent FI (%)	PDO Crashes	Percent PDO (%)
2027	1.58	0.48	30.600	1.10	69.400
2028	1.59	0.49	30.600	1.10	69.400
2029	1.59	0.49	30.600	1.11	69.400
2030	1.60	0.49	30.600	1.11	69.400
2031	1.60	0.49	30.600	1.11	69.400
2032	1.61	0.49	30.600	1.12	69.400
2033	1.61	0.49	30.600	1.12	69.400
2034	1.62	0.50	30.600	1.12	69.400
2035	1.63	0.50	30.600	1.13	69.400
2036	1.63	0.50	30.600	1.13	69.400
Total	16.07	4.92	30.600	11.15	69.400
Average	1.61	0.49	30.600	1.11	69.400

Note: *Fatal and Injury Crashes* and *Property Damage Only Crashes* do not necessarily sum up to *Total Crashes* because the distribution of these three crashes had been derived independently.

Table 4. Predicted 4ST Crash Type Distribution

Element Type	Crash Type	FI Crashes	Percent FI (%)	PDO Crashes	Percent PDO (%)	Total Crashes	Percent Total (%)
Intersection	Collision with Animal	0.05	0.3	2.83	17.6	2.89	18.0
Intersection	Collision with Bicycle	0.00	0.0	0.00	0.0	0.00	0.0
Intersection	Other Single-vehicle Collision	1.00	6.2	2.41	15.0	3.41	21.2
Intersection	Overturned	0.00	0.0	0.00	0.0	0.00	0.0
Intersection	Collision with Pedestrian	0.00	0.0	0.00	0.0	0.00	0.0
Intersection	Run Off Road	0.00	0.0	0.00	0.0	0.00	0.0
Intersection	Total Single Vehicle Crashes	1.06	6.6	5.24	32.6	6.30	39.2
Intersection	Angle Collision	2.25	14.0	2.39	14.9	4.64	28.9
Intersection	Head-on Collision	0.00	0.0	0.00	0.0	0.00	0.0
Intersection	Other Multiple-vehicle Collision	0.18	1.1	0.23	1.5	0.42	2.6
Intersection	Rear-end Collision	1.06	6.6	1.93	12.0	2.99	18.6
Intersection	Sideswipe	0.37	2.3	1.35	8.4	1.72	10.7
Intersection	Total Multiple Vehicle Crashes	3.86	24.0	5.91	36.8	9.77	60.8
Intersection	Total Intersection Crashes	4.92	30.6	11.15	69.4	16.07	100.0
	Total Crashes	4.92	30.6	11.15	69.4	16.07	100.0

Note: *Fatal and Injury Crashes* and *Property Damage Only Crashes* do not necessarily sum up to *Total Crashes* because the distribution of these three crashes had been derived independently.

Interactive Highway Safety Design Model

Crash Prediction Evaluation Report

STH 21 & Sand Pit Road
Mainline Left Turns Alternative

August 6, 2020

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Report Overview

Report Generated: Aug 6, 2020 9:16 AM
Report Template: System: Multi-Page, 508 Compliant [System] (sscpm4, Jan 20, 2020 2:20 PM)

Evaluation Date: Thu Aug 06 09:03:12 CDT 2020
IHSDM Version: v15.0.0 (Oct 31, 2019)
Site Set Crash Prediction Module: v|ModuleInfo.moduleVersion| (|ModuleInfo.moduleDate|)

User Name: Scott Nelson
Organization Name: WisDOT NE Region
Phone: 920.366.2109
E-Mail: scott.nelson@dot.wi.gov

Project Title: 6180-30-00, STH 21 from STH 116 to Leonard Point
Project Comment: Created Wed Jul 01 13:40:49 CDT 2020
Project Unit System: U.S. Customary

Site Set: Sand Pit Road Intersection STH 21 Left Turn Lanes
Site Set Comment: Copied from Sand Pit Road Intersection Overlay & Concrete Repair (v2)
Site Set Version: v2

Evaluation Title: Sand Pit Predicted Crashes Left Turn Lanes
Evaluation Comment: Created Thu Aug 06 09:02:51 CDT 2020
Policy for Superelevation: AASHTO 2011 U.S. Customary
Calibration: WisDOT Calibration_v15-0
Crash Distribution: WisDOT Distributions_v15-0
Model/CMF: WisDOT Models_v15-0
Note: A Model Data Set other than the HSM (Highway Safety Manual) Configuration was selected for this Evaluation. If Crash Modification Factors (CMFs) were modified, then the results will not be in accordance with the HSM (see HSM Appendix to Part C, section A.1.3).
First Year of Analysis: 2027
Last Year of Analysis: 2036
Empirical-Bayes Analysis: None

Disclaimer Regarding Crash Prediction Method

IMPORTANT NOTICE ABOUT COMPARING RESULTS FROM HIGHWAY SAFETY MANUAL FIRST EDITION (2010) MODELS TO RESULTS FROM NEW MODELS DEVELOPED UNDER NCHRP PROJECTS 17-70 AND 17-58

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- 6+ lane and one-way urban/suburban arterials (including models for segments and intersections): completed under NCHRP Project 17-58.

However, in the absence of local calibration factors (see HSM-1 Part C, Appendix A for guidance on calibration of the predictive models), it is neither appropriate nor advisable to directly compare the results from new models (from NCHRP Projects 17-58 and 17-70) to results from HSM-1 models, as the models were not calibrated to the same base state data sets, and consequently can produce unexpected results. If local calibration factors are available and applied to both new models and HSM-1 models, then it may be appropriate to directly compare the results.*[Note: Work being performed under NCHRP Project 17-72 (Update of Crash Modification Factors for the Highway Safety Manual) is expected to re-calibrate many of the old (HSM-1) and new (e.g., NCHRP 17-70) models to data from a single (or small number of) states, that would allow results from all models to be directly compared.]*

The models produced for NCHRP Project 17-70 have independent value in terms of informing the design of a roundabout and assessing the effects of different design characteristics on the expected safety performance of a roundabout.

The HSM-1 interim method previously included in IHSDM for evaluating roundabouts on urban/suburban arterials (i.e., evaluating an existing intersection and then applying a Crash Modification Factor for replacing the existing intersection with a roundabout) has been deactivated in IHSDM, to minimize any confusion with the new roundabout methodology.

Section Types

Rural Two Lane Site Set CPM Evaluation

Site Type

Type: 4ST
Calibration Factor: 1

Table 1. Evaluation and Crash Data (CSD) (if applicable) Intersection Sites

Site No.	Type	Highway	Site Description	Major AADT	Minor AADT	Number of Approaches with Left-Turn Lanes	Number of Approaches with Right-Turn Lanes	Skew Angle 1 (deg)	Skew Angle 2 (deg)	Presence of Lighting
1	4ST	Sand Pit Road		2027-2036: 14340	2027: 1259; 2028: 1266; 2029: 1274; 2030: 1281; 2031: 1288; 2032: 1296; 2033: 1303; 2034: 1311; 2035: 1318; 2036: 1325	2	2	0.0000	0.0000	no

Table 2. Predicted Crash Frequencies and Rates by Site

Site No.	Type	Highway	Site Description	Total Predicted Crashes for Evaluation Period	Predicted Total Crash Frequency (crashes/yr)	Predicted FI Crash Frequency (crashes/yr)	Predicted PDO Crash Frequency (crashes/yr)	Predicted Intersection Travel Crash Rate (crashes/million veh)	Intersection Crash Rate (crashes/yr)
1	4ST	Sand Pit Road		8.357	0.8357	0.2557	0.5800	0.15	0.8357
		Total	Total	8.357	0.8357	0.2557	0.5800	0.15	0.8357

Table 3. Predicted Crash Frequencies by Year (4ST)

Year	Total Crashes	FI Crashes	Percent FI (%)	PDO Crashes	Percent PDO (%)
2027	0.82	0.25	30.600	0.57	69.400
2028	0.82	0.25	30.600	0.57	69.400
2029	0.83	0.25	30.600	0.57	69.400
2030	0.83	0.25	30.600	0.58	69.400
2031	0.83	0.26	30.600	0.58	69.400
2032	0.84	0.26	30.600	0.58	69.400
2033	0.84	0.26	30.600	0.58	69.400
2034	0.84	0.26	30.600	0.58	69.400
2035	0.85	0.26	30.600	0.59	69.400
2036	0.85	0.26	30.600	0.59	69.400
Total	8.36	2.56	30.600	5.80	69.400
Average	0.84	0.26	30.600	0.58	69.400

Note: *Fatal and Injury Crashes* and *Property Damage Only Crashes* do not necessarily sum up to *Total Crashes* because the distribution of these three crashes had been derived independently.

Table 4. Predicted 4ST Crash Type Distribution

Element Type	Crash Type	FI Crashes	Percent FI (%)	PDO Crashes	Percent PDO (%)	Total Crashes	Percent Total (%)
Intersection	Collision with Animal	0.03	0.3	1.47	17.6	1.50	18.0
Intersection	Collision with Bicycle	0.00	0.0	0.00	0.0	0.00	0.0
Intersection	Other Single-vehicle Collision	0.52	6.2	1.25	15.0	1.77	21.2
Intersection	Overturned	0.00	0.0	0.00	0.0	0.00	0.0
Intersection	Collision with Pedestrian	0.00	0.0	0.00	0.0	0.00	0.0
Intersection	Run Off Road	0.00	0.0	0.00	0.0	0.00	0.0
Intersection	Total Single Vehicle Crashes	0.55	6.6	2.73	32.6	3.28	39.2
Intersection	Angle Collision	1.17	14.0	1.24	14.9	2.41	28.9
Intersection	Head-on Collision	0.00	0.0	0.00	0.0	0.00	0.0
Intersection	Other Multiple-vehicle Collision	0.10	1.1	0.12	1.5	0.22	2.6
Intersection	Rear-end Collision	0.55	6.6	1.00	12.0	1.55	18.6
Intersection	Sideswipe	0.19	2.3	0.70	8.4	0.89	10.7
Intersection	Total Multiple Vehicle Crashes	2.01	24.0	3.07	36.8	5.08	60.8
Intersection	Total Intersection Crashes	2.56	30.6	5.80	69.4	8.36	100.0
	Total Crashes	2.56	30.6	5.80	69.4	8.36	100.0

Note: *Fatal and Injury Crashes* and *Property Damage Only Crashes* do not necessarily sum up to *Total Crashes* because the distribution of these three crashes had been derived independently.

Interactive Highway Safety Design Model

Crash Prediction Evaluation Report

STH 21 & Sand Pit Road
Roundabout Alternative

August 6, 2020

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Report Overview

Report Generated: Aug 6, 2020 9:18 AM
Report Template: System: Multi-Page, 508 Compliant [System] (sscpm4, Jan 20, 2020 2:20 PM)

Evaluation Date: Thu Aug 06 09:03:53 CDT 2020
IHSDM Version: v15.0.0 (Oct 31, 2019)
Site Set Crash Prediction Module: v|ModuleInfo.moduleVersion| (|ModuleInfo.moduleDate|)

User Name: Scott Nelson
Organization Name: WisDOT NE Region
Phone: 920.366.2109
E-Mail: scott.nelson@dot.wi.gov

Project Title: 6180-30-00, STH 21 from STH 116 to Leonard Point
Project Comment: Created Wed Jul 01 13:40:49 CDT 2020
Project Unit System: U.S. Customary

Site Set: Sand Pit Road Intersection Roundabout
Site Set Comment: Copied from Sand Pit Road Intersection STH 21 Left Turn Lanes (v2)
Site Set Version: v4

Evaluation Title: Sand Pit Predicted Crashes Roundabout
Evaluation Comment: Created Thu Aug 06 09:03:27 CDT 2020
Policy for Superelevation: AASHTO 2011 U.S. Customary
Calibration: WisDOT Calibration_v15-0
Crash Distribution: WisDOT Distributions_v15-0
Model/CMF: WisDOT Models_v15-0
Note: A Model Data Set other than the HSM (Highway Safety Manual) Configuration was selected for this Evaluation. If Crash Modification Factors (CMFs) were modified, then the results will not be in accordance with the HSM (see HSM Appendix to Part C, section A.1.3).
First Year of Analysis: 2027
Last Year of Analysis: 2036
Empirical-Bayes Analysis: None

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Section Types

Roundabout Site Set CPM Evaluation

Site Type

Type: Roundabout RTL 41R
Calibration Factor: RTL 41R = 1.0

Table 1. Evaluation and Crash Data (CSD) (if applicable) Roundabout - Homogeneous Sites

Site No.	Type	Roundabout	Area Type	Entering AADT
1	41R - Roundabout with 4 legs and a single circulating lane	Sand Pit Road	Rural	Leg 1:2027: 629; 2028: 633; 2029: 637; 2030: 640; 2031: 644; 2032: 648; 2033: 651; 2034: 655; 2035: 659; 2036: 662; Leg 2:2027-2036: 7170; Leg 3:2027: 629; 2028: 633; 2029: 637; 2030: 640; 2031: 644; 2032: 648; 2033: 651; 2034: 655; 2035: 659; 2036: 662; Leg 4:2027-2036: 7170

Table 2. Predicted Crash Frequencies and Rates by Site

Site No.	Type	Roundabout	Site Description	Total Predicted Crashes for Evaluation Period	Predicted Total Crash Frequency (crashes/yr)	Predicted FI Crash Frequency (crashes/yr)	Predicted PDO Crash Frequency (crashes/yr)	Predicted Intersection Travel Crash Rate (crashes/million veh)	Intersection Crash Rate (crashes/yr)
1	41R - Roundabout with 4 legs and a single circulating lane	Sand Pit Road		21.610	2.1610	0.2965	1.8645	0.76	2.1610
		Total	Total	21.610	2.1610	0.2965	1.8645	0.76	2.1610

Table 3. Predicted Crash Frequencies by Year (Roundabout RTL 41R)

Year	Total Crashes	FI Crashes	Percent FI (%)	PDO Crashes	Percent PDO (%)
2027	2.16	0.30	13.715	1.86	86.285
2028	2.16	0.30	13.716	1.86	86.284
2029	2.16	0.30	13.717	1.86	86.282
2030	2.16	0.30	13.718	1.86	86.282
2031	2.16	0.30	13.720	1.86	86.280
2032	2.16	0.30	13.721	1.86	86.279
2033	2.16	0.30	13.722	1.86	86.278
2034	2.16	0.30	13.723	1.87	86.277
2035	2.16	0.30	13.725	1.87	86.275
2036	2.16	0.30	13.726	1.87	86.275
Total	21.61	2.96	13.720	18.64	86.280
Average	2.16	0.30	13.720	1.86	86.280

Note: *Fatal and Injury Crashes* and *Property Damage Only Crashes* do not necessarily sum up to *Total Crashes* because the distribution of these three crashes had been derived independently.

Table 4. Predicted Roundabout RTL 41R Crash Severity

Site No.	Fatal (K) Crashes (crashes)	Incapacitating Injury (A) Crashes (crashes)	Non-Incapacitating Injury (B) Crashes (crashes)	Possible Injury (C) Crashes (crashes)	No Injury (O) Crashes (crashes)
1	0.0191	0.1898	1.2209	1.5353	18.6452
Total	0.0191	0.1898	1.2209	1.5353	18.6452

Table 5. Predicted Roundabout RTL 41R Crash Type Distribution

Element Type	Crash Type	FI Crashes	Percent FI (%)	PDO Crashes	Percent PDO (%)	Total Crashes	Percent Total (%)
Intersection	Collision with Animal	0.00	0.0	0.26	1.2	0.26	1.2
Intersection	Collision with Fixed Object	0.64	3.0	4.87	22.5	5.51	25.5
Intersection	Collision with Other Object	0.00	0.0	0.00	0.0	0.00	0.0
Intersection	Other Single-vehicle Collision	0.62	2.9	2.16	10.0	2.78	12.9
Intersection	Collision with Parked Vehicle	0.01	0.0	0.06	0.3	0.06	0.3
Intersection	Total Single Vehicle Crashes	1.27	5.9	7.35	34.0	8.61	39.8
Intersection	Angle Collision	0.34	1.6	2.78	12.8	3.12	14.4
Intersection	Head-on Collision	0.03	0.2	0.07	0.3	0.11	0.5
Intersection	Other Multiple-vehicle Collision	0.21	1.0	1.30	6.0	1.52	7.0
Intersection	Rear-end Collision	0.88	4.1	4.62	21.4	5.51	25.5
Intersection	Sideswipe	0.23	1.1	2.54	11.7	2.77	12.8
Intersection	Total Multiple Vehicle Crashes	1.70	7.9	11.32	52.3	13.02	60.2
Intersection	Total Intersection Crashes	2.96	13.7	18.66	86.3	21.63	100.0
	Total Crashes	2.96	13.7	18.66	86.3	21.63	100.0

Note: *Fatal and Injury Crashes* and *Property Damage Only Crashes* do not necessarily sum up to *Total Crashes* because the distribution of these three crashes had been derived independently.

ATTACHMENT E

Safety Mitigation Certification Documentation

IHSDM Economic Analysis Report

Interactive Highway Safety Design Model

Economic Analysis Report

STH 21 & CTH FF

August 6, 2020

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Economic Analysis Report

Economic Analysis Report Overview

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Report Template: System: Multi-Page [System] (eam2, Jan 20, 2020 2:20 PM)

Evaluation Title: EAAnalysis Updated 8/6/2020
Evaluation Comment: Created Thu Aug 06 09:06:21 CDT 2020
Evaluation Date: Thu Aug 06 09:06:46 CDT 2020

User Name: Scott Nelson
Organization Name: WisDOT NE Region
Phone: 920.366.2109
E-Mail: scott.nelson@dot.wi.gov

Project Title: 6180-30-00, STH 21 & CTH FF Evaluation
Project Comment: Created Wed Jul 01 14:29:10 CDT 2020

Configuration Summary

Crash Cost Configuration: WisDOT Economics_v15-0
Configuration Comment: WisDOT Crash Costs

Table 1. Economic Analysis Configuration

Configuration Data	
Crash Unit Cost Zero Year	**2016**
Crash Cost Index	**0.00**
Discount Rate	**0.03**
KABCO Unit Costs	
K Cost ($/Crash)	**10,897,580.00**
A Cost ($/Crash)	**613,781.00**
B Cost ($/Crash)	**194,022.00**
C Cost ($/Crash)	**110,830.00**
O Cost ($/Crash)	**10,173.00**

Table 2. RTL Segment FI Proportion Data

Segment Type	Fatal Crash (K) Proportion of FI (%)	Incapacitating Injury Crash (A) Proportion of FI (%)	Non-incapacitating Injury Crash (B) Proportion of FI (%)	Possible Injury Crash (C) Proportion of FI (%)
Two-Lane Undivided	3.502	12.638	43.370	40.490

Table 3. RTL Intersection FI Proportion Data

Intersection Type	Fatal Crash (K) Proportion of FI (%)	Incapacitating Injury Crash (A) Proportion of FI (%)	Non-incapacitating Injury Crash (B) Proportion of FI (%)	Possible Injury Crash (C) Proportion of FI (%)
Three-Legged w/STOP control	3.070	15.070	42.380	39.480
Four-Legged w/STOP control	3.980	15.280	42.860	37.880
Four-Legged Signalized	2.960	11.750	35.290	50.000

Table 4. RML Segment FI Proportion Data

Segment Type	Fatal Crash (K) Proportion of FI (%)	Incapacitating Injury Crash (A) Proportion of FI (%)	Non-incapacitating Injury Crash (B) Proportion of FI (%)	Possible Injury Crash (C) Proportion of FI (%)
Four-Lane Undivided	3.502	12.638	43.370	40.490
Four-Lane Divided	3.502	12.638	43.370	40.490

Table 5. RML Intersection FI Proportion Data

Intersection Type	Fatal Crash (K) Proportion of FI (%)	Incapacitating Injury Crash (A) Proportion of FI (%)	Non-incapacitating Injury Crash (B) Proportion of FI (%)	Possible Injury Crash (C) Proportion of FI (%)
Three-Legged w/STOP control	4.090	14.090	40.630	41.190
Four-Legged w/STOP control	4.710	15.910	41.990	37.390
Four-Legged Signalized	0.600	10.010	37.180	52.210

Table 6. USA Segment FI Proportion Data

Segment Type	Fatal Crash (K) Proportion of FI (%)	Incapacitating Injury Crash (A) Proportion of FI (%)	Non-incapacitating Injury Crash (B) Proportion of FI (%)	Possible Injury Crash (C) Proportion of FI (%)
Two-Lane Undivided	1.012	5.785	33.011	60.192
Three-Lane w/Center TWLTL	1.012	5.785	33.011	60.192
Four-Lane Undivided	1.012	5.785	33.011	60.192
Four-Lane Divided	1.012	5.785	33.011	60.192
Five-Lane w/Center TWLTL	1.012	5.785	33.011	60.192

Table 7. USA Intersection FI Proportion Data

Intersection Type	Fatal Crash (K) Proportion of FI (%)	Incapacitating Injury Crash (A) Proportion of FI (%)	Non-incapacitating Injury Crash (B) Proportion of FI (%)	Possible Injury Crash (C) Proportion of FI (%)
Three-Legged w/STOP control	0.744	6.558	36.725	55.973
Three-Legged Signalized	0.451	4.957	32.024	62.568
Four-Legged w/STOP control	0.864	6.637	38.161	54.338
Four-Legged Signalized	0.715	5.263	32.359	61.663

Analysis Output Summary

Analysis Type: Benefit/Cost

Table 8. Case Cost Summary

Is Base Case	Title	Present Value of Crash Cost ($)	Present Value of Other Cost ($)	Net Present Value of Benefits (B) ($)	Net Present Value of Costs (C) ($)	Present Value of Net Benefit (B-C) ($)	Benefit Cost Ratio (B/C)
Yes	Overlay and Concrete Repairs	3,443,820.60	170,000.00				
	STH 21 Left Turn Lanes Added	1,790,786.71	830,000.00	1,653,033.89	660,000.00	993,033.89	2.5046
	STH 21 & CTH FF Roundabout	698,966.63	950,000.00	2,744,853.97	780,000.00	1,964,853.97	3.5190

