

Bridge Design Speed Investigation

Bridge #20 on SR 1809 (Sunnyside Road) over Raccoon Creek
Haywood County



Document Prepared By:

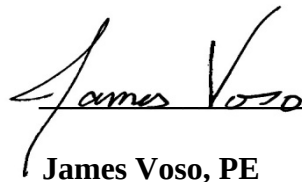
Mattern & Craig, Inc.
Consulting Engineers - Surveyors
12 Broad Street
Asheville, NC 28801
(828) 254-2201
FAX: (828) 254-4562

Commission No: 3356