Table 9. Case Crash Summary

Is Base Case	Title	Fatal (K) Crashes (crashes)	Incapacitating Injury (A) Crashes (crashes)	Non-Incapacitating Injury (B) Crashes (crashes)	Possible Injury (C) Crashes (crashes)	No Injury (O) Crashes (crashes)	Total Crashes (crashes)
Yes	Overlay and Concrete Repairs	0.2311	0.8872	2.4887	2.1995	13.1690	18.9755
	STH 21 Left Turn Lanes Added	0.1202	0.4614	1.2941	1.1437	6.8479	9.8672
	STH 21 & CTH FF Roundabout	0.0178	0.1766	1.1362	1.0295	15.6510	18.0111

Crash Cost Data

Overlay and Concrete Repairs Data

Case Title: Overlay and Concrete Repairs
Is Base Case: true
Present Value of Crash Cost: 3,443,820.60
Present Value of Other Cost: 170,000.00

Table 10. Overlay and Concrete Repairs Evaluation Cost

Project or Interchange	Selected Facility	Selected Evaluation	Present Value of Crash Cost ($)
6180-30-00, STH 21 from STH 116 to Leonard Point	CTH FF Intersection Overlay & Concrete Repair	CTH FF Predicted Crashes Overlay & Concrete Repair	3,443,820.60
Total			3,443,820.60

Table 11. Overlay and Concrete Repairs Evaluation Crashes

Project or Interchange	Selected Facility	Selected Evaluation	Fatal (K) Crashes (crashes)	Incapacitating Injury (A) Crashes (crashes)	Non-Incapacitating Injury (B) Crashes (crashes)	Possible Injury (C) Crashes (crashes)	No Injury (O) Crashes (crashes)	Total Crashes (crashes)
6180-30-00, STH 21 from STH 116 to Leonard Point	CTH FF Intersection Overlay & Concrete Repair	CTH FF Predicted Crashes Overlay & Concrete Repair	0.2311	0.8872	2.4887	2.1995	13.1690	18.9755
Total			0.2311	0.8872	2.4887	2.1995	13.1690	18.9755

Table 12. CTH FF Intersection Overlay & Concrete Repair Facility Type Crashes

Facility Type	Fatal (K) Crashes (crashes)	Incapacitating Injury (A) Crashes (crashes)	Non-Incapacitating Injury (B) Crashes (crashes)	Possible Injury (C) Crashes (crashes)	No Injury (O) Crashes (crashes)	Total Crashes (crashes)
Rural Two-Lane Intersection	0.2311	0.8872	2.4887	2.1995	13.1690	18.9755
Total	0.2311	0.8872	2.4887	2.1995	13.1690	18.9755

STH 21 Left Turn Lanes Added Data

Case Title: STH 21 Left Turn Lanes Added
Is Base Case: false
Present Value of Crash Cost: 1,790,786.71
Present Value of Other Cost: 830,000.00

Table 13. STH 21 Left Turn Lanes Added Evaluation Cost

Project or Interchange	Selected Facility	Selected Evaluation	Present Value of Crash Cost ($)
6180-30-00, STH 21 from STH 116 to Leonard Point	CTH FF Intersection with STH 21 Left Turn Lanes	CTH FF Predicted Crashes Left Turn Lanes	1,790,786.71
Total			1,790,786.71

Table 14. STH 21 Left Turn Lanes Added Evaluation Crashes

Project or Interchange	Selected Facility	Selected Evaluation	Fatal (K) Crashes (crashes)	Incapacitating Injury (A) Crashes (crashes)	Non-Incapacitating Injury (B) Crashes (crashes)	Possible Injury (C) Crashes (crashes)	No Injury (O) Crashes (crashes)	Total Crashes (crashes)
6180-30-00, STH 21 from STH 116 to Leonard Point	CTH FF Intersection with STH 21 Left Turn Lanes	CTH FF Predicted Crashes Left Turn Lanes	0.1202	0.4614	1.2941	1.1437	6.8479	9.8672
Total			0.1202	0.4614	1.2941	1.1437	6.8479	9.8672

Table 15. CTH FF Intersection with STH 21 Left Turn Lanes Facility Type Crashes

Facility Type	Fatal (K) Crashes (crashes)	Incapacitating Injury (A) Crashes (crashes)	Non-Incapacitating Injury (B) Crashes (crashes)	Possible Injury (C) Crashes (crashes)	No Injury (O) Crashes (crashes)	Total Crashes (crashes)
Rural Two-Lane Intersection	0.1202	0.4614	1.2941	1.1437	6.8479	9.8672
Total	0.1202	0.4614	1.2941	1.1437	6.8479	9.8672

STH 21 & CTH FF Roundabout Data

Case Title: STH 21 & CTH FF Roundabout
Is Base Case: false
Present Value of Crash Cost: 698,966.63
Present Value of Other Cost: 950,000.00

Table 16. STH 21 & CTH FF Roundabout Evaluation Cost

Project or Interchange	Selected Facility	Selected Evaluation	Present Value of Crash Cost ($)
6180-30-00, STH 21 from STH 116 to Leonard Point	CTH FF Intersection Single Lane Roundabout	CTH FF Crash Prediction Roundabout	698,966.63
Total			698,966.63

Table 17. STH 21 & CTH FF Roundabout Evaluation Crashes

Project or Interchange	Selected Facility	Selected Evaluation	Fatal (K) Crashes (crashes)	Incapacitating Injury (A) Crashes (crashes)	Non-Incapacitating Injury (B) Crashes (crashes)	Possible Injury (C) Crashes (crashes)	No Injury (O) Crashes (crashes)	Total Crashes (crashes)
6180-30-00, STH 21 from STH 116 to Leonard Point	CTH FF Intersection Single Lane Roundabout	CTH FF Crash Prediction Roundabout	0.0178	0.1766	1.1362	1.0295	15.6510	18.0111
Total			0.0178	0.1766	1.1362	1.0295	15.6510	18.0111

Table 18. CTH FF Intersection Single Lane Roundabout Facility Type Crashes

Facility Type	Fatal (K) Crashes (crashes)	Incapacitating Injury (A) Crashes (crashes)	Non-Incapacitating Injury (B) Crashes (crashes)	Possible Injury (C) Crashes (crashes)	No Injury (O) Crashes (crashes)	Total Crashes (crashes)
Roundabout	0.0178	0.1766	1.1362	1.0295	15.6510	18.0111
Total	0.0178	0.1766	1.1362	1.0295	15.6510	18.0111

Evaluation Message

Interactive Highway Safety Design Model

Economic Analysis Report

STH 21 & Sand Pit Road

August 6, 2020

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Economic Analysis Report

Economic Analysis Report Overview

Report Generated: Aug 6, 2020 10:05 AM
Report Template: System: Multi-Page [System] (eam2, Jan 20, 2020 2:20 PM)

Evaluation Title: EAAnalysis 4 Updated 8/6/2020
Evaluation Comment: Created Thu Aug 06 10:04:25 CDT 2020
Evaluation Date: Thu Aug 06 10:04:44 CDT 2020

User Name: Scott Nelson
Organization Name: WisDOT NE Region
Phone: 920.366.2109
E-Mail: scott.nelson@dot.wi.gov

Project Title: 6180-30-00, STH 21 & Sand Pit Road Evaluation
Project Comment: Created Wed Jul 01 16:09:50 CDT 2020

Configuration Summary

Crash Cost Configuration: WisDOT Economics_v15-0
Configuration Comment: WisDOT Crash Costs

Table 1. Economic Analysis Configuration

Configuration Data	
Crash Unit Cost Zero Year	**2016**
Crash Cost Index	**0.00**
Discount Rate	**0.03**
KABCO Unit Costs	
K Cost ($/Crash)	**10,897,580.00**
A Cost ($/Crash)	**613,781.00**
B Cost ($/Crash)	**194,022.00**
C Cost ($/Crash)	**110,830.00**
O Cost ($/Crash)	**10,173.00**

Table 2. RTL Segment FI Proportion Data

Segment Type	Fatal Crash (K) Proportion of FI (%)	Incapacitating Injury Crash (A) Proportion of FI (%)	Non-incapacitating Injury Crash (B) Proportion of FI (%)	Possible Injury Crash (C) Proportion of FI (%)
Two-Lane Undivided	3.502	12.638	43.370	40.490

Table 3. RTL Intersection FI Proportion Data

Intersection Type	Fatal Crash (K) Proportion of FI (%)	Incapacitating Injury Crash (A) Proportion of FI (%)	Non-incapacitating Injury Crash (B) Proportion of FI (%)	Possible Injury Crash (C) Proportion of FI (%)
Three-Legged w/STOP control	3.070	15.070	42.380	39.480
Four-Legged w/STOP control	3.980	15.280	42.860	37.880
Four-Legged Signalized	2.960	11.750	35.290	50.000

Table 4. RML Segment FI Proportion Data

Segment Type	Fatal Crash (K) Proportion of FI (%)	Incapacitating Injury Crash (A) Proportion of FI (%)	Non-incapacitating Injury Crash (B) Proportion of FI (%)	Possible Injury Crash (C) Proportion of FI (%)
Four-Lane Undivided	3.502	12.638	43.370	40.490
Four-Lane Divided	3.502	12.638	43.370	40.490

Table 5. RML Intersection FI Proportion Data

Intersection Type	Fatal Crash (K) Proportion of FI (%)	Incapacitating Injury Crash (A) Proportion of FI (%)	Non-incapacitating Injury Crash (B) Proportion of FI (%)	Possible Injury Crash (C) Proportion of FI (%)
Three-Legged w/STOP control	4.090	14.090	40.630	41.190
Four-Legged w/STOP control	4.710	15.910	41.990	37.390
Four-Legged Signalized	0.600	10.010	37.180	52.210

Table 6. USA Segment FI Proportion Data

Segment Type	Fatal Crash (K) Proportion of FI (%)	Incapacitating Injury Crash (A) Proportion of FI (%)	Non-incapacitating Injury Crash (B) Proportion of FI (%)	Possible Injury Crash (C) Proportion of FI (%)
Two-Lane Undivided	1.012	5.785	33.011	60.192
Three-Lane w/Center TWLTL	1.012	5.785	33.011	60.192
Four-Lane Undivided	1.012	5.785	33.011	60.192
Four-Lane Divided	1.012	5.785	33.011	60.192
Five-Lane w/Center TWLTL	1.012	5.785	33.011	60.192

Table 7. USA Intersection FI Proportion Data

Intersection Type	Fatal Crash (K) Proportion of FI (%)	Incapacitating Injury Crash (A) Proportion of FI (%)	Non-incapacitating Injury Crash (B) Proportion of FI (%)	Possible Injury Crash (C) Proportion of FI (%)
Three-Legged w/STOP control	0.744	6.558	36.725	55.973
Three-Legged Signalized	0.451	4.957	32.024	62.568
Four-Legged w/STOP control	0.864	6.637	38.161	54.338
Four-Legged Signalized	0.715	5.263	32.359	61.663

Analysis Output Summary

Analysis Type: Benefit/Cost

Table 8. Case Cost Summary

Is Base Case	Title	Present Value of Crash Cost ($)	Present Value of Other Cost ($)	Net Present Value of Benefits (B) ($)	Net Present Value of Costs (C) ($)	Present Value of Net Benefit (B-C) ($)	Benefit Cost Ratio (B/C)
Yes	Sand Pit Overylay & Concrete Repair	2,917,076.43	170,000.00				
	Sand Pit STH 21 Left Turn Lanes	1,516,879.75	720,000.00	1,400,196.68	550,000.00	850,196.68	2.5458
	Sand Pit Road Roundabout	809,019.74	900,000.00	2,108,056.68	730,000.00	1,378,056.68	2.8878

Table 9. Case Crash Summary

Is Base Case	Title	Fatal (K) Crashes (crashes)	Incapacitating Injury (A) Crashes (crashes)	Non-Incapacitating Injury (B) Crashes (crashes)	Possible Injury (C) Crashes (crashes)	No Injury (O) Crashes (crashes)	Total Crashes (crashes)
Yes	Sand Pit Overylay & Concrete Repair	0.1957	0.7514	2.1077	1.8628	11.1530	16.0705
	Sand Pit STH 21 Left Turn Lanes	0.1018	0.3907	1.0960	0.9686	5.7995	8.3567
	Sand Pit Road Roundabout	0.0191	0.1897	1.2204	1.5359	18.6452	21.6102

Crash Cost Data

Sand Pit Overylay & Concrete Repair Data

Case Title: Sand Pit Overylay & Concrete Repair
Is Base Case: true
Present Value of Crash Cost: 2,917,076.43
Present Value of Other Cost: 170,000.00

Table 10. Sand Pit Overylay & Concrete Repair Evaluation Cost

Project or Interchange	Selected Facility	Selected Evaluation	Present Value of Crash Cost ($)
6180-30-00, STH 21 from STH 116 to Leonard Point	Sand Pit Road Intersection Overlay & Concrete Repair	Sand Pit Predicted Crashes Overlay and Concrete Repair	2,917,076.43
Total			2,917,076.43

Table 11. Sand Pit Overylay & Concrete Repair Evaluation Crashes

Project or Interchange	Selected Facility	Selected Evaluation	Fatal (K) Crashes (crashes)	Incapacitating Injury (A) Crashes (crashes)	Non-Incapacitating Injury (B) Crashes (crashes)	Possible Injury (C) Crashes (crashes)	No Injury (O) Crashes (crashes)	Total Crashes (crashes)
6180-30-00, STH 21 from STH 116 to Leonard Point	Sand Pit Road Intersection Overlay & Concrete Repair	Sand Pit Predicted Crashes Overlay and Concrete Repair	0.1957	0.7514	2.1077	1.8628	11.1530	16.0705
Total			0.1957	0.7514	2.1077	1.8628	11.1530	16.0705

Table 12. Sand Pit Road Intersection Overlay & Concrete Repair Facility Type Crashes

Facility Type	Fatal (K) Crashes (crashes)	Incapacitating Injury (A) Crashes (crashes)	Non-Incapacitating Injury (B) Crashes (crashes)	Possible Injury (C) Crashes (crashes)	No Injury (O) Crashes (crashes)	Total Crashes (crashes)
Rural Two-Lane Intersection	0.1957	0.7514	2.1077	1.8628	11.1530	16.0705
Total	0.1957	0.7514	2.1077	1.8628	11.1530	16.0705

Sand Pit STH 21 Left Turn Lanes Data

Case Title: Sand Pit STH 21 Left Turn Lanes
Is Base Case: false
Present Value of Crash Cost: 1,516,879.75
Present Value of Other Cost: 720,000.00

Table 13. Sand Pit STH 21 Left Turn Lanes Evaluation Cost

Project or Interchange	Selected Facility	Selected Evaluation	Present Value of Crash Cost ($)
6180-30-00, STH 21 from STH 116 to Leonard Point	Sand Pit Road Intersection STH 21 Left Turn Lanes	Sand Pit Predicted Crashes Left Turn Lanes	1,516,879.75
Total			1,516,879.75

Table 14. Sand Pit STH 21 Left Turn Lanes Evaluation Crashes

Project or Interchange	Selected Facility	Selected Evaluation	Fatal (K) Crashes (crashes)	Incapacitating Injury (A) Crashes (crashes)	Non-Incapacitating Injury (B) Crashes (crashes)	Possible Injury (C) Crashes (crashes)	No Injury (O) Crashes (crashes)	Total Crashes (crashes)
6180-30-00, STH 21 from STH 116 to Leonard Point	Sand Pit Road Intersection STH 21 Left Turn Lanes	Sand Pit Predicted Crashes Left Turn Lanes	0.1018	0.3907	1.0960	0.9686	5.7995	8.3567
Total			0.1018	0.3907	1.0960	0.9686	5.7995	8.3567

Table 15. Sand Pit Road Intersection STH 21 Left Turn Lanes Facility Type Crashes

Facility Type	Fatal (K) Crashes (crashes)	Incapacitating Injury (A) Crashes (crashes)	Non-Incapacitating Injury (B) Crashes (crashes)	Possible Injury (C) Crashes (crashes)	No Injury (O) Crashes (crashes)	Total Crashes (crashes)
Rural Two-Lane Intersection	0.1018	0.3907	1.0960	0.9686	5.7995	8.3567
Total	0.1018	0.3907	1.0960	0.9686	5.7995	8.3567

Sand Pit Road Roundabout Data

Case Title: Sand Pit Road Roundabout
Is Base Case: false
Present Value of Crash Cost: 809,019.74
Present Value of Other Cost: 900,000.00

Table 16. Sand Pit Road Roundabout Evaluation Cost

Project or Interchange	Selected Facility	Selected Evaluation	Present Value of Crash Cost ($)
6180-30-00, STH 21 from STH 116 to Leonard Point	Sand Pit Road Intersection Roundabout	Sand Pit Predicted Crashes Roundabout	809,019.74
Total			809,019.74

Table 17. Sand Pit Road Roundabout Evaluation Crashes

Project or Interchange	Selected Facility	Selected Evaluation	Fatal (K) Crashes (crashes)	Incapacitating Injury (A) Crashes (crashes)	Non-Incapacitating Injury (B) Crashes (crashes)	Possible Injury (C) Crashes (crashes)	No Injury (O) Crashes (crashes)	Total Crashes (crashes)
6180-30-00, STH 21 from STH 116 to Leonard Point	Sand Pit Road Intersection Roundabout	Sand Pit Predicted Crashes Roundabout	0.0191	0.1897	1.2204	1.5359	18.6452	21.6102
Total			0.0191	0.1897	1.2204	1.5359	18.6452	21.6102

Table 18. Sand Pit Road Intersection Roundabout Facility Type Crashes

Facility Type	Fatal (K) Crashes (crashes)	Incapacitating Injury (A) Crashes (crashes)	Non-Incapacitating Injury (B) Crashes (crashes)	Possible Injury (C) Crashes (crashes)	No Injury (O) Crashes (crashes)	Total Crashes (crashes)
Roundabout	0.0191	0.1897	1.2204	1.5359	18.6452	21.6102
Total	0.0191	0.1897	1.2204	1.5359	18.6452	21.6102

Evaluation Message

Wisconsin Department of Transportation Traffic Signal Warrant Summary Worksheet

70%

The Worksheet(s) attached are provided as an attachment to the Engineering Investigation Study for:

Intersection: WIS 21 & Reighmoor Road
County: Winnebago
Select one:

Major Street: WIS 21
Critical Approach Speed: 55 mph
Lanes: 1 lane

Minor Street: Reighmoor Road
Critical Approach Speed: 55 mph
Lanes: 1 lane

% Right Turns Included
From North (SB) 100%
From East (WB) 0%
From South (NB) 100%
From West (EB) 0%

In built-up area of isolated community of < 10,000 population? No
Total number of approaches at intersection? 4 or more
If it is a "T" intersection, inflate minor threshold to 150%? No
Manually set volume level? No

Analysis based on EXISTING volume data.

Date	Day of the Week	Time (HH:MM)			
		From	AM / PM	To	AM / PM
1/16/2020	Thursday	6:00	AM	6:00	PM

Warrant Evaluation Summary	Warrant Met:
Warrant 1: Eight - Hour Vehicular Volume	**No**
Condition A: Minimum Vehicular Volume	No
Condition B: Interruption of Continuous Traffic	No
Condition C: Combination: 80% of A and B	No
Warrant 2: Four-Hour Volume	**No**
Warrant 3: Peak Hour Volume	**N/A**
Warrant 4: Pedestrian Volume	**N/A**
Criterion A: Four-Hour	
Criterion B: Peak-Hour	
Warrant 5: School Crossing	**N/A**
Warrant 6: Coordinated Signal System	**N/A**
Warrant 7: Crash Experience	**N/A**
Warrant 8: Roadway Network	**N/A**
Warrant 9: Intersection Near a Grade Crossing	**N/A**

Warrant Analysis Conducted By:

Name: Randy Asman
Agency: WisDOT

Date: 1/23/2020

Warrant 1: Eight - Hour Vehicular Volume 70%

Warrant Evaluated? Yes **Warrant Satisfied? No** **Manually Set To: No**

Condition A : Min. Veh. Volume		
Volume Level	70%	56%
Major Rd. Req	350	280
Minor Rd. Req	105	84
Number of Hours	0	0

Satisfied? No

Condition B: Interruption of Continuous Traffic		
Volume Level	70%	56%
Major Rd. Req	525	420
Minor Rd. Req	53	42
Number of Hours	2	5

Satisfied? No

Condition C: Combination of A & B at 56%

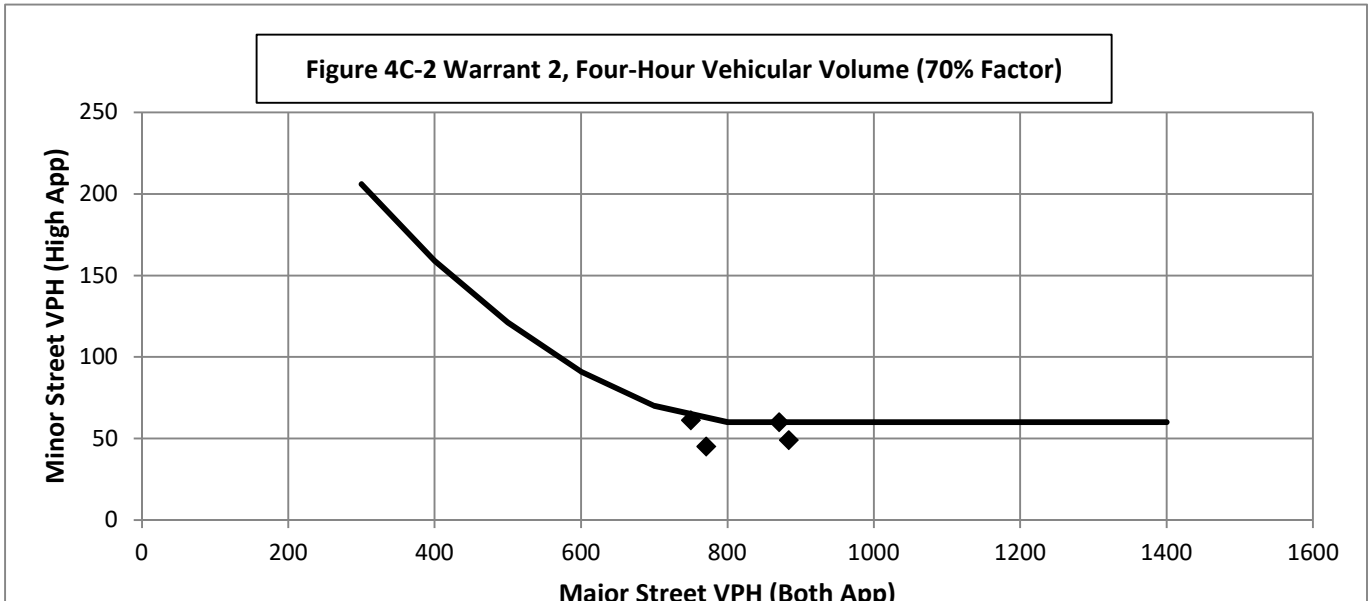
Satisfied? No

6:00 AM		Enter Start Time (Military Time) (HH:MM)			
Time Period	**From**	**To**	**Major Road: Both App. (VPH)**	**Minor Road: High App. (VPH)**	**Total**
1	6:00	7:00	536	38	574
2	7:00	8:00	750	61	811
3	8:00	9:00	488	30	518
4	9:00	10:00	469	19	488
5	10:00	11:00	479	19	498
6	11:00	12:00	505	25	530
7	12:00	13:00	563	28	591
8	13:00	14:00	561	25	586
9	14:00	15:00	671	48	719
10	15:00	16:00	884	49	933
11	16:00	17:00	871	60	931
12	17:00	18:00	771	45	816
13	18:00	19:00	0	0	0
14	19:00	20:00	0	0	0
15	20:00	21:00	0	0	0
16	21:00	22:00	0	0	0

Warrant 2: Four-Hour Volume 70%

Warrant Evaluated? Yes
Warrant Satisfied? No
Manually Set To: No

Hour Start	16:00	7:00	15:00	17:00
Major Road Vol.	871	750	884	771
Minor Road Vol.	60	61	49	45



Major Street VFH (Both App)

Warrant 3: Peak Hour Volume 70%

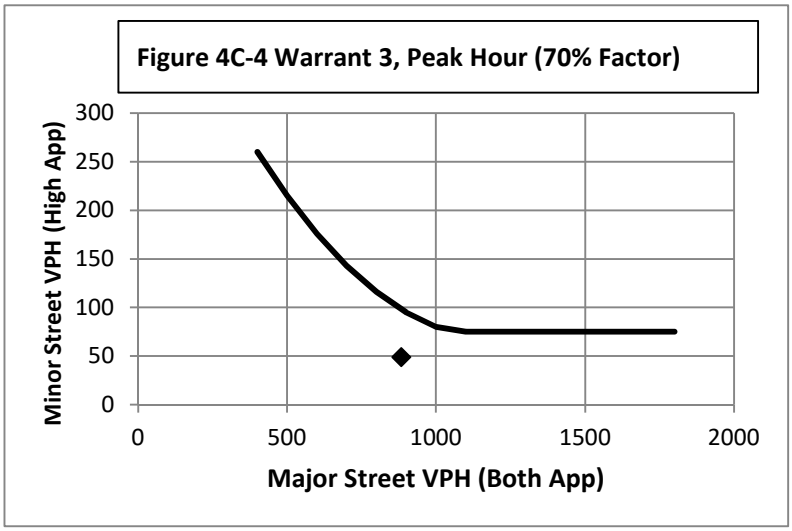
Warrant Evaluated? **Warrant Satisfied? N/A** **Manually Set To:**

Condition justifying use of warrant:

Criteria		Met?
Delay on Minor Approach	4	
Volume on Minor Approach	100	
Total Entering Volume (veh/h)	800	

Manually Set Peak Hour?

Peak Hour	Major Road Vol. (Both App.)	Minor Road Vol. (High App.)
15:00	884	49



Warrant 4: Pedestrian Volume 70%

Warrant Evaluated? **Warrant Satisfied? N/A** **Manually Set To:**

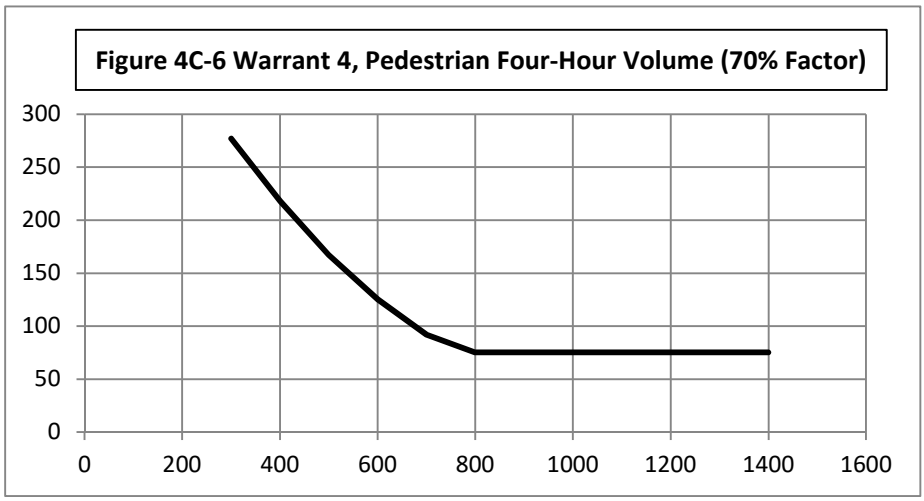
Criterion A: Four Hour

Hour (Start)	Pedestrian Volume	Major Road Vol.
		0
		0
		0
		0

Manually Set Major Rd Vol?

Avg. walk speed less than 3.5 ft/s?

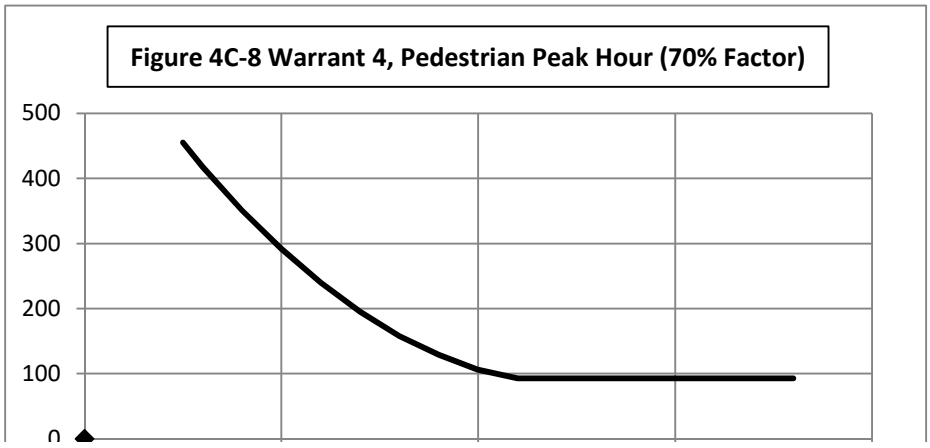
Criterion A Satisfied?

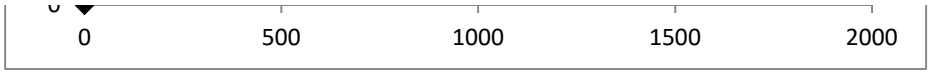


Criterion B: Peak Hour

Peak Hour	Pedestrian Vol.	Major Road Vol.
0:00	0	0

Criterion B Satisfied?




0
0
500
1000
1500
2000

Warrant 5: School Crossing 70%

Warrant Evaluated? **Warrant Satisfied? N/A** **Manually Set To:**

	Criteria	Fulfilled?
1	There are a MINIMUM of 20 school children during the highest crossing hour.	
2	There are fewer adequate gaps in the major road traffic stream during the period when the school children are using the crossing than the number of minutes in the same period.	
3	The nearest traffic signal along the major road is located more than 300 ft away. Or, the nearest traffic signal is within 300 ft but the proposed traffic signal will not restrict the progressive movement of traffic.	

Warrant 6: Coordinated Signal System 70%

Warrant Evaluated? **Warrant Satisfied? N/A** **Manually Set To:**

	Criteria	Fulfilled?
1	Signal spacing > 1000 ft	
2	On a one-way road or a road that has traffic predominantly in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.	
3	On a two-way road, adjacent signals do not provide the necessary degree of platooning and the proposed and the adjacent signals will collectively provide a progressive operation.	

Warrant 7: Crash Experience 70%

Warrant Evaluated? **Warrant Satisfied? N/A** **Manually Set To:**

	Criteria		Met?	Fulfilled?
1	Adequate trial of other remedial measures has failed to reduce crash frequency.			
	Measures Tried:			
2	Five or more reported crashes, of types susceptible to correction by signal, have occurred within a 12 month period.	# of crashes per 12 months		
3	Warrant 1, Condition A (80%)		No	No
	Warrant 1, Condition B (80%)		No	
	Warrant 4, Criterion A (80%)		No	
	Warrant 4, Criterion B (80%)		No	

Warrant 8: Roadway Network 70%

Warrant Evaluated? **Warrant Satisfied? N/A** **Manually Set To:**

	Criteria					Met?	Fulfilled?
1	Total entering volume of at least 1,000 veh/h during typical weekday peak hour				933	No	No
	Five-year projected volumes that satisfy one or more of Warrants 1, 2, or 3.					No	
2	Total entering vol. of at least 1,000 veh/h for each of any 5 hrs of non-normal business day (Sat. or Sun.)						
	Hour						
	Volume						

	Characteristics of Major Routes - Select yes if all intersecting routes have characteristic	Fulfilled?
1	Part of the road or highway system that serves as the principal roadway network for through traffic flow	

2	Rural or suburban highway outside of, entering, or traversing a city	
3	Appears as a major route on an official plan	

Warrant 9: Intersection Near a Grade Crossing 70%

Warrant Evaluated? **Warrant Satisfied? N/A** **Manually Set To:**

Adjustment Factors			Manually Set Peak Hour?				
Rail Traffic per Day	% High Occupancy Buses on Minor Road	% Tractor-Trailer Trucks on Minor Road	D	Peak Hour	Major Road Vol.	Minor Road Vol.	Adjusted Minor Vol.
1	0	0% to 2.5%	660	15:00	884	49	16.415

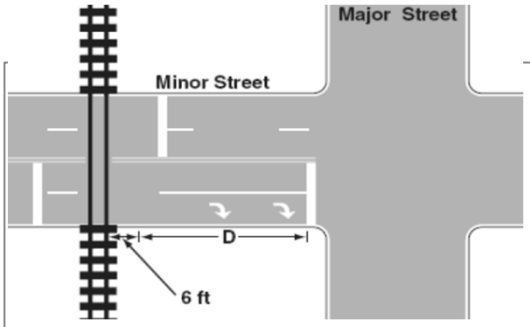
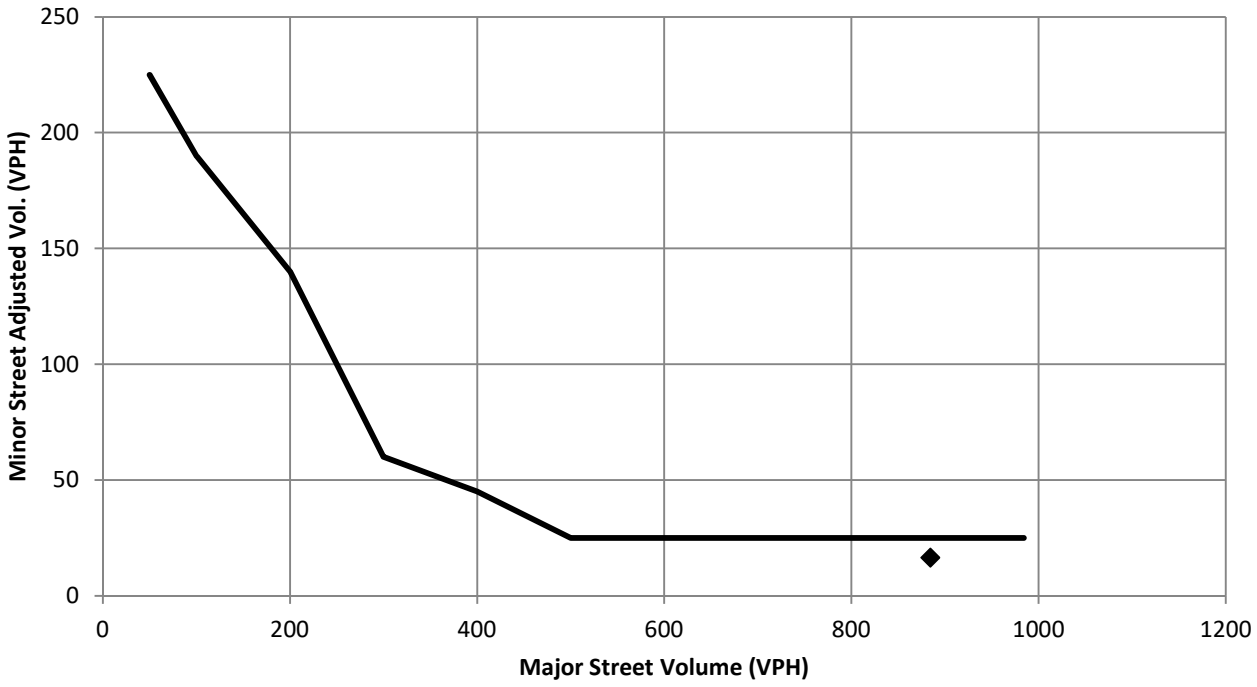


Figure 4C-9 Warrant9, Intersection Near a grade Crossing (One Approach Lane at the Track Crossing)



Conclusions/Comments:

HCS7 Two-Way Stop-Control Report

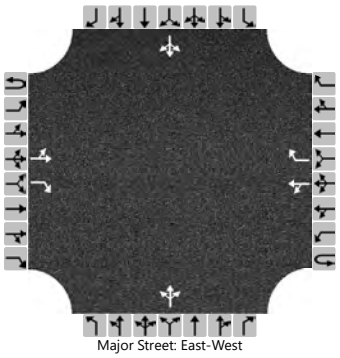
General Information

Analyst	CRF
Agency/Co.	Westwood
Date Performed	01/21/2021
Analysis Year	2027
Time Analyzed	AM Peak Existing Geometry
Intersection Orientation	East-West
Project Description	STH 21, Omro - Oshkosh

Site Information

Intersection	STH 21 and CTH FF
Jurisdiction	WisDOT NE
East/West Street	STH 21
North/South Street	CTH FF (Reighmoor Rd)
Peak Hour Factor	0.93
Analysis Time Period (hrs)	0.25

Lanes


Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	1	0	0	1	1		0	1	0		0	1	0
Configuration		LT		R		LT		R			LTR				LTR	
Volume (veh/h)		5	482	22		16	270	3		16	4	46		22	14	14
Percent Heavy Vehicles (%)		3				3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized		No				No										
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.13				4.13				7.13	6.53	6.23		7.13	6.53	6.23
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		5				17					71				54	
Capacity, c (veh/h)		1262				1022					410				304	
v/c Ratio		0.00				0.02					0.17				0.18	
95% Queue Length, Q_{95} (veh)		0.0				0.1					0.6				0.6	
Control Delay (s/veh)		7.9				8.6					15.6				19.4	
Level of Service (LOS)		A				A					C				C	
Approach Delay (s/veh)		0.1				0.6				15.6				19.4		
Approach LOS										C				C		

HCS7 Two-Way Stop-Control Report

General Information

Analyst	CRF
Agency/Co.	Westwood
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Site Information

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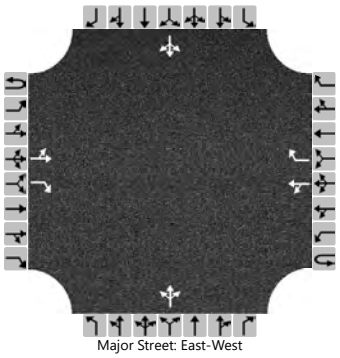
Jurisdiction	WisDOT NE
East/West Street	STH 21
North/South Street	CTH FF (Reighmoor Rd)
Peak Hour Factor	0.93
Analysis Time Period (hrs)	0.25

Lanes


Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	1	0	0	1	1		0	1	0		0	1	0
Configuration		LT		R		LT		R			LTR				LTR	
Volume (veh/h)		15	379	30		23	512	25		21	9	21		10	3	12
Percent Heavy Vehicles (%)		3				3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized		No				No										
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.13				4.13				7.13	6.53	6.23		7.13	6.53	6.23
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		16				25					55				27	
Capacity, c (veh/h)		991				1115					270				267	
v/c Ratio		0.02				0.02					0.20				0.10	
95% Queue Length, Q_{95} (veh)		0.0				0.1					0.7				0.3	
Control Delay (s/veh)		8.7				8.3					21.7				20.0	
Level of Service (LOS)		A				A					C				C	
Approach Delay (s/veh)		0.5				0.6				21.7				20.0		
Approach LOS										C				C		

HCS7 Two-Way Stop-Control Report

General Information

Analyst	CRF
Agency/Co.	Westwood
Date Performed	01/21/2021
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Project Description	STH 21, Omro - Oshkosh

Site Information

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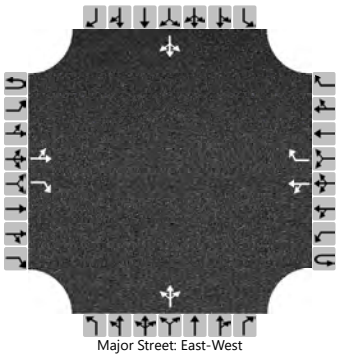
Jurisdiction	WisDOT NE
East/West Street	STH 21
North/South Street	CTH FF (Reighmoor Rd)
Peak Hour Factor	0.93
Analysis Time Period (hrs)	0.25

Lanes


Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	1	0	0	1	1		0	1	0		0	1	0
Configuration		LT		R		LT		R			LTR				LTR	
Volume (veh/h)		9	518	33		16	287	3		30	4	46		22	15	29
Percent Heavy Vehicles (%)		3				3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized		No				No										
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.13				4.13				7.13	6.53	6.23		7.13	6.53	6.23
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		10				17					86				71	
Capacity, c (veh/h)		1243				978					330				318	
v/c Ratio		0.01				0.02					0.26				0.22	
95% Queue Length, Q_{95} (veh)		0.0				0.1					1.0				0.8	
Control Delay (s/veh)		7.9				8.7					19.7				19.6	
Level of Service (LOS)		A				A					C				C	
Approach Delay (s/veh)		0.2				0.6				19.7				19.6		
Approach LOS										C				C		

HCS7 Two-Way Stop-Control Report

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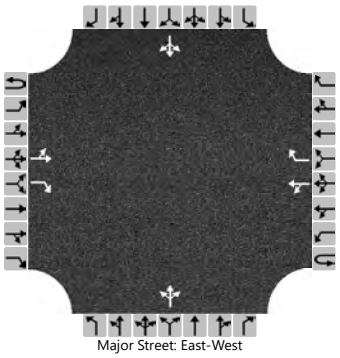
East/West Street	STH 21
North/South Street	CTH FF (Reighmoor Rd)
Peak Hour Factor	0.93
Analysis Time Period (hrs)	0.25

Lanes


Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	1	0	0	1	1		0	1	0		0	1	0
Configuration		LT		R		LT		R			LTR				LTR	
Volume (veh/h)		30	401	42		23	558	25		35	9	21		10	3	20
Percent Heavy Vehicles (%)		3				3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized		No				No										
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.13				4.13				7.13	6.53	6.23		7.13	6.53	6.23
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		32				25					70				35	
Capacity, c (veh/h)		950				1081					204				260	
v/c Ratio		0.03				0.02					0.34				0.14	
95% Queue Length, Q_{95} (veh)		0.1				0.1					1.4				0.5	
Control Delay (s/veh)		8.9				8.4					31.5				21.0	
Level of Service (LOS)		A				A					D				C	
Approach Delay (s/veh)		0.9				0.6				31.5				21.0		
Approach LOS										D				C		

HCS7 Two-Way Stop-Control Report

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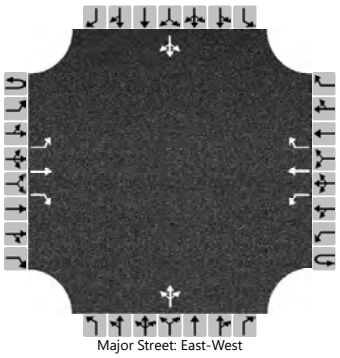
East/West Street	STH 21
North/South Street	CTH FF (Reighmoor Rd)
Peak Hour Factor	0.93
Analysis Time Period (hrs)	0.25

Lanes


Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	1	0	1	1	1		0	1	0		0	1	0
Configuration		L	T	R		L	T	R			LTR				LTR	
Volume (veh/h)		5	482	22		16	270	3		16	4	46		22	14	14
Percent Heavy Vehicles (%)		3				3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized		No				No										
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.13				4.13				7.13	6.53	6.23		7.13	6.53	6.23
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		5				17					71				54	
Capacity, c (veh/h)		1262				1022					411				305	
v/c Ratio		0.00				0.02					0.17				0.18	
95% Queue Length, Q_{95} (veh)		0.0				0.1					0.6				0.6	
Control Delay (s/veh)		7.9				8.6					15.6				19.3	
Level of Service (LOS)		A				A					C				C	
Approach Delay (s/veh)		0.1				0.6				15.6				19.3		
Approach LOS										C				C		

HCS7 Two-Way Stop-Control Report

General Information

Analyst	CRF
Agency/Co.	Westwood
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Time Analyzed	PM Peak, LTLs
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Project Description	STH 21, Omro - Oshkosh

Site Information

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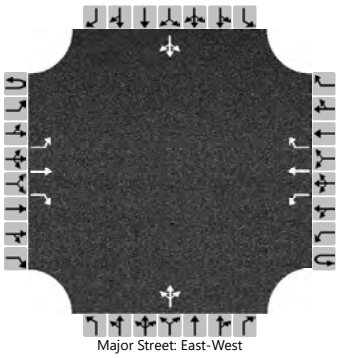
East/West Street	STH 21
North/South Street	CTH FF (Reighmoor Rd)
Peak Hour Factor	0.93
Analysis Time Period (hrs)	0.25

Lanes


Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	1	0	1	1	1		0	1	0		0	1	0
Configuration		L	T	R		L	T	R			LTR				LTR	
Volume (veh/h)		15	379	30		23	512	25		21	9	21		10	3	12
Percent Heavy Vehicles (%)		3				3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized		No				No										
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.13				4.13				7.13	6.53	6.23		7.13	6.53	6.23
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		16				25					55				27	
Capacity, c (veh/h)		991				1115					273				269	
v/c Ratio		0.02				0.02					0.20				0.10	
95% Queue Length, Q_{95} (veh)		0.0				0.1					0.7				0.3	
Control Delay (s/veh)		8.7				8.3					21.5				19.8	
Level of Service (LOS)		A				A					C				C	
Approach Delay (s/veh)		0.4				0.5				21.5				19.8		
Approach LOS										C				C		

HCS7 Two-Way Stop-Control Report

General Information

Analyst	CRF
Agency/Co.	Westwood
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Time Analyzed	AM Peak, LTLs
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Site Information

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East/West Street	STH 21
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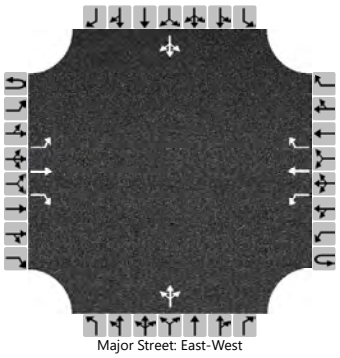
Peak Hour Factor	0.93
Analysis Time Period (hrs)	0.25

Lanes


Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	1	0	1	1	1		0	1	0		0	1	0
Configuration		L	T	R		L	T	R			LTR				LTR	
Volume (veh/h)		9	518	33		16	287	3		30	4	46		22	15	29
Percent Heavy Vehicles (%)		3				3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized		No				No										
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.13				4.13				7.13	6.53	6.23		7.13	6.53	6.23
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		10				17					86				71	
Capacity, c (veh/h)		1243				978					331				319	
v/c Ratio		0.01				0.02					0.26				0.22	
95% Queue Length, Q_{95} (veh)		0.0				0.1					1.0				0.8	
Control Delay (s/veh)		7.9				8.7					19.7				19.5	
Level of Service (LOS)		A				A					C				C	
Approach Delay (s/veh)		0.2				0.6				19.7				19.5		
Approach LOS										C				C		

HCS7 Two-Way Stop-Control Report

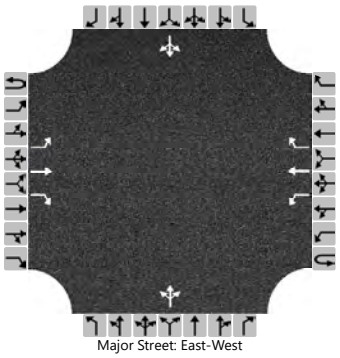
General Information

Analyst	CRF
Agency/Co.	Westwood
Date Performed	01/21/2021
Analysis Year	2047
Time Analyzed	PM Peak, LTLs
Intersection Orientation	East-West
Project Description	STH 21, Omro - Oshkosh

Site Information

Intersection	STH 21 and CTH FF
Jurisdiction	WisDOT NE
East/West Street	STH 21
North/South Street	CTH FF (Reighmoor Rd)
Peak Hour Factor	0.93
Analysis Time Period (hrs)	0.25

Lanes


Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	1	0	1	1	1		0	1	0		0	1	0
Configuration		L	T	R		L	T	R			LTR				LTR	
Volume (veh/h)		30	401	42		23	558	25		35	9	21		10	3	20
Percent Heavy Vehicles (%)		3				3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized		No				No										
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.13				4.13				7.13	6.53	6.23		7.13	6.53	6.23
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

Delay, Queue Length, and Level of Service

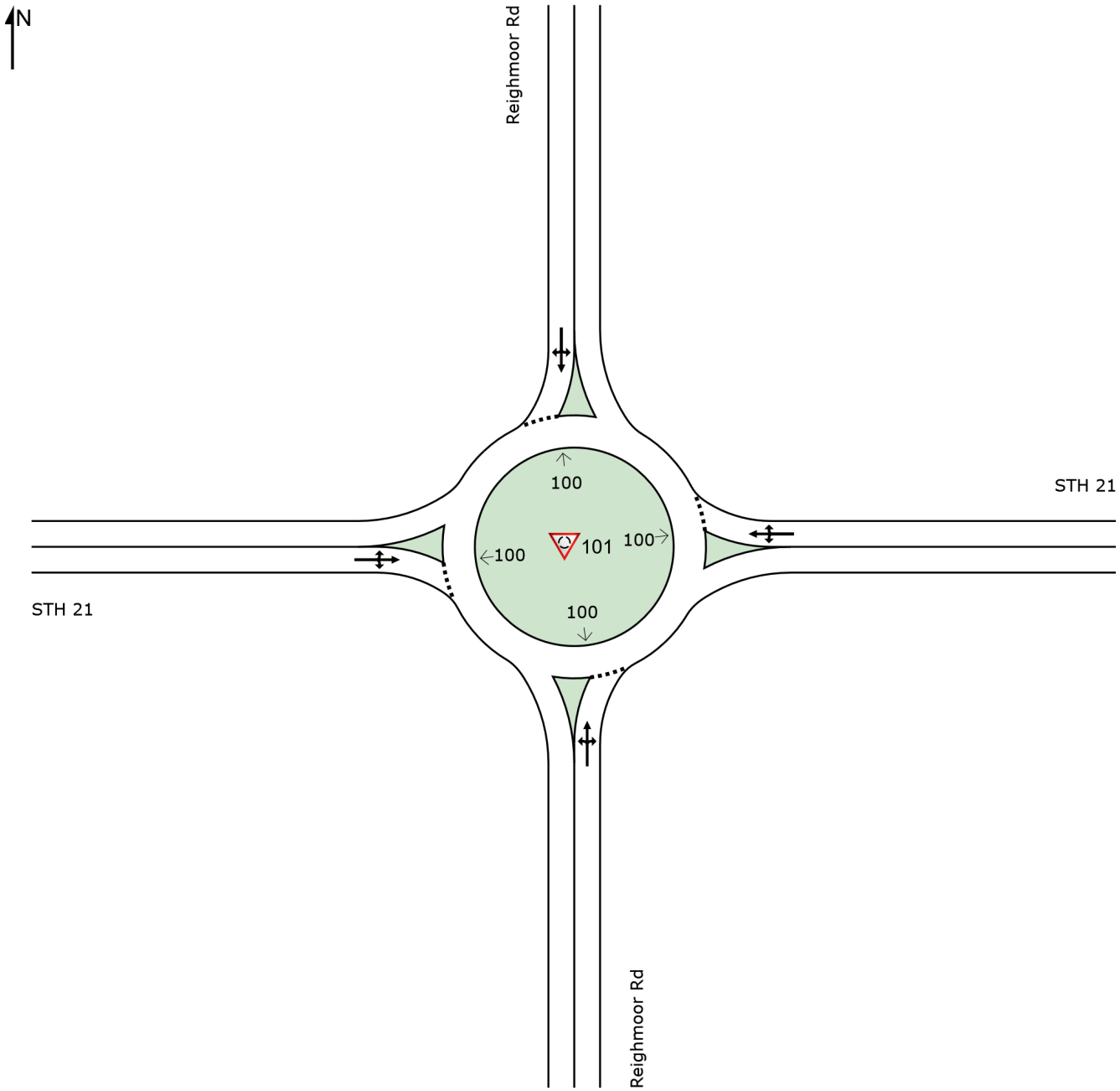
Flow Rate, v (veh/h)		32				25					70				35	
Capacity, c (veh/h)		950				1081					208				263	
v/c Ratio		0.03				0.02					0.34				0.13	
95% Queue Length, Q_{95} (veh)		0.1				0.1					1.4				0.5	
Control Delay (s/veh)		8.9				8.4					30.9				20.8	
Level of Service (LOS)		A				A					D				C	
Approach Delay (s/veh)		0.8				0.5				30.9				20.8		
Approach LOS										D				C		

SITE LAYOUT

Site: 101 [AM 2027 Reighmoor (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT FLOWS FOR SITE (INPUT)

Approach movement input flow rates (veh/h)

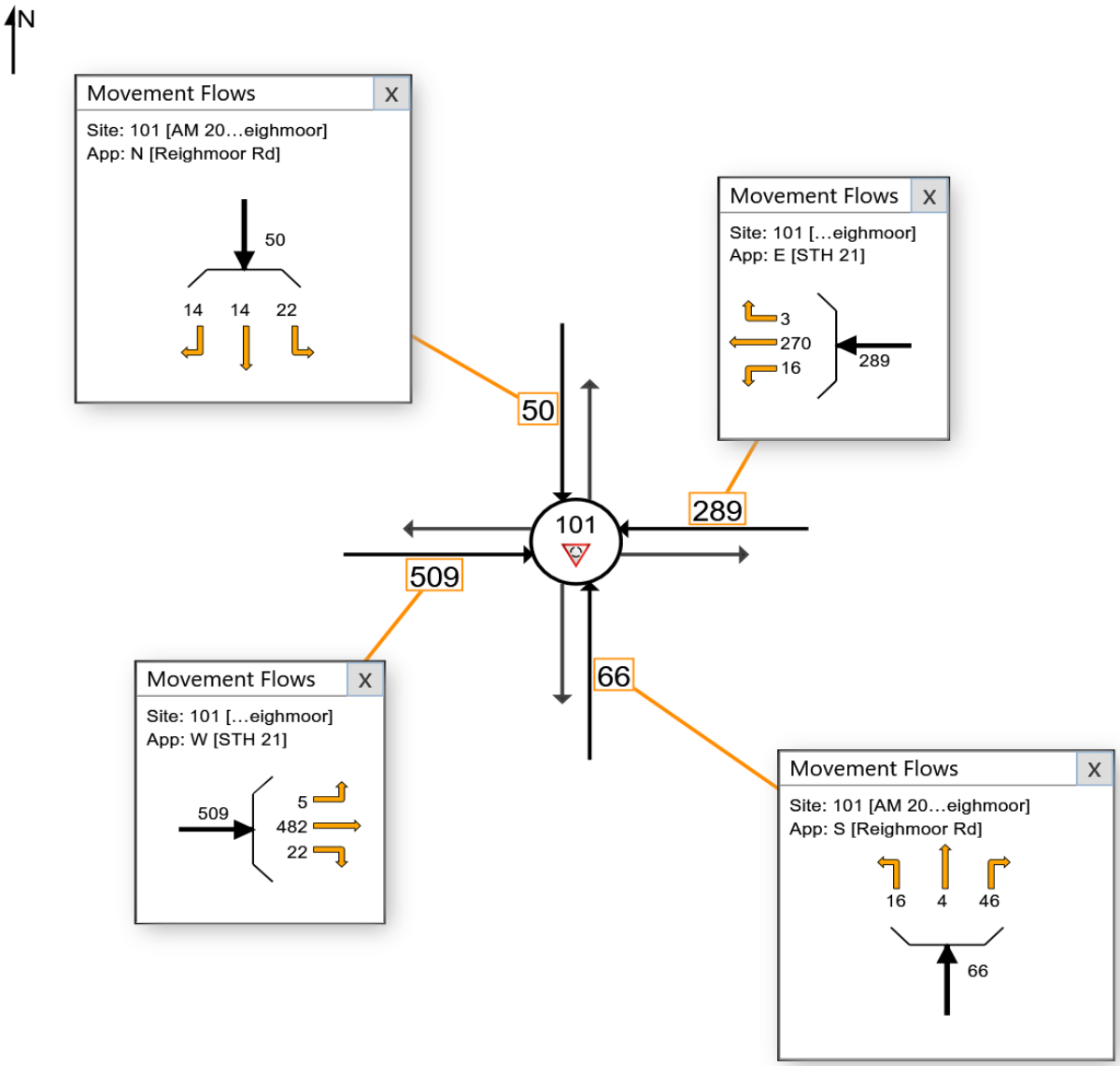
All Movement Classes

Site: 101 [AM 2027 Reighmoor (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
Click and drag popup boxes to move to preferred positions.

Close All Popups



INPUT COMPARISON

Site A: 101 [AM 2027 Reighmoor (Site Folder: General)]

Site B:

Intersection - Site Data

SITE	AM 2027 Reighmoor	Defaults - US HCM (Customary)
No Difference		

Intersection - Site Properties

SITE	AM 2027 Reighmoor	Defaults - US HCM (Customary)
NA		

Intersection - Approach & Exit Data

SITE	Location	Name	Type	No. of App. Lanes	No. of Exit Lanes	Approach Distance ft	Extra Bunching (Site Analysis) %	Extra Bunching (Network Analysis) %	Exit Distance ft	Approach Control	Area Type Factor
AM 2027 Reighmoor	South	Reighmoor Rd	Two Way	1	1	1600.0	0	-	-	Yield	-
Defaults - US HCM (Customary)	South	RoadName	Two Way	1	1	1600.0	0	-	-	Yield	-
AM 2027 Reighmoor	East	STH 21	Two Way	1	1	1600.0	0	-	-	Yield	-
Defaults - US HCM (Customary)	East	RoadName	Two Way	1	1	1600.0	0	-	-	Yield	-
AM 2027 Reighmoor	North	Reighmoor Rd	Two Way	1	1	1600.0	0	-	-	Yield	-
Defaults - US HCM (Customary)	North	RoadName	Two Way	1	1	1600.0	0	-	-	Yield	-
AM 2027 Reighmoor	West	STH 21	Two Way	1	1	1600.0	0	-	-	Yield	-
Defaults - US HCM (Customary)	West	RoadName	Two Way	1	1	1600.0	0	-	-	Yield	-

Movement Definitions - Included Movement Classes

SITE	Included	Name	ID	Model Designation
No Difference				

Movement Definitions - Origin-Destination Movements

SITE	To Approach	Turn	OD Mov ID
No Difference			

SITE	U-Turn Before Intersection	Exclude U-Turn Before Intersection From Signal Analysis
No Difference		

Lane Geometry - Lane Configuration

SITE	Leg	Item	Config	Type	Control	Slip/ Bypass Control	Length	Width	Grade	Island [Front Width	Back Width	Fill Style	Cnct To	For Ped Stgn	Short Strip Isl]

	ft	ft	%	ft	ft
No Difference					

Lane Geometry - Lane Disciplines

SITE	To Approach	Turn	Free Queue Distance ft	Movement Class(es)
No Difference				

Lane Geometry - Lane Disciplines - Lane Change Data

SITE	Movement Class	% Lane Change to Left %	% Lane Change to Right %
No Difference			

Lane Geometry - Lane Data

Approach Lane Data

SITE	Approach Lane	Basic Satn Flow tcu/h	Util Ratio %	Satn Speed mph	Capacity Adj %	Use Given Cap Adj in Network Analysis	Set As Dominant Lane	Include SLip/ ByPass Lane in Entry Lane Count	Apply Satn Flow Est	Short Lane Capacity	Delay Model Param
No Difference											

Merge Analysis

SITE	Exit Lane	Merge Lane Number	Apply Merge Analysis	Merge Type	Percent Opposing in Short Lane %	Percent Opposing in Merge Lane %	Critical Gap sec	Follow-up Headway sec	Minimum Departures veh/min
No Difference									

Lane Movements - Flow Proportions

SITE	Exit Lane	To Exit Leg South %	East %	North %	West %
Light Vehicles (LV)					
From: South	App. Lane 1				
AM 2027 Reighmoor	Exit Lane 1	-	100	100	100
Defaults - US HCM (Customary)	Exit Lane 1	-	-	100	100
From: East	App. Lane 1				
AM 2027 Reighmoor	Exit Lane 1	100	-	100	100
Defaults - US HCM (Customary)	Exit Lane 1	100	-	-	100
From: North	App. Lane 1				
AM 2027 Reighmoor	Exit Lane 1	100	100	-	100
Defaults - US HCM (Customary)	Exit Lane 1	100	100	-	-
From: West	App. Lane 1				
AM 2027 Reighmoor	Exit Lane 1	100	100	100	-
Defaults - US HCM (Customary)	Exit Lane 1	-	100	100	-
Heavy Vehicles (HV)					
From: South	App. Lane 1				

AM 2027 Reighmoor	Exit Lane 1	-	100	100	100
Defaults - US HCM (Customary)	Exit Lane 1	-	-	100	100
From: East	App. Lane 1				
AM 2027 Reighmoor	Exit Lane 1	100	-	100	100
Defaults - US HCM (Customary)	Exit Lane 1	100	-	-	100
From: North	App. Lane 1				
AM 2027 Reighmoor	Exit Lane 1	100	100	-	100
Defaults - US HCM (Customary)	Exit Lane 1	100	100	-	-
From: West	App. Lane 1				
AM 2027 Reighmoor	Exit Lane 1	100	100	100	-
Defaults - US HCM (Customary)	Exit Lane 1	-	100	100	-

Lane Movements - Blockage Calibration

SITE	Exit Lane	To Exit Leg South	East	North	West
From: South	App. Lane 1				
AM 2027 Reighmoor	Exit Lane 1	-	1	1	1
Defaults - US HCM (Customary)	Exit Lane 1	-	-	1	1
From: East	App. Lane 1				
AM 2027 Reighmoor	Exit Lane 1	1	-	1	1
Defaults - US HCM (Customary)	Exit Lane 1	1	-	-	1
From: North	App. Lane 1				
AM 2027 Reighmoor	Exit Lane 1	1	1	-	1
Defaults - US HCM (Customary)	Exit Lane 1	1	1	-	-
From: West	App. Lane 1				
AM 2027 Reighmoor	Exit Lane 1	1	1	1	-
Defaults - US HCM (Customary)	Exit Lane 1	-	1	1	-

Roundabouts - Options

SITE	AM 2027 Reighmoor	Defaults - US HCM (Customary)
	No Difference	

Roundabouts - Geometry

SITE	Location	Name	Circ. Lanes	Circ. Width	Island Diameter	Inscribed Diameter	Entry Radius	Entry Angle	Raindrop Design	Circ Trans Line	Downstream Circ Lanes
				ft	ft	ft	ft	°			
AM 2027 Reighmoor	South	Reighmoor Rd	1	20	100	-	100	30	No	No	-
Defaults - US HCM (Customary)	South	RoadName	2	30	100	-	65	30	No	No	-
AM 2027 Reighmoor	East	STH 21	1	20	100	-	100	30	No	No	-
Defaults - US HCM (Customary)	East	RoadName	2	30	100	-	65	30	No	No	-
AM 2027 Reighmoor	North	Reighmoor Rd	1	20	100	-	100	30	No	No	-
Defaults - US HCM (Customary)	North	RoadName	2	30	100	-	65	30	No	No	-
AM 2027 Reighmoor	West	STH 21	1	20	100	-	100	30	No	No	-
Defaults - US HCM (Customary)	West	RoadName	2	30	100	-	65	30	No	No	-

HCM 2010 Roundabout Model Parameters

SITE	Location	Name	Single L.Circ: Single L.Entry		Single L.Circ: Multi L.Entry		Multi L.Circ: Single L.Entry		Multi L.Circ: Dominant Lane		Multi L.Circ: Subdominant Lane	
			Para. A	Para. B	Para. A	Para. B	Para. A	Para. B	Para. A	Para. B	Para. A	Para. B
AM 2027 Reighmoor	South	Reighmoor Rd	1385	0.000944	1420	0.00091	1420	0.00085	1420	0.00085	1350	0.00092
Defaults - US HCM (Customary)	South	RoadName	1380	0.00102	1420	0.00091	1420	0.00085	1420	0.00085	1350	0.00092
AM 2027 Reighmoor	East	STH 21	1385	0.000944	1420	0.00091	1420	0.00085	1420	0.00085	1350	0.00092
Defaults - US HCM (Customary)	East	RoadName	1380	0.00102	1420	0.00091	1420	0.00085	1420	0.00085	1350	0.00092
AM 2027 Reighmoor	North	Reighmoor Rd	1385	0.000944	1420	0.00091	1420	0.00085	1420	0.00085	1350	0.00092
Defaults - US HCM (Customary)	North	RoadName	1380	0.00102	1420	0.00091	1420	0.00085	1420	0.00085	1350	0.00092
AM 2027 Reighmoor	West	STH 21	1385	0.000944	1420	0.00091	1420	0.00085	1420	0.00085	1350	0.00092
Defaults - US HCM (Customary)	West	RoadName	1380	0.00102	1420	0.00091	1420	0.00085	1420	0.00085	1350	0.00092

HCM 6 Roundabout Model Calibration

SITE	Location	Name	Model Calib. Factor (HCM6)	Entry/Circ. Flow Adjust. (HCM6)
AM 2027 Reighmoor	South	Reighmoor Rd	1	None
Defaults - US HCM (Customary)	South	RoadName	1	None
AM 2027 Reighmoor	East	STH 21	1	None
Defaults - US HCM (Customary)	East	RoadName	1	None
AM 2027 Reighmoor	North	Reighmoor Rd	1	None
Defaults - US HCM (Customary)	North	RoadName	1	None
AM 2027 Reighmoor	West	STH 21	1	None
Defaults - US HCM (Customary)	West	RoadName	1	None

Pedestrians - Pedestrian Movements

SITE	Main Crossing/ Slip/Bypass Lane Crossing	Volume ped	Peak Flow %	Flow Scale %	Growth Rate %
No Difference					

Pedestrians - Pedestrian Movement Data

SITE	Main Crossing/ Slip/Bypass Lane Crossing	Mov. ID	Crossing Distance ft	Conflict Zone Length ft	Oppng Ped.Fac.	P.Deg. Satn	Walking Speed ft/sec	App. Trav. Distance ft	Downst. Distance ft	Queue Space ft	Cr. Setback Distance
No Difference											

Volumes - Volume Data Settings

SITE	AM 2027 Reighmoor	Defaults - US HCM (Customary)
No Difference		

Volumes - Vehicle Volumes

SITE	Movement Class	To Exit Leg
NA		

Volumes - Volume Factors

SITE	To Approach	Peak Flow Factor %	Flow Scale %	Growth Rate %/year
No Difference				

Gap Acceptance - Gap Acceptance Data

SITE	Opposed Movement	Critical Gap sec	Follow-up Headway sec	Minimum Departures veh/min	Exiting Flow Effect %	% Opp. By Nearest Lane %	Opng. Peds (UnSig)
No Difference							

Gap Acceptance - Settings

Gap Acceptance Options
No Difference

Gap Acceptance Data for Specific Applications					
SITE	Critical Gap sec	Follow-up Headway sec	Minimum Departures veh/min	Exiting Flow Effect %	% Opp. By Nearest Lane %
No Difference					

Merge Analysis & Zebra Crossing Analysis Parameters						
SITE	Movement Class	Parameter	Zebra Crossing on Slip/Bypass Lane	Midblock Zebra Crossing	Merge Analysis [Exit Short Lane	Merge Lane]
No Difference						

Vehicle Movement Data - Path Data

SITE	Turn	Approach Cruise Speed mph	Exit Cruise Speed mph	Negotiation Speed mph	Negotiation Distance ft	Downstream Distance ft	Negotiation Radius ft
No Difference							

Vehicle Movement Data - Calibration

SITE	Turn	Queue Space ft	Vehicle Length ft	Vehicle Occupancy pers/veh	Turn Veh Effect [Factor	Radius] ft	Gap Accp Factor	Opng. Veh Factor	Prac. Deg. Of Satn.
No Difference									

Site Demand & Sensitivity

SITE	AM 2027 Reighmoor	Defaults - US HCM (Customary)
No Difference		

Parameter Settings - Options

SITE	AM 2027 Reighmoor	Defaults - US HCM (Customary)
No Difference		

Parameter Settings - Model Parameters

SITE	AM 2027 Reighmoor	Defaults - US HCM (Customary)
No Difference		

Parameter Settings - Cost

Efficiency Parameters			
SITE	Movement Class	Desired Speed mph	Lower Limit of Speed Efficiency for TTI
No Difference			

Vehicle Cost Parameters							
			Veh Operating Cost			Veh Time Cost	
SITE	Movement Class	Veh Cost Method	[Pump Price of Fuel $/Gal	Fuel Res. Cost Factor	Ratio of Running Cost to Fuel Cost]	[Avg. Income $/h	Time Value Factor]
AM 2027 Reighmoor	Light Vehicles (LV)	Operating Cost	2.3	0.7	3	27	0.4
Defaults - US HCM (Customary)	Light Vehicles (LV)	Operating Cost	2.5	0.7	3	29	0.4
AM 2027 Reighmoor	Heavy Vehicles (HV)	Operating Cost	2.3	0.7	3	27	0.4
Defaults - US HCM (Customary)	Heavy Vehicles (HV)	Operating Cost	2.5	0.7	3	29	0.4

Cost Options		
SITE	AM 2027 Reighmoor	Defaults - US HCM (Customary)
No Difference		

Pedestrian Cost Parameters
SITE
Not Applicable

Parameter Settings - Vehicle Parameters

SITE	Movement Class	Vehicle Parameters		CO2 to Fuel Rate
		Mass lb	Max Power kW	
No Difference				

Parameter Settings - Fuel Consumption

SITE	Movement Class	Fuel & Emission Model Parameters			
		fi	A	B	Beta
No Difference					

Parameter Settings - CO Emission

SITE	Movement Class	Fuel & Emission Model Parameters			
		fi	A	B	Beta
No Difference					

Parameter Settings - HC Emission

SITE	Movement Class	Fuel & Emission Model Parameters			
		fi	A	B	Beta
No Difference					

Parameter Settings - NOx Emission

SITE	Movement Class	Fuel & Emission Model Parameters			
		fi	A	B	Beta
No Difference					

Parameter Settings - Advanced

SITE	AM 2027 Reighmoor	Defaults - US HCM (Customary)
No Difference		

MOVEMENT SUMMARY

Site: 101 [AM 2027 Reighmoor (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Reighmoor Rd														
3	L2	16	3.0	17	3.0	0.091	5.5	LOS A	0.3	8.7	0.53	0.46	0.53	34.2
8	T1	4	3.0	4	3.0	0.091	5.5	LOS A	0.3	8.7	0.53	0.46	0.53	34.2
18	R2	46	3.0	50	3.0	0.091	5.5	LOS A	0.3	8.7	0.53	0.46	0.53	33.2
Approach		66	3.0	72	3.0	0.091	5.5	LOS A	0.3	8.7	0.53	0.46	0.53	33.5
East: STH 21														
1	L2	16	3.0	17	3.0	0.240	4.8	LOS A	1.2	30.0	0.13	0.04	0.13	35.2
6	T1	270	3.0	293	3.0	0.240	4.8	LOS A	1.2	30.0	0.13	0.04	0.13	35.2
16	R2	3	3.0	3	3.0	0.240	4.8	LOS A	1.2	30.0	0.13	0.04	0.13	34.1
Approach		289	3.0	314	3.0	0.240	4.8	LOS A	1.2	30.0	0.13	0.04	0.13	35.2
North: Reighmoor Rd														
7	L2	22	3.0	24	3.0	0.056	4.2	LOS A	0.2	5.4	0.41	0.29	0.41	34.4
4	T1	14	3.0	15	3.0	0.056	4.2	LOS A	0.2	5.4	0.41	0.29	0.41	34.3
14	R2	14	3.0	15	3.0	0.056	4.2	LOS A	0.2	5.4	0.41	0.29	0.41	33.3
Approach		50	3.0	54	3.0	0.056	4.2	LOS A	0.2	5.4	0.41	0.29	0.41	34.1
West: STH 21														
5	L2	5	3.0	5	3.0	0.435	7.2	LOS A	2.7	69.7	0.25	0.11	0.25	34.1
2	T1	482	3.0	524	3.0	0.435	7.2	LOS A	2.7	69.7	0.25	0.11	0.25	34.1
12	R2	22	3.0	24	3.0	0.435	7.2	LOS A	2.7	69.7	0.25	0.11	0.25	33.1
Approach		509	3.0	553	3.0	0.435	7.2	LOS A	2.7	69.7	0.25	0.11	0.25	34.0
All Vehicles		914	3.0	993	3.0	0.435	6.1	LOS A	2.7	69.7	0.24	0.12	0.24	34.4

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

Site: 101 [AM 2027 Reighmoor (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Reighmoor Rd													
Lane 1[d]	72	3.0	785	0.091	100	5.5	LOS A	0.3	8.7	Full	1600	0.0	0.0
Approach	72	3.0		0.091		5.5	LOS A	0.3	8.7				
East: STH 21													
Lane 1[d]	314	3.0	1310	0.240	100	4.8	LOS A	1.2	30.0	Full	1600	0.0	0.0
Approach	314	3.0		0.240		4.8	LOS A	1.2	30.0				
North: Reighmoor Rd													
Lane 1[d]	54	3.0	977	0.056	100	4.2	LOS A	0.2	5.4	Full	1600	0.0	0.0
Approach	54	3.0		0.056		4.2	LOS A	0.2	5.4				
West: STH 21													
Lane 1[d]	553	3.0	1273	0.435	100	7.2	LOS A	2.7	69.7	Full	1600	0.0	0.0
Approach	553	3.0		0.435		7.2	LOS A	2.7	69.7				
Intersection	993	3.0		0.435		6.1	LOS A	2.7	69.7				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Reighmoor Rd

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	17	4	50	72	3.0	785	0.091	100	NA	NA
Approach	17	4	50	72	3.0		0.091			

East: STH 21

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	17	293	3	314	3.0	1310	0.240	100	NA	NA
Approach	17	293	3	314	3.0		0.240			

North: Reighmoor Rd										
Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	24	15	15	54	3.0	977	0.056	100	NA	NA
Approach	24	15	15	54	3.0		0.056			
West: STH 21										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	5	524	24	553	3.0	1273	0.435	100	NA	NA
Approach	5	524	24	553	3.0		0.435			
	Total	%HV	Deg.Satn (v/c)							
Intersection	993	3.0		0.435						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

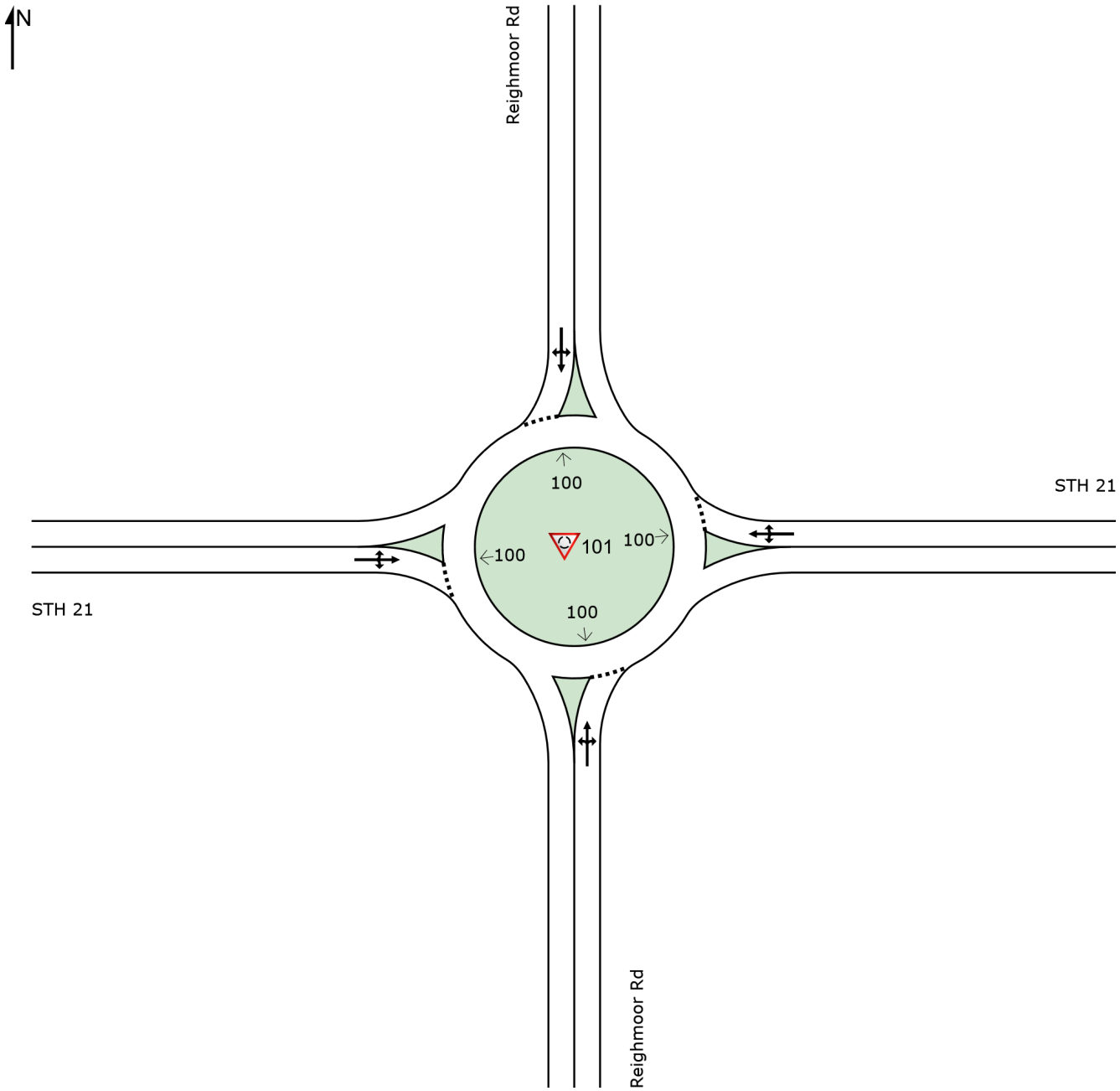
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Reighmoor Rd Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: STH 21 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: Reighmoor Rd Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: STH 21 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

SITE LAYOUT

Site: 101 [PM 2027 Reighmoor (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT FLOWS FOR SITE (INPUT)

Approach movement input flow rates (veh/h)

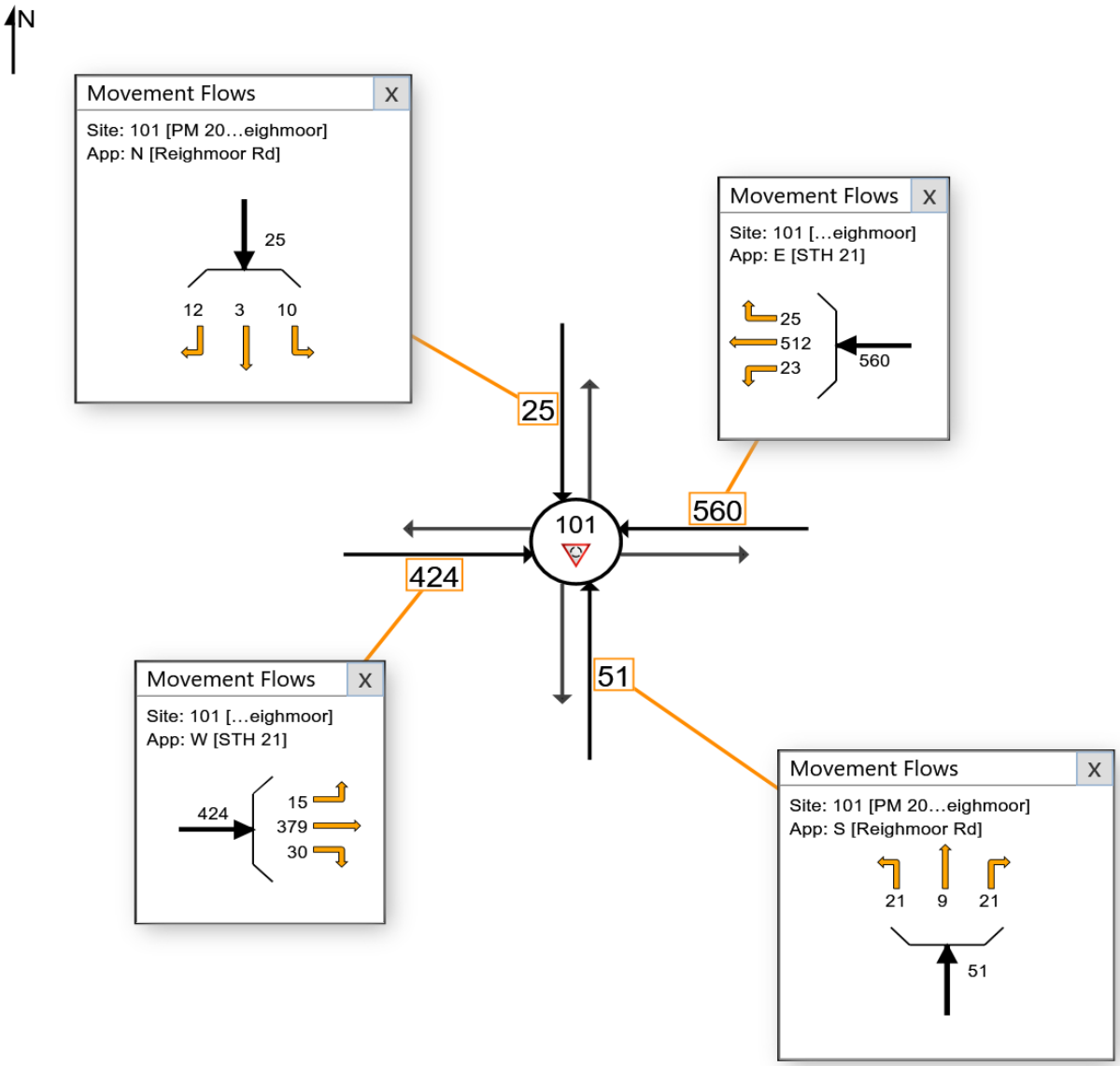
All Movement Classes

Site: 101 [PM 2027 Reighmoor (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
Click and drag popup boxes to move to preferred positions.

Close All Popups



INPUT COMPARISON

Site A: 101 [PM 2027 Reighmoor (Site Folder: General)]

Site B:

Intersection - Site Data

SITE	PM 2027 Reighmoor	Defaults - US HCM (Customary)
No Difference		

Intersection - Site Properties

SITE	PM 2027 Reighmoor	Defaults - US HCM (Customary)
NA		

Intersection - Approach & Exit Data

SITE	Location	Name	Type	No. of App. Lanes	No. of Exit Lanes	Approach Distance ft	Extra Bunching (Site Analysis) %	Extra Bunching (Network Analysis) %	Exit Distance ft	Approach Control	Area Type Factor
PM 2027 Reighmoor	South	Reighmoor Rd	Two Way	1	1	1600.0	0	-	-	Yield	-
Defaults - US HCM (Customary)	South	RoadName	Two Way	1	1	1600.0	0	-	-	Yield	-
PM 2027 Reighmoor	East	STH 21	Two Way	1	1	1600.0	0	-	-	Yield	-
Defaults - US HCM (Customary)	East	RoadName	Two Way	1	1	1600.0	0	-	-	Yield	-
PM 2027 Reighmoor	North	Reighmoor Rd	Two Way	1	1	1600.0	0	-	-	Yield	-
Defaults - US HCM (Customary)	North	RoadName	Two Way	1	1	1600.0	0	-	-	Yield	-
PM 2027 Reighmoor	West	STH 21	Two Way	1	1	1600.0	0	-	-	Yield	-
Defaults - US HCM (Customary)	West	RoadName	Two Way	1	1	1600.0	0	-	-	Yield	-

Movement Definitions - Included Movement Classes

SITE	Included	Name	ID	Model Designation
No Difference				

Movement Definitions - Origin-Destination Movements

SITE	To Approach	Turn	OD Mov ID
No Difference			

SITE	U-Turn Before Intersection	Exclude U-Turn Before Intersection From Signal Analysis
No Difference		

Lane Geometry - Lane Configuration

SITE	Leg	Item	Config	Type	Control	Slip/ Bypass Control	Length	Width	Grade	Island [Front Width	Back Width	Fill Style	Cnct To	For Ped Stgn	Short Strip Isl]

	ft	ft	%	ft	ft
No Difference					

Lane Geometry - Lane Disciplines

SITE	To Approach	Turn	Free Queue Distance ft	Movement Class(es)
No Difference				

Lane Geometry - Lane Disciplines - Lane Change Data

SITE	Movement Class	% Lane Change to Left %	% Lane Change to Right %
No Difference			

Lane Geometry - Lane Data

Approach Lane Data

SITE	Approach Lane	Basic Satn Flow tcu/h	Util Ratio %	Satn Speed mph	Capacity Adj %	Use Given Cap Adj in Network Analysis	Set As Dominant Lane	Include SLip/ ByPass Lane in Entry Lane Count	Apply Satn Flow Est	Short Lane Capacity	Delay Model Param
No Difference											

Merge Analysis

SITE	Exit Lane	Merge Lane Number	Apply Merge Analysis	Merge Type	Percent Opposing in Short Lane %	Percent Opposing in Merge Lane %	Critical Gap sec	Follow-up Headway sec	Minimum Departures veh/min
No Difference									

Lane Movements - Flow Proportions

SITE	Exit Lane	To Exit Leg South %	East %	North %	West %
Light Vehicles (LV)					
From: South	App. Lane 1				
PM 2027 Reighmoor	Exit Lane 1	-	100	100	100
Defaults - US HCM (Customary)	Exit Lane 1	-	-	100	100
From: East	App. Lane 1				
PM 2027 Reighmoor	Exit Lane 1	100	-	100	100
Defaults - US HCM (Customary)	Exit Lane 1	100	-	-	100
From: North	App. Lane 1				
PM 2027 Reighmoor	Exit Lane 1	100	100	-	100
Defaults - US HCM (Customary)	Exit Lane 1	100	100	-	-
From: West	App. Lane 1				
PM 2027 Reighmoor	Exit Lane 1	100	100	100	-
Defaults - US HCM (Customary)	Exit Lane 1	-	100	100	-
Heavy Vehicles (HV)					
From: South	App. Lane 1				

PM 2027 Reighmoor	Exit Lane 1	-	100	100	100
Defaults - US HCM (Customary)	Exit Lane 1	-	-	100	100
From: East	App. Lane 1				
PM 2027 Reighmoor	Exit Lane 1	100	-	100	100
Defaults - US HCM (Customary)	Exit Lane 1	100	-	-	100
From: North	App. Lane 1				
PM 2027 Reighmoor	Exit Lane 1	100	100	-	100
Defaults - US HCM (Customary)	Exit Lane 1	100	100	-	-
From: West	App. Lane 1				
PM 2027 Reighmoor	Exit Lane 1	100	100	100	-
Defaults - US HCM (Customary)	Exit Lane 1	-	100	100	-

Lane Movements - Blockage Calibration

SITE	Exit Lane	To Exit Leg South	East	North	West
From: South	App. Lane 1				
PM 2027 Reighmoor	Exit Lane 1	-	1	1	1
Defaults - US HCM (Customary)	Exit Lane 1	-	-	1	1
From: East	App. Lane 1				
PM 2027 Reighmoor	Exit Lane 1	1	-	1	1
Defaults - US HCM (Customary)	Exit Lane 1	1	-	-	1
From: North	App. Lane 1				
PM 2027 Reighmoor	Exit Lane 1	1	1	-	1
Defaults - US HCM (Customary)	Exit Lane 1	1	1	-	-
From: West	App. Lane 1				
PM 2027 Reighmoor	Exit Lane 1	1	1	1	-
Defaults - US HCM (Customary)	Exit Lane 1	-	1	1	-

Roundabouts - Options

SITE	PM 2027 Reighmoor	Defaults - US HCM (Customary)
	No Difference	

Roundabouts - Geometry

SITE	Location	Name	Circ. Lanes	Circ. Width	Island Diameter	Inscribed Diameter	Entry Radius	Entry Angle	Raindrop Design	Circ Trans Line	Downstream Circ Lanes
				ft	ft	ft	ft	°			
PM 2027 Reighmoor	South	Reighmoor Rd	1	20	100	-	100	30	No	No	-
Defaults - US HCM (Customary)	South	RoadName	2	30	100	-	65	30	No	No	-
PM 2027 Reighmoor	East	STH 21	1	20	100	-	100	30	No	No	-
Defaults - US HCM (Customary)	East	RoadName	2	30	100	-	65	30	No	No	-
PM 2027 Reighmoor	North	Reighmoor Rd	1	20	100	-	100	30	No	No	-
Defaults - US HCM (Customary)	North	RoadName	2	30	100	-	65	30	No	No	-
PM 2027 Reighmoor	West	STH 21	1	20	100	-	100	30	No	No	-
Defaults - US HCM (Customary)	West	RoadName	2	30	100	-	65	30	No	No	-

HCM 2010 Roundabout Model Parameters

SITE	Location	Name	Single L.Circ: Single L.Entry		Single L.Circ: Multi L.Entry		Multi L.Circ: Single L.Entry		Multi L.Circ: Dominant Lane		Multi L.Circ: Subdominant Lane	
			Para. A	Para. B	Para. A	Para. B	Para. A	Para. B	Para. A	Para. B	Para. A	Para. B
PM 2027 Reighmoor	South	Reighmoor Rd	1385	0.000944	1420	0.00091	1420	0.00085	1420	0.00085	1350	0.00092
Defaults - US HCM (Customary)	South	RoadName	1380	0.00102	1420	0.00091	1420	0.00085	1420	0.00085	1350	0.00092
PM 2027 Reighmoor	East	STH 21	1385	0.000944	1420	0.00091	1420	0.00085	1420	0.00085	1350	0.000944
Defaults - US HCM (Customary)	East	RoadName	1380	0.00102	1420	0.00091	1420	0.00085	1420	0.00085	1350	0.00092
PM 2027 Reighmoor	North	Reighmoor Rd	1385	0.000944	1420	0.00091	1420	0.00085	1420	0.00085	1350	0.000944
Defaults - US HCM (Customary)	North	RoadName	1380	0.00102	1420	0.00091	1420	0.00085	1420	0.00085	1350	0.00092
PM 2027 Reighmoor	West	STH 21	1385	0.000944	1420	0.00091	1420	0.00085	1420	0.00085	1350	0.000944
Defaults - US HCM (Customary)	West	RoadName	1380	0.00102	1420	0.00091	1420	0.00085	1420	0.00085	1350	0.00092

HCM 6 Roundabout Model Calibration

SITE	Location	Name	Model Calib. Factor (HCM6)	Entry/Circ. Flow Adjust. (HCM6)
PM 2027 Reighmoor	South	Reighmoor Rd	1	None
Defaults - US HCM (Customary)	South	RoadName	1	None
PM 2027 Reighmoor	East	STH 21	1	None
Defaults - US HCM (Customary)	East	RoadName	1	None
PM 2027 Reighmoor	North	Reighmoor Rd	1	None
Defaults - US HCM (Customary)	North	RoadName	1	None
PM 2027 Reighmoor	West	STH 21	1	None
Defaults - US HCM (Customary)	West	RoadName	1	None

Pedestrians - Pedestrian Movements

SITE	Main Crossing/ Slip/Bypass Lane Crossing	Volume ped	Peak Flow %	Flow Scale %	Growth Rate %
No Difference					

Pedestrians - Pedestrian Movement Data

SITE	Main Crossing/ Slip/Bypass Lane Crossing	Mov. ID	Crossing Distance ft	Conflict Zone Length ft	Oppng Ped.Fac.	P.Deg. Satn	Walking Speed ft/sec	App. Trav. Distance ft	Downst. Distance ft	Queue Space ft	Cr. Setback Distance
No Difference											

Volumes - Volume Data Settings

SITE	PM 2027 Reighmoor	Defaults - US HCM (Customary)
No Difference		

Volumes - Vehicle Volumes

SITE	Movement Class	To Exit Leg
NA		

Volumes - Volume Factors

SITE	To Approach	Peak Flow Factor %	Flow Scale %	Growth Rate %/year
No Difference				

Gap Acceptance - Gap Acceptance Data

SITE	Opposed Movement	Critical Gap sec	Follow-up Headway sec	Minimum Departures veh/min	Exiting Flow Effect %	% Opp. By Nearest Lane %	Opng. Peds (UnSig)
No Difference							

Gap Acceptance - Settings

Gap Acceptance Options
No Difference

Gap Acceptance Data for Specific Applications					
SITE	Critical Gap sec	Follow-up Headway sec	Minimum Departures veh/min	Exiting Flow Effect %	% Opp. By Nearest Lane %
No Difference					

Merge Analysis & Zebra Crossing Analysis Parameters						
SITE	Movement Class	Parameter	Zebra Crossing on Slip/Bypass Lane	Midblock Zebra Crossing	Merge Analysis [Exit Short Lane	Merge Lane]
No Difference						

Vehicle Movement Data - Path Data

SITE	Turn	Approach Cruise Speed mph	Exit Cruise Speed mph	Negotiation Speed mph	Negotiation Distance ft	Downstream Distance ft	Negotiation Radius ft
No Difference							

Vehicle Movement Data - Calibration

SITE	Turn	Queue Space ft	Vehicle Length ft	Vehicle Occupancy pers/veh	Turn Veh Effect [Factor	Radius] ft	Gap Accp Factor	Opng. Veh Factor	Prac. Deg. Of Satn.
No Difference									

Site Demand & Sensitivity

SITE	PM 2027 Reighmoor	Defaults - US HCM (Customary)
No Difference		

Parameter Settings - Options

SITE	PM 2027 Reighmoor	Defaults - US HCM (Customary)
No Difference		

Parameter Settings - Model Parameters

SITE	PM 2027 Reighmoor	Defaults - US HCM (Customary)
No Difference		

Parameter Settings - Cost

Efficiency Parameters			
SITE	Movement Class	Desired Speed mph	Lower Limit of Speed Efficiency for TTI
No Difference			

Vehicle Cost Parameters							
			Veh Operating Cost			Veh Time Cost	
SITE	Movement Class	Veh Cost Method	[Pump Price of Fuel $/Gal	Fuel Res. Cost Factor	Ratio of Running Cost to Fuel Cost]	[Avg. Income $/h	Time Value Factor]
PM 2027 Reighmoor	Light Vehicles (LV)	Operating Cost	2.3	0.7	3	27	0.4
Defaults - US HCM (Customary)	Light Vehicles (LV)	Operating Cost	2.5	0.7	3	29	0.4
PM 2027 Reighmoor	Heavy Vehicles (HV)	Operating Cost	2.3	0.7	3	27	0.4
Defaults - US HCM (Customary)	Heavy Vehicles (HV)	Operating Cost	2.5	0.7	3	29	0.4

Cost Options		
SITE	PM 2027 Reighmoor	Defaults - US HCM (Customary)
No Difference		

Pedestrian Cost Parameters
SITE
Not Applicable

Parameter Settings - Vehicle Parameters

SITE	Movement Class	Vehicle Parameters		CO2 to Fuel Rate
		Mass lb	Max Power kW	
No Difference				

Parameter Settings - Fuel Consumption

SITE	Movement Class	Fuel & Emission Model Parameters			
		fi	A	B	Beta
No Difference					

Parameter Settings - CO Emission

SITE	Movement Class	Fuel & Emission Model Parameters			
		fi	A	B	Beta
No Difference					

Parameter Settings - HC Emission

SITE	Movement Class	Fuel & Emission Model Parameters			
		fi	A	B	Beta
No Difference					

Parameter Settings - NOx Emission

SITE	Movement Class	Fuel & Emission Model Parameters			
		fi	A	B	Beta
No Difference					

Parameter Settings - Advanced

SITE	PM 2027 Reighmoor	Defaults - US HCM (Customary)
No Difference		

MOVEMENT SUMMARY

Site: 101 [PM 2027 Reighmoor (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Reighmoor Rd														
3	L2	21	3.0	23	3.0	0.063	4.7	LOS A	0.2	6.0	0.47	0.37	0.47	34.2
8	T1	9	3.0	10	3.0	0.063	4.7	LOS A	0.2	6.0	0.47	0.37	0.47	34.1
18	R2	21	3.0	23	3.0	0.063	4.7	LOS A	0.2	6.0	0.47	0.37	0.47	33.1
Approach		51	3.0	55	3.0	0.063	4.7	LOS A	0.2	6.0	0.47	0.37	0.47	33.7
East: STH 21														
1	L2	23	3.0	25	3.0	0.475	7.7	LOS A	3.2	81.6	0.25	0.10	0.25	33.8
6	T1	512	3.0	557	3.0	0.475	7.7	LOS A	3.2	81.6	0.25	0.10	0.25	33.7
16	R2	25	3.0	27	3.0	0.475	7.7	LOS A	3.2	81.6	0.25	0.10	0.25	32.8
Approach		560	3.0	609	3.0	0.475	7.7	LOS A	3.2	81.6	0.25	0.10	0.25	33.7
North: Reighmoor Rd														
7	L2	10	3.0	11	3.0	0.036	5.2	LOS A	0.1	3.3	0.53	0.44	0.53	34.0
4	T1	3	3.0	3	3.0	0.036	5.2	LOS A	0.1	3.3	0.53	0.44	0.53	33.9
14	R2	12	3.0	13	3.0	0.036	5.2	LOS A	0.1	3.3	0.53	0.44	0.53	32.9
Approach		25	3.0	27	3.0	0.036	5.2	LOS A	0.1	3.3	0.53	0.44	0.53	33.5
West: STH 21														
5	L2	15	3.0	16	3.0	0.356	6.1	LOS A	2.0	51.5	0.18	0.07	0.18	34.6
2	T1	379	3.0	412	3.0	0.356	6.1	LOS A	2.0	51.5	0.18	0.07	0.18	34.6
12	R2	30	3.0	33	3.0	0.356	6.1	LOS A	2.0	51.5	0.18	0.07	0.18	33.6
Approach		424	3.0	461	3.0	0.356	6.1	LOS A	2.0	51.5	0.18	0.07	0.18	34.5
All Vehicles		1060	3.0	1152	3.0	0.475	6.8	LOS A	3.2	81.6	0.24	0.11	0.24	34.0

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

Site: 101 [PM 2027 Reighmoor (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Reighmoor Rd													
Lane 1[d]	55	3.0	877	0.063	100	4.7	LOS A	0.2	6.0	Full	1600	0.0	0.0
Approach	55	3.0		0.063		4.7	LOS A	0.2	6.0				
East: STH 21													
Lane 1[d]	609	3.0	1282	0.475	100	7.7	LOS A	3.2	81.6	Full	1600	0.0	0.0
Approach	609	3.0		0.475		7.7	LOS A	3.2	81.6				
North: Reighmoor Rd													
Lane 1[d]	27	3.0	747	0.036	100	5.2	LOS A	0.1	3.3	Full	1600	0.0	0.0
Approach	27	3.0		0.036		5.2	LOS A	0.1	3.3				
West: STH 21													
Lane 1[d]	461	3.0	1294	0.356	100	6.1	LOS A	2.0	51.5	Full	1600	0.0	0.0
Approach	461	3.0		0.356		6.1	LOS A	2.0	51.5				
Intersection	1152	3.0		0.475		6.8	LOS A	3.2	81.6				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Reighmoor Rd

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	23	10	23	55	3.0	877	0.063	100	NA	NA
Approach	23	10	23	55	3.0		0.063			

East: STH 21

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	25	557	27	609	3.0	1282	0.475	100	NA	NA
Approach	25	557	27	609	3.0		0.475			

North: Reighmoor Rd										
Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	11	3	13	27	3.0	747	0.036	100	NA	NA
Approach	11	3	13	27	3.0		0.036			
West: STH 21										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	16	412	33	461	3.0	1294	0.356	100	NA	NA
Approach	16	412	33	461	3.0		0.356			
	Total	%HV	Deg.Satn (v/c)							
Intersection	1152	3.0		0.475						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

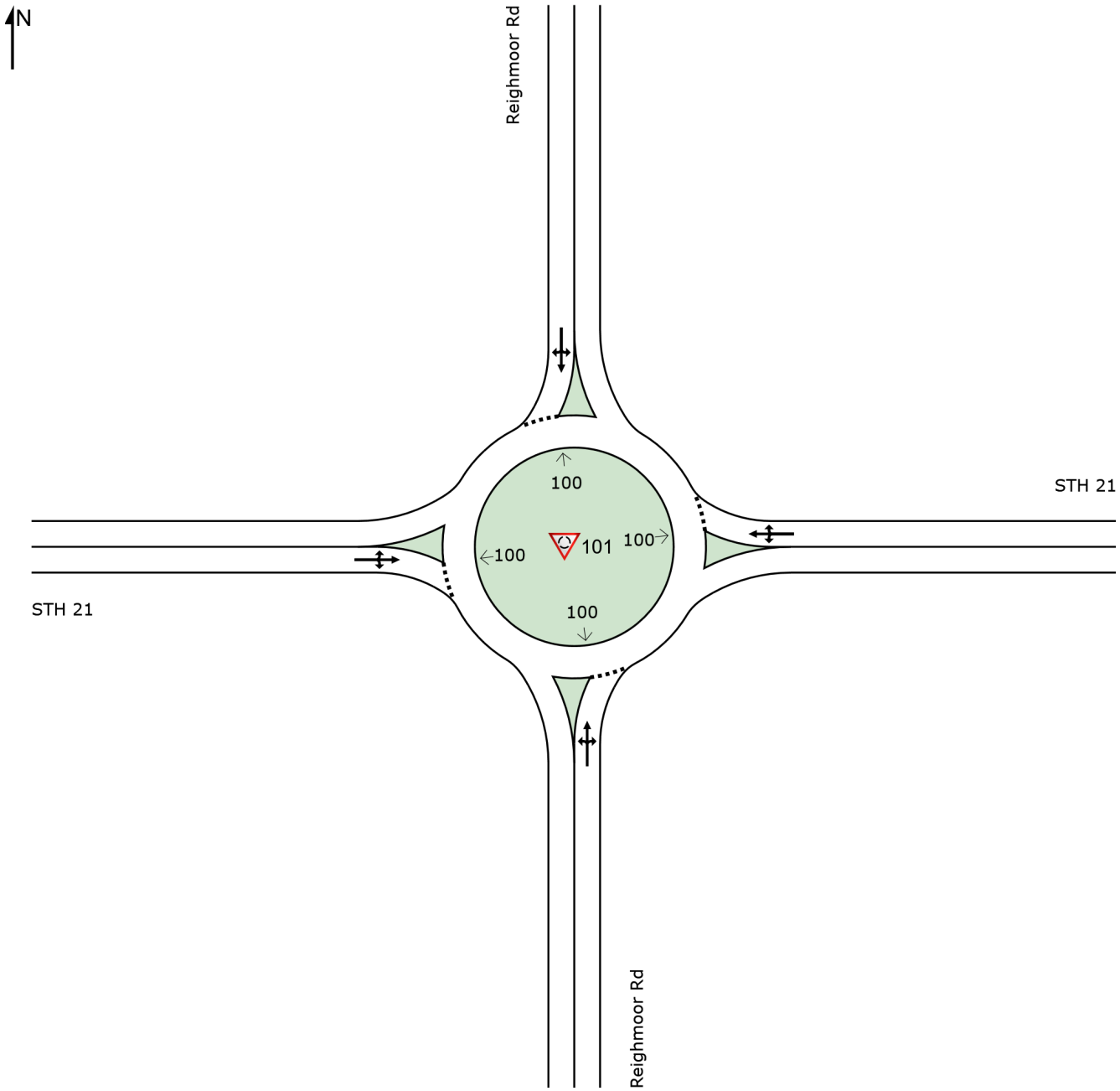
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Reighmoor Rd Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: STH 21 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: Reighmoor Rd Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: STH 21 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

SITE LAYOUT

Site: 101 [AM 2047 Reighmoor (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT FLOWS FOR SITE (INPUT)

Approach movement input flow rates (veh/h)

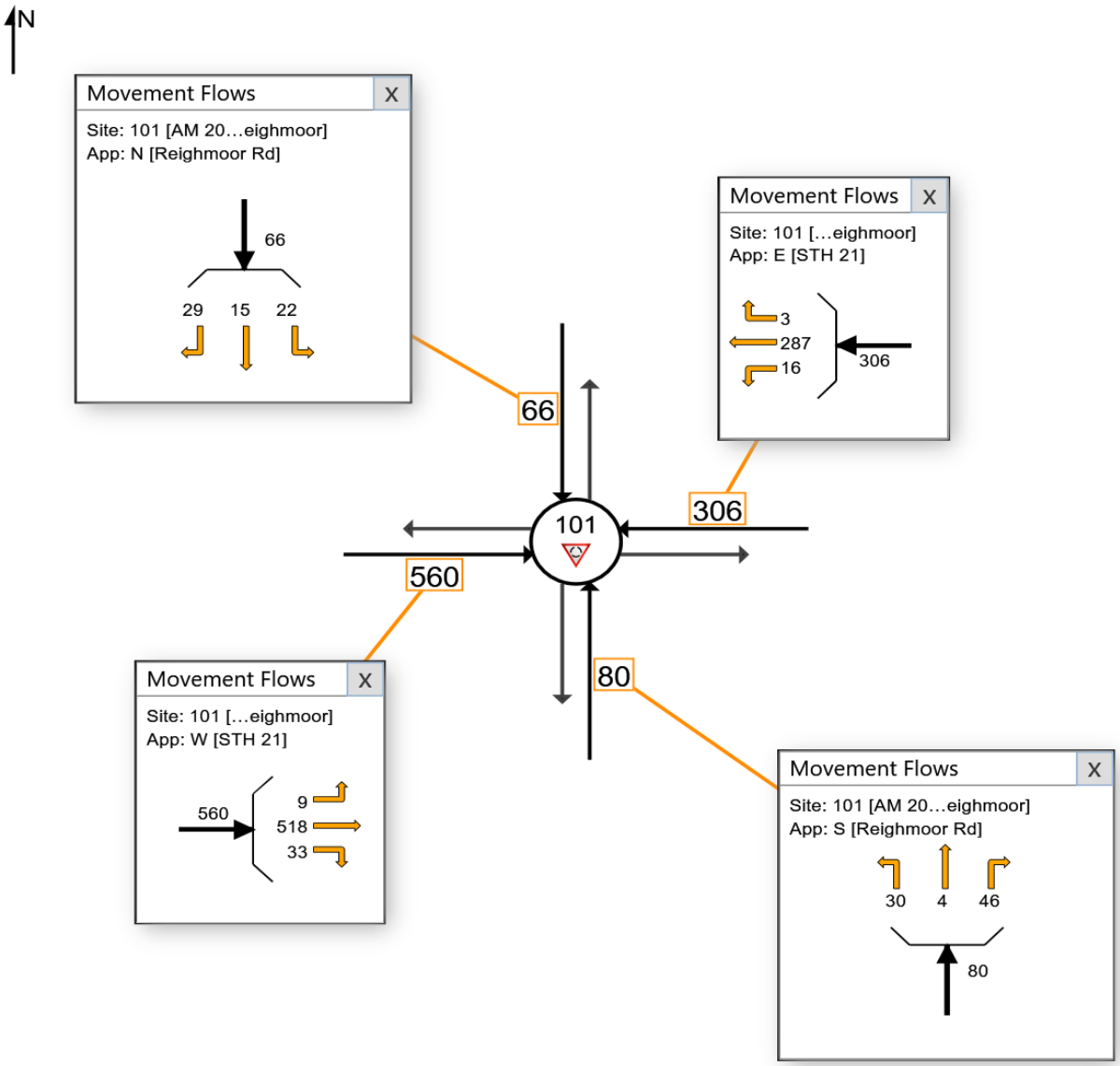
All Movement Classes

Site: 101 [AM 2047 Reighmoor (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
Click and drag popup boxes to move to preferred positions.

Close All Popups



INPUT COMPARISON

Site A: 101 [AM 2047 Reighmoor (Site Folder: General)]

Site B:

Intersection - Site Data

SITE	AM 2047 Reighmoor	Defaults - US HCM (Customary)
No Difference		

Intersection - Site Properties

SITE	AM 2047 Reighmoor	Defaults - US HCM (Customary)
NA		

Intersection - Approach & Exit Data

SITE	Location	Name	Type	No. of App. Lanes	No. of Exit Lanes	Approach Distance ft	Extra Bunching (Site Analysis) %	Extra Bunching (Network Analysis) %	Exit Distance ft	Approach Control	Area Type Factor
AM 2047 Reighmoor	South	Reighmoor Rd	Two Way	1	1	1600.0	0	-	-	Yield	-
Defaults - US HCM (Customary)	South	RoadName	Two Way	1	1	1600.0	0	-	-	Yield	-
AM 2047 Reighmoor	East	STH 21	Two Way	1	1	1600.0	0	-	-	Yield	-
Defaults - US HCM (Customary)	East	RoadName	Two Way	1	1	1600.0	0	-	-	Yield	-
AM 2047 Reighmoor	North	Reighmoor Rd	Two Way	1	1	1600.0	0	-	-	Yield	-
Defaults - US HCM (Customary)	North	RoadName	Two Way	1	1	1600.0	0	-	-	Yield	-
AM 2047 Reighmoor	West	STH 21	Two Way	1	1	1600.0	0	-	-	Yield	-
Defaults - US HCM (Customary)	West	RoadName	Two Way	1	1	1600.0	0	-	-	Yield	-

Movement Definitions - Included Movement Classes

SITE	Included	Name	ID	Model Designation
No Difference				

Movement Definitions - Origin-Destination Movements

SITE	To Approach	Turn	OD Mov ID
No Difference			

SITE	U-Turn Before Intersection	Exclude U-Turn Before Intersection From Signal Analysis
No Difference		

Lane Geometry - Lane Configuration

SITE	Leg	Item	Config	Type	Control	Slip/ Bypass Control	Length	Width	Grade	Island [Front Width	Back Width	Fill Style	Cnct To	For Ped Stgn	Short Strip Isl]

	ft	ft	%	ft	ft
No Difference					

Lane Geometry - Lane Disciplines

SITE	To Approach	Turn	Free Queue Distance ft	Movement Class(es)
No Difference				

Lane Geometry - Lane Disciplines - Lane Change Data

SITE	Movement Class	% Lane Change to Left %	% Lane Change to Right %
No Difference			

Lane Geometry - Lane Data

Approach Lane Data

SITE	Approach Lane	Basic Satn Flow tcu/h	Util Ratio %	Satn Speed mph	Capacity Adj %	Use Given Cap Adj in Network Analysis	Set As Dominant Lane	Include SLip/ ByPass Lane in Entry Lane Count	Apply Satn Flow Est	Short Lane Capacity	Delay Model Param
No Difference											

Merge Analysis

SITE	Exit Lane	Merge Lane Number	Apply Merge Analysis	Merge Type	Percent Opposing in Short Lane %	Percent Opposing in Merge Lane %	Critical Gap sec	Follow-up Headway sec	Minimum Departures veh/min
No Difference									

Lane Movements - Flow Proportions

SITE	Exit Lane	To Exit Leg South %	East %	North %	West %
Light Vehicles (LV)					
From: South	App. Lane 1				
AM 2047 Reighmoor	Exit Lane 1	-	100	100	100
Defaults - US HCM (Customary)	Exit Lane 1	-	-	100	100
From: East	App. Lane 1				
AM 2047 Reighmoor	Exit Lane 1	100	-	100	100
Defaults - US HCM (Customary)	Exit Lane 1	100	-	-	100
From: North	App. Lane 1				
AM 2047 Reighmoor	Exit Lane 1	100	100	-	100
Defaults - US HCM (Customary)	Exit Lane 1	100	100	-	-
From: West	App. Lane 1				
AM 2047 Reighmoor	Exit Lane 1	100	100	100	-
Defaults - US HCM (Customary)	Exit Lane 1	-	100	100	-
Heavy Vehicles (HV)					
From: South	App. Lane 1				

AM 2047 Reighmoor	Exit Lane 1	-	100	100	100
Defaults - US HCM (Customary)	Exit Lane 1	-	-	100	100
From: East	App. Lane 1				
AM 2047 Reighmoor	Exit Lane 1	100	-	100	100
Defaults - US HCM (Customary)	Exit Lane 1	100	-	-	100
From: North	App. Lane 1				
AM 2047 Reighmoor	Exit Lane 1	100	100	-	100
Defaults - US HCM (Customary)	Exit Lane 1	100	100	-	-
From: West	App. Lane 1				
AM 2047 Reighmoor	Exit Lane 1	100	100	100	-
Defaults - US HCM (Customary)	Exit Lane 1	-	100	100	-

Lane Movements - Blockage Calibration

SITE	Exit Lane	To Exit Leg South	East	North	West
From: South	App. Lane 1				
AM 2047 Reighmoor	Exit Lane 1	-	1	1	1
Defaults - US HCM (Customary)	Exit Lane 1	-	-	1	1
From: East	App. Lane 1				
AM 2047 Reighmoor	Exit Lane 1	1	-	1	1
Defaults - US HCM (Customary)	Exit Lane 1	1	-	-	1
From: North	App. Lane 1				
AM 2047 Reighmoor	Exit Lane 1	1	1	-	1
Defaults - US HCM (Customary)	Exit Lane 1	1	1	-	-
From: West	App. Lane 1				
AM 2047 Reighmoor	Exit Lane 1	1	1	1	-
Defaults - US HCM (Customary)	Exit Lane 1	-	1	1	-

Roundabouts - Options

SITE	AM 2047 Reighmoor	Defaults - US HCM (Customary)
	No Difference	

Roundabouts - Geometry

SITE	Location	Name	Circ. Lanes	Circ. Width	Island Diameter	Inscribed Diameter	Entry Radius	Entry Angle	Raindrop Design	Circ Trans Line	Downstream Circ Lanes
				ft	ft	ft	ft	°			
AM 2047 Reighmoor	South	Reighmoor Rd	1	20	100	-	100	30	No	No	-
Defaults - US HCM (Customary)	South	RoadName	2	30	100	-	65	30	No	No	-
AM 2047 Reighmoor	East	STH 21	1	20	100	-	100	30	No	No	-
Defaults - US HCM (Customary)	East	RoadName	2	30	100	-	65	30	No	No	-
AM 2047 Reighmoor	North	Reighmoor Rd	1	20	100	-	100	30	No	No	-
Defaults - US HCM (Customary)	North	RoadName	2	30	100	-	65	30	No	No	-
AM 2047 Reighmoor	West	STH 21	1	20	100	-	100	30	No	No	-
Defaults - US HCM (Customary)	West	RoadName	2	30	100	-	65	30	No	No	-

HCM 2010 Roundabout Model Parameters

SITE	Location	Name	Single L.Circ: Single L.Entry		Single L.Circ: Multi L.Entry		Multi L.Circ: Single L.Entry		Multi L.Circ: Dominant Lane		Multi L.Circ: Subdominant Lane	
			Para. A	Para. B	Para. A	Para. B	Para. A	Para. B	Para. A	Para. B	Para. A	Para. B
AM 2047 Reighmoor	South	Reighmoor Rd	1385	0.000944	1420	0.00091	1420	0.00085	1420	0.000833	1350	0.000917
Defaults - US HCM (Customary)	South	RoadName	1380	0.00102	1420	0.00091	1420	0.00085	1420	0.00085	1350	0.00092
AM 2047 Reighmoor	East	STH 21	1385	0.000944	1420	0.00091	1420	0.00085	1420	0.000833	1350	0.000917
Defaults - US HCM (Customary)	East	RoadName	1380	0.00102	1420	0.00091	1420	0.00085	1420	0.00085	1350	0.00092
AM 2047 Reighmoor	North	Reighmoor Rd	1385	0.000944	1420	0.00091	1420	0.00085	1420	0.000833	1350	0.000917
Defaults - US HCM (Customary)	North	RoadName	1380	0.00102	1420	0.00091	1420	0.00085	1420	0.00085	1350	0.00092
AM 2047 Reighmoor	West	STH 21	1385	0.000944	1420	0.00091	1420	0.00085	1420	0.000833	1350	0.000917
Defaults - US HCM (Customary)	West	RoadName	1380	0.00102	1420	0.00091	1420	0.00085	1420	0.00085	1350	0.00092

HCM 6 Roundabout Model Calibration

SITE	Location	Name	Model Calib. Factor (HCM6)	Entry/Circ. Flow Adjust. (HCM6)
AM 2047 Reighmoor	South	Reighmoor Rd	1	None
Defaults - US HCM (Customary)	South	RoadName	1	None
AM 2047 Reighmoor	East	STH 21	1	None
Defaults - US HCM (Customary)	East	RoadName	1	None
AM 2047 Reighmoor	North	Reighmoor Rd	1	None
Defaults - US HCM (Customary)	North	RoadName	1	None
AM 2047 Reighmoor	West	STH 21	1	None
Defaults - US HCM (Customary)	West	RoadName	1	None

Pedestrians - Pedestrian Movements

SITE	Main Crossing/ Slip/Bypass Lane Crossing	Volume ped	Peak Flow %	Flow Scale %	Growth Rate %
No Difference					

Pedestrians - Pedestrian Movement Data

SITE	Main Crossing/ Slip/Bypass Lane Crossing	Mov. ID	Crossing Distance ft	Conflict Zone Length ft	Oppng Ped.Fac.	P.Deg. Satn	Walking Speed ft/sec	App. Trav. Distance ft	Downst. Distance ft	Queue Space ft	Cr. Setback Distance
No Difference											

Volumes - Volume Data Settings

SITE	AM 2047 Reighmoor	Defaults - US HCM (Customary)
No Difference		

Volumes - Vehicle Volumes

SITE	Movement Class	To Exit Leg
NA		

Volumes - Volume Factors

SITE	To Approach	Peak Flow Factor %	Flow Scale %	Growth Rate %/year
No Difference				

Gap Acceptance - Gap Acceptance Data

SITE	Opposed Movement	Critical Gap sec	Follow-up Headway sec	Minimum Departures veh/min	Exiting Flow Effect %	% Opp. By Nearest Lane %	Opng. Peds (UnSig)
No Difference							

Gap Acceptance - Settings

Gap Acceptance Options
No Difference

Gap Acceptance Data for Specific Applications					
SITE	Critical Gap sec	Follow-up Headway sec	Minimum Departures veh/min	Exiting Flow Effect %	% Opp. By Nearest Lane %
No Difference					

Merge Analysis & Zebra Crossing Analysis Parameters						
SITE	Movement Class	Parameter	Zebra Crossing on Slip/Bypass Lane	Midblock Zebra Crossing	Merge Analysis [Exit Short Lane	Merge Lane]
No Difference						

Vehicle Movement Data - Path Data

SITE	Turn	Approach Cruise Speed mph	Exit Cruise Speed mph	Negotiation Speed mph	Negotiation Distance ft	Downstream Distance ft	Negotiation Radius ft
No Difference							

Vehicle Movement Data - Calibration

SITE	Turn	Queue Space ft	Vehicle Length ft	Vehicle Occupancy pers/veh	Turn Veh Effect [Factor	Radius] ft	Gap Accp Factor	Opng. Veh Factor	Prac. Deg. Of Satn.
No Difference									

Site Demand & Sensitivity

SITE	AM 2047 Reighmoor	Defaults - US HCM (Customary)
No Difference		

Parameter Settings - Options

SITE	AM 2047 Reighmoor	Defaults - US HCM (Customary)
No Difference		

Parameter Settings - Model Parameters

SITE	AM 2047 Reighmoor	Defaults - US HCM (Customary)
No Difference		

Parameter Settings - Cost

Efficiency Parameters			
SITE	Movement Class	Desired Speed mph	Lower Limit of Speed Efficiency for TTI
No Difference			

Vehicle Cost Parameters							
			Veh Operating Cost			Veh Time Cost	
SITE	Movement Class	Veh Cost Method	[Pump Price of Fuel $/Gal	Fuel Res. Cost Factor	Ratio of Running Cost to Fuel Cost]	[Avg. Income $/h	Time Value Factor]
AM 2047 Reighmoor	Light Vehicles (LV)	Operating Cost	2.3	0.7	3	27	0.4
Defaults - US HCM (Customary)	Light Vehicles (LV)	Operating Cost	2.5	0.7	3	29	0.4
AM 2047 Reighmoor	Heavy Vehicles (HV)	Operating Cost	2.3	0.7	3	27	0.4
Defaults - US HCM (Customary)	Heavy Vehicles (HV)	Operating Cost	2.5	0.7	3	29	0.4

Cost Options		
SITE	AM 2047 Reighmoor	Defaults - US HCM (Customary)
No Difference		

Pedestrian Cost Parameters
SITE
Not Applicable

Parameter Settings - Vehicle Parameters

SITE	Movement Class	Vehicle Parameters		CO2 to Fuel Rate
		Mass lb	Max Power kW	
No Difference				

Parameter Settings - Fuel Consumption

SITE	Movement Class	Fuel & Emission Model Parameters			
		fi	A	B	Beta
No Difference					

Parameter Settings - CO Emission

SITE	Movement Class	Fuel & Emission Model Parameters			
		fi	A	B	Beta
No Difference					

Parameter Settings - HC Emission

SITE	Movement Class	Fuel & Emission Model Parameters			
		fi	A	B	Beta
No Difference					

Parameter Settings - NOx Emission

SITE	Movement Class	Fuel & Emission Model Parameters			
		fi	A	B	Beta
No Difference					

Parameter Settings - Advanced

SITE	AM 2047 Reighmoor	Defaults - US HCM (Customary)
No Difference		

MOVEMENT SUMMARY

Site: 101 [AM 2047 Reighmoor (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Reighmoor Rd														
3	L2	30	3.0	33	3.0	0.116	6.0	LOS A	0.4	11.1	0.55	0.51	0.55	33.6
8	T1	4	3.0	4	3.0	0.116	6.0	LOS A	0.4	11.1	0.55	0.51	0.55	33.6
18	R2	46	3.0	50	3.0	0.116	6.0	LOS A	0.4	11.1	0.55	0.51	0.55	32.6
Approach		80	3.0	87	3.0	0.116	6.0	LOS A	0.4	11.1	0.55	0.51	0.55	33.0
East: STH 21														
1	L2	16	3.0	17	3.0	0.259	5.1	LOS A	1.3	32.8	0.18	0.07	0.18	35.1
6	T1	287	3.0	312	3.0	0.259	5.1	LOS A	1.3	32.8	0.18	0.07	0.18	35.1
16	R2	3	3.0	3	3.0	0.259	5.1	LOS A	1.3	32.8	0.18	0.07	0.18	34.0
Approach		306	3.0	333	3.0	0.259	5.1	LOS A	1.3	32.8	0.18	0.07	0.18	35.0
North: Reighmoor Rd														
7	L2	22	3.0	24	3.0	0.076	4.5	LOS A	0.3	7.4	0.43	0.32	0.43	34.5
4	T1	15	3.0	16	3.0	0.076	4.5	LOS A	0.3	7.4	0.43	0.32	0.43	34.5
14	R2	29	3.0	32	3.0	0.076	4.5	LOS A	0.3	7.4	0.43	0.32	0.43	33.5
Approach		66	3.0	72	3.0	0.076	4.5	LOS A	0.3	7.4	0.43	0.32	0.43	34.0
West: STH 21														
5	L2	9	3.0	10	3.0	0.479	7.8	LOS A	3.2	82.2	0.27	0.12	0.27	33.8
2	T1	518	3.0	563	3.0	0.479	7.8	LOS A	3.2	82.2	0.27	0.12	0.27	33.7
12	R2	33	3.0	36	3.0	0.479	7.8	LOS A	3.2	82.2	0.27	0.12	0.27	32.8
Approach		560	3.0	609	3.0	0.479	7.8	LOS A	3.2	82.2	0.27	0.12	0.27	33.7
All Vehicles		1012	3.0	1100	3.0	0.479	6.6	LOS A	3.2	82.2	0.27	0.15	0.27	34.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

Site: 101 [AM 2047 Reighmoor (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Reighmoor Rd													
Lane 1[d]	87	3.0	753	0.116	100	6.0	LOS A	0.4	11.1	Full	1600	0.0	0.0
Approach	87	3.0		0.116		6.0	LOS A	0.4	11.1				
East: STH 21													
Lane 1[d]	333	3.0	1285	0.259	100	5.1	LOS A	1.3	32.8	Full	1600	0.0	0.0
Approach	333	3.0		0.259		5.1	LOS A	1.3	32.8				
North: Reighmoor Rd													
Lane 1[d]	72	3.0	946	0.076	100	4.5	LOS A	0.3	7.4	Full	1600	0.0	0.0
Approach	72	3.0		0.076		4.5	LOS A	0.3	7.4				
West: STH 21													
Lane 1[d]	609	3.0	1271	0.479	100	7.8	LOS A	3.2	82.2	Full	1600	0.0	0.0
Approach	609	3.0		0.479		7.8	LOS A	3.2	82.2				
Intersection	1100	3.0		0.479		6.6	LOS A	3.2	82.2				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Reighmoor Rd

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	33	4	50	87	3.0	753	0.116	100	NA	NA
Approach	33	4	50	87	3.0		0.116			

East: STH 21

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	17	312	3	333	3.0	1285	0.259	100	NA	NA
Approach	17	312	3	333	3.0		0.259			

North: Reighmoor Rd										
Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	24	16	32	72	3.0	946	0.076	100	NA	NA
Approach	24	16	32	72	3.0		0.076			
West: STH 21										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	10	563	36	609	3.0	1271	0.479	100	NA	NA
Approach	10	563	36	609	3.0		0.479			

	Total	%HV	Deg.Satn (v/c)
Intersection	1100	3.0	0.479

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

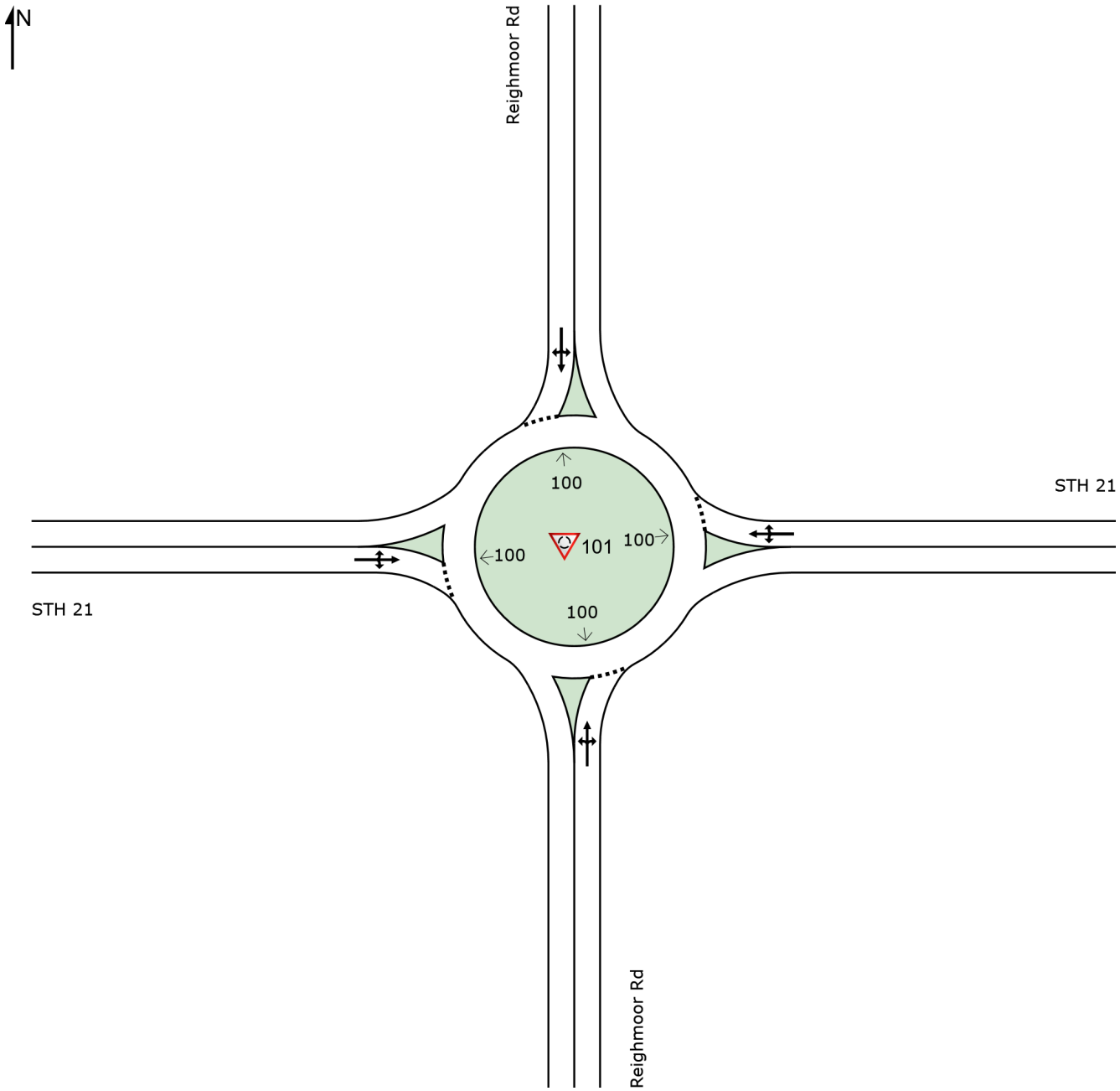
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Reighmoor Rd Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: STH 21 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: Reighmoor Rd Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: STH 21 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

SITE LAYOUT

Site: 101 [PM 2047 Reighmoor (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT FLOWS FOR SITE (INPUT)

Approach movement input flow rates (veh/h)

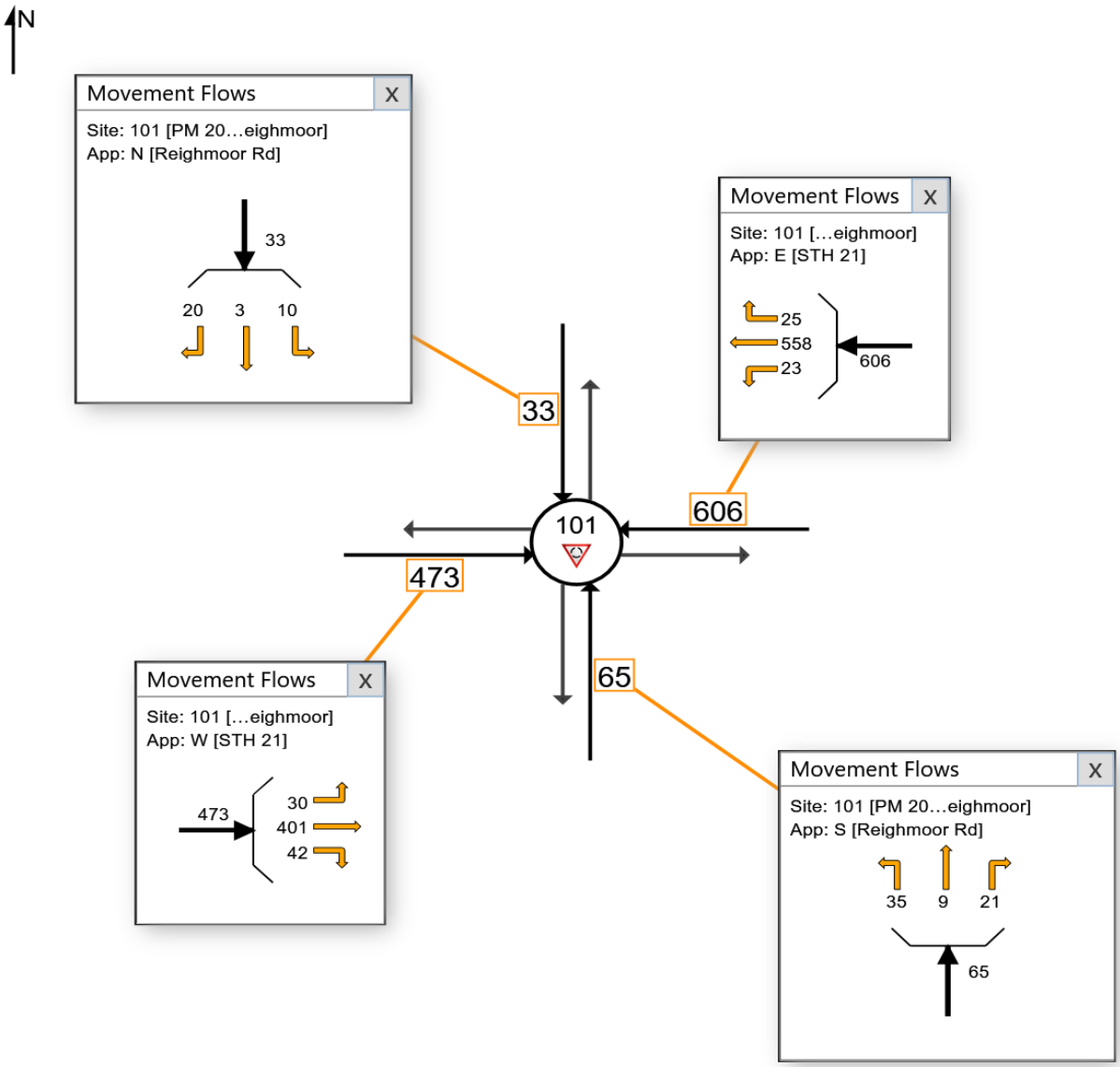
All Movement Classes

Site: 101 [PM 2047 Reighmoor (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
Click and drag popup boxes to move to preferred positions.

Close All Popups



INPUT COMPARISON

Site A: 101 [PM 2047 Reighmoor (Site Folder: General)]

Site B:

Intersection - Site Data

SITE	PM 2047 Reighmoor	Defaults - US HCM (Customary)
No Difference		

Intersection - Site Properties

SITE	PM 2047 Reighmoor	Defaults - US HCM (Customary)
NA		

Intersection - Approach & Exit Data

SITE	Location	Name	Type	No. of App. Lanes	No. of Exit Lanes	Approach Distance ft	Extra Bunching (Site Analysis) %	Extra Bunching (Network Analysis) %	Exit Distance ft	Approach Control	Area Type Factor
PM 2047 Reighmoor	South	Reighmoor Rd	Two Way	1	1	1600.0	0	-	-	Yield	-
Defaults - US HCM (Customary)	South	RoadName	Two Way	1	1	1600.0	0	-	-	Yield	-
PM 2047 Reighmoor	East	STH 21	Two Way	1	1	1600.0	0	-	-	Yield	-
Defaults - US HCM (Customary)	East	RoadName	Two Way	1	1	1600.0	0	-	-	Yield	-
PM 2047 Reighmoor	North	Reighmoor Rd	Two Way	1	1	1600.0	0	-	-	Yield	-
Defaults - US HCM (Customary)	North	RoadName	Two Way	1	1	1600.0	0	-	-	Yield	-
PM 2047 Reighmoor	West	STH 21	Two Way	1	1	1600.0	0	-	-	Yield	-
Defaults - US HCM (Customary)	West	RoadName	Two Way	1	1	1600.0	0	-	-	Yield	-

Movement Definitions - Included Movement Classes

SITE	Included	Name	ID	Model Designation
No Difference				

Movement Definitions - Origin-Destination Movements

SITE	To Approach	Turn	OD Mov ID
No Difference			

SITE	U-Turn Before Intersection	Exclude U-Turn Before Intersection From Signal Analysis
No Difference		

Lane Geometry - Lane Configuration

SITE	Leg Item	Config	Type	Control	Slip/ Bypass Control	Length	Width	Grade	Island [Front Width	Back Width	Fill Style	Cnct To	For Ped Stgn	Short Strip Isl]

	ft	ft	%	ft	ft
No Difference					

Lane Geometry - Lane Disciplines

SITE	To Approach	Turn	Free Queue Distance ft	Movement Class(es)
No Difference				

Lane Geometry - Lane Disciplines - Lane Change Data

SITE	Movement Class	% Lane Change to Left %	% Lane Change to Right %
No Difference			

Lane Geometry - Lane Data

Approach Lane Data

SITE	Approach Lane	Basic Satn Flow tcu/h	Util Ratio %	Satn Speed mph	Capacity Adj %	Use Given Cap Adj in Network Analysis	Set As Dominant Lane	Include SLip/ ByPass Lane in Entry Lane Count	Apply Satn Flow Est	Short Lane Capacity	Delay Model Param
No Difference											

Merge Analysis

SITE	Exit Lane	Merge Lane Number	Apply Merge Analysis	Merge Type	Percent Opposing in Short Lane %	Percent Opposing in Merge Lane %	Critical Gap sec	Follow-up Headway sec	Minimum Departures veh/min
No Difference									

Lane Movements - Flow Proportions

SITE	Exit Lane	To Exit Leg South %	East %	North %	West %
Light Vehicles (LV)					
From: South	App. Lane 1				
PM 2047 Reighmoor	Exit Lane 1	-	100	100	100
Defaults - US HCM (Customary)	Exit Lane 1	-	-	100	100
From: East	App. Lane 1				
PM 2047 Reighmoor	Exit Lane 1	100	-	100	100
Defaults - US HCM (Customary)	Exit Lane 1	100	-	-	100
From: North	App. Lane 1				
PM 2047 Reighmoor	Exit Lane 1	100	100	-	100
Defaults - US HCM (Customary)	Exit Lane 1	100	100	-	-
From: West	App. Lane 1				
PM 2047 Reighmoor	Exit Lane 1	100	100	100	-
Defaults - US HCM (Customary)	Exit Lane 1	-	100	100	-
Heavy Vehicles (HV)					
From: South	App. Lane 1				

PM 2047 Reighmoor	Exit Lane 1	-	100	100	100
Defaults - US HCM (Customary)	Exit Lane 1	-	-	100	100
From: East	App. Lane 1				
PM 2047 Reighmoor	Exit Lane 1	100	-	100	100
Defaults - US HCM (Customary)	Exit Lane 1	100	-	-	100
From: North	App. Lane 1				
PM 2047 Reighmoor	Exit Lane 1	100	100	-	100
Defaults - US HCM (Customary)	Exit Lane 1	100	100	-	-
From: West	App. Lane 1				
PM 2047 Reighmoor	Exit Lane 1	100	100	100	-
Defaults - US HCM (Customary)	Exit Lane 1	-	100	100	-

Lane Movements - Blockage Calibration

SITE	Exit Lane	To Exit Leg South	East	North	West
From: South	App. Lane 1				
PM 2047 Reighmoor	Exit Lane 1	-	1	1	1
Defaults - US HCM (Customary)	Exit Lane 1	-	-	1	1
From: East	App. Lane 1				
PM 2047 Reighmoor	Exit Lane 1	1	-	1	1
Defaults - US HCM (Customary)	Exit Lane 1	1	-	-	1
From: North	App. Lane 1				
PM 2047 Reighmoor	Exit Lane 1	1	1	-	1
Defaults - US HCM (Customary)	Exit Lane 1	1	1	-	-
From: West	App. Lane 1				
PM 2047 Reighmoor	Exit Lane 1	1	1	1	-
Defaults - US HCM (Customary)	Exit Lane 1	-	1	1	-

Roundabouts - Options

SITE	PM 2047 Reighmoor	Defaults - US HCM (Customary)
	No Difference	

Roundabouts - Geometry

SITE	Location	Name	Circ. Lanes	Circ. Width	Island Diameter	Inscribed Diameter	Entry Radius	Entry Angle	Raindrop Design	Circ Trans Line	Downstream Circ Lanes
				ft	ft	ft	ft	°			
PM 2047 Reighmoor	South	Reighmoor Rd	1	20	100	-	100	30	No	No	-
Defaults - US HCM (Customary)	South	RoadName	2	30	100	-	65	30	No	No	-
PM 2047 Reighmoor	East	STH 21	1	20	100	-	100	30	No	No	-
Defaults - US HCM (Customary)	East	RoadName	2	30	100	-	65	30	No	No	-
PM 2047 Reighmoor	North	Reighmoor Rd	1	20	100	-	100	30	No	No	-
Defaults - US HCM (Customary)	North	RoadName	2	30	100	-	65	30	No	No	-
PM 2047 Reighmoor	West	STH 21	1	20	100	-	100	30	No	No	-
Defaults - US HCM (Customary)	West	RoadName	2	30	100	-	65	30	No	No	-

HCM 2010 Roundabout Model Parameters

SITE	Location	Name	Single L.Circ: Single L.Entry		Single L.Circ: Multi L.Entry		Multi L.Circ: Single L.Entry		Multi L.Circ: Dominant Lane		Multi L.Circ: Subdominant Lane	
			Para. A	Para. B	Para. A	Para. B	Para. A	Para. B	Para. A	Para. B	Para. A	Para. B
PM 2047 Reighmoor	South	Reighmoor Rd	1385	0.000944	1420	0.00091	1420	0.00085	1420	0.00085	1350	0.00092
Defaults - US HCM (Customary)	South	RoadName	1380	0.00102	1420	0.00091	1420	0.00085	1420	0.00085	1350	0.00092
PM 2047 Reighmoor	East	STH 21	1385	0.000944	1420	0.00091	1420	0.00085	1420	0.00085	1350	0.00092
Defaults - US HCM (Customary)	East	RoadName	1380	0.00102	1420	0.00091	1420	0.00085	1420	0.00085	1350	0.00092
PM 2047 Reighmoor	North	Reighmoor Rd	1385	0.000944	1420	0.00091	1420	0.00085	1420	0.00085	1350	0.00092
Defaults - US HCM (Customary)	North	RoadName	1380	0.00102	1420	0.00091	1420	0.00085	1420	0.00085	1350	0.00092
PM 2047 Reighmoor	West	STH 21	1385	0.000944	1420	0.00091	1420	0.00085	1420	0.00085	1350	0.00092
Defaults - US HCM (Customary)	West	RoadName	1380	0.00102	1420	0.00091	1420	0.00085	1420	0.00085	1350	0.00092

HCM 6 Roundabout Model Calibration

SITE	Location	Name	Model Calib. Factor (HCM6)	Entry/Circ. Flow Adjust. (HCM6)
PM 2047 Reighmoor	South	Reighmoor Rd	1	None
Defaults - US HCM (Customary)	South	RoadName	1	None
PM 2047 Reighmoor	East	STH 21	1	None
Defaults - US HCM (Customary)	East	RoadName	1	None
PM 2047 Reighmoor	North	Reighmoor Rd	1	None
Defaults - US HCM (Customary)	North	RoadName	1	None
PM 2047 Reighmoor	West	STH 21	1	None
Defaults - US HCM (Customary)	West	RoadName	1	None

Pedestrians - Pedestrian Movements

SITE	Main Crossing/ Slip/Bypass Lane Crossing	Volume ped	Peak Flow %	Flow Scale %	Growth Rate %
No Difference					

Pedestrians - Pedestrian Movement Data

SITE	Main Crossing/ Slip/Bypass Lane Crossing	Mov. ID	Crossing Distance ft	Conflict Zone Length ft	Oppng Ped.Fac.	P.Deg. Satn	Walking Speed ft/sec	App. Trav. Distance ft	Downst. Distance ft	Queue Space ft	Cr. Setback Distance
No Difference											

Volumes - Volume Data Settings

SITE	PM 2047 Reighmoor	Defaults - US HCM (Customary)
No Difference		

Volumes - Vehicle Volumes

SITE	Movement Class	To Exit Leg
NA		

Volumes - Volume Factors

SITE	To Approach	Peak Flow Factor %	Flow Scale %	Growth Rate %/year
No Difference				

Gap Acceptance - Gap Acceptance Data

SITE	Opposed Movement	Critical Gap sec	Follow-up Headway sec	Minimum Departures veh/min	Exiting Flow Effect %	% Opp. By Nearest Lane %	Opng. Peds (UnSig)
No Difference							

Gap Acceptance - Settings

Gap Acceptance Options

No Difference

Gap Acceptance Data for Specific Applications

SITE	Critical Gap sec	Follow-up Headway sec	Minimum Departures veh/min	Exiting Flow Effect %	% Opp. By Nearest Lane %
No Difference					

Merge Analysis & Zebra Crossing Analysis Parameters

SITE	Movement Class	Parameter	Zebra Crossing on Slip/Bypass Lane	Midblock Zebra Crossing	Merge Analysis [Exit Short Lane	Merge Lane]
No Difference						

Vehicle Movement Data - Path Data

SITE	Turn	Approach Cruise Speed mph	Exit Cruise Speed mph	Negotiation Speed mph	Negotiation Distance ft	Downstream Distance ft	Negotiation Radius ft
No Difference							

Vehicle Movement Data - Calibration

SITE	Turn	Queue Space ft	Vehicle Length ft	Vehicle Occupancy pers/veh	Turn Veh Effect [Factor	Radius] ft	Gap Accp Factor	Opng. Veh Factor	Prac. Deg. Of Satn.
No Difference									

Site Demand & Sensitivity

SITE	PM 2047 Reighmoor	Defaults - US HCM (Customary)
No Difference		

Parameter Settings - Options

SITE	PM 2047 Reighmoor	Defaults - US HCM (Customary)
No Difference		

Parameter Settings - Model Parameters

SITE	PM 2047 Reighmoor	Defaults - US HCM (Customary)
No Difference		

Parameter Settings - Cost

Efficiency Parameters

SITE	Movement Class	Desired Speed mph	Lower Limit of Speed Efficiency for TTI
No Difference			

Vehicle Cost Parameters

SITE	Movement Class	Veh Cost Method	Veh Operating Cost [Pump Price of Fuel $/Gal	Fuel Res. Cost Factor	Ratio of Running Cost to Fuel Cost]	Veh Time Cost [Avg. Income $/h	Time Value Factor]
PM 2047 Reighmoor	Light Vehicles (LV)	Operating Cost	2.3	0.7	3	27	0.4
Defaults - US HCM (Customary)	Light Vehicles (LV)	Operating Cost	2.5	0.7	3	29	0.4
PM 2047 Reighmoor	Heavy Vehicles (HV)	Operating Cost	2.3	0.7	3	27	0.4
Defaults - US HCM (Customary)	Heavy Vehicles (HV)	Operating Cost	2.5	0.7	3	29	0.4

Cost Options		
SITE	PM 2047 Reighmoor	Defaults - US HCM (Customary)
No Difference		
Pedestrian Cost Parameters		
SITE		
Not Applicable		

Parameter Settings - Vehicle Parameters

		Vehicle Parameters		
SITE	Movement Class	Mass lb	Max Power kW	CO2 to Fuel Rate
No Difference				

Parameter Settings - Fuel Consumption

		Fuel & Emission Model Parameters			
SITE	Movement Class	fi	A	B	Beta
No Difference					

Parameter Settings - CO Emission

		Fuel & Emission Model Parameters			
SITE	Movement Class	fi	A	B	Beta
No Difference					

Parameter Settings - HC Emission

		Fuel & Emission Model Parameters			
SITE	Movement Class	fi	A	B	Beta
No Difference					

Parameter Settings - NOx Emission

		Fuel & Emission Model Parameters			
SITE	Movement Class	fi	A	B	Beta
No Difference					

Parameter Settings - Advanced

SITE	PM 2047 Reighmoor	Defaults - US HCM (Customary)
No Difference		

MOVEMENT SUMMARY

Site: 101 [PM 2047 Reighmoor (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Reighmoor Rd														
3	L2	35	3.0	38	3.0	0.084	5.1	LOS A	0.3	8.1	0.49	0.41	0.49	33.6
8	T1	9	3.0	10	3.0	0.084	5.1	LOS A	0.3	8.1	0.49	0.41	0.49	33.6
18	R2	21	3.0	23	3.0	0.084	5.1	LOS A	0.3	8.1	0.49	0.41	0.49	32.6
Approach		65	3.0	71	3.0	0.084	5.1	LOS A	0.3	8.1	0.49	0.41	0.49	33.3
East: STH 21														
1	L2	23	3.0	25	3.0	0.530	8.8	LOS A	3.8	97.0	0.35	0.18	0.35	33.3
6	T1	558	3.0	607	3.0	0.530	8.8	LOS A	3.8	97.0	0.35	0.18	0.35	33.2
16	R2	25	3.0	27	3.0	0.530	8.8	LOS A	3.8	97.0	0.35	0.18	0.35	32.3
Approach		606	3.0	659	3.0	0.530	8.8	LOS A	3.8	97.0	0.35	0.18	0.35	33.2
North: Reighmoor Rd														
7	L2	10	3.0	11	3.0	0.051	5.7	LOS A	0.2	4.7	0.55	0.49	0.55	34.0
4	T1	3	3.0	3	3.0	0.051	5.7	LOS A	0.2	4.7	0.55	0.49	0.55	33.9
14	R2	20	3.0	22	3.0	0.051	5.7	LOS A	0.2	4.7	0.55	0.49	0.55	32.9
Approach		33	3.0	36	3.0	0.051	5.7	LOS A	0.2	4.7	0.55	0.49	0.55	33.3
West: STH 21														
5	L2	30	3.0	33	3.0	0.397	6.6	LOS A	2.4	60.9	0.19	0.07	0.19	34.3
2	T1	401	3.0	436	3.0	0.397	6.6	LOS A	2.4	60.9	0.19	0.07	0.19	34.2
12	R2	42	3.0	46	3.0	0.397	6.6	LOS A	2.4	60.9	0.19	0.07	0.19	33.2
Approach		473	3.0	514	3.0	0.397	6.6	LOS A	2.4	60.9	0.19	0.07	0.19	34.1
All Vehicles		1177	3.0	1279	3.0	0.530	7.6	LOS A	3.8	97.0	0.30	0.16	0.30	33.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

Site: 101 [PM 2047 Reighmoor (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Reighmoor Rd													
Lane 1[d]	71	3.0	844	0.084	100	5.1	LOS A	0.3	8.1	Full	1600	0.0	0.0
Approach	71	3.0		0.084		5.1	LOS A	0.3	8.1				
East: STH 21													
Lane 1[d]	659	3.0	1244	0.530	100	8.8	LOS A	3.8	97.0	Full	1600	0.0	0.0
Approach	659	3.0		0.530		8.8	LOS A	3.8	97.0				
North: Reighmoor Rd													
Lane 1[d]	36	3.0	701	0.051	100	5.7	LOS A	0.2	4.7	Full	1600	0.0	0.0
Approach	36	3.0		0.051		5.7	LOS A	0.2	4.7				
West: STH 21													
Lane 1[d]	514	3.0	1294	0.397	100	6.6	LOS A	2.4	60.9	Full	1600	0.0	0.0
Approach	514	3.0		0.397		6.6	LOS A	2.4	60.9				
Intersection	1279	3.0		0.530		7.6	LOS A	3.8	97.0				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Reighmoor Rd

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	38	10	23	71	3.0	844	0.084	100	NA	NA
Approach	38	10	23	71	3.0		0.084			

East: STH 21

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	25	607	27	659	3.0	1244	0.530	100	NA	NA
Approach	25	607	27	659	3.0		0.530			

North: Reighmoor Rd										
Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	11	3	22	36	3.0	701	0.051	100	NA	NA
Approach	11	3	22	36	3.0		0.051			
West: STH 21										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	33	436	46	514	3.0	1294	0.397	100	NA	NA
Approach	33	436	46	514	3.0		0.397			
	Total	%HV	Deg.Satn (v/c)							
Intersection	1279	3.0		0.530						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Reighmoor Rd Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: STH 21 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: Reighmoor Rd Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: STH 21 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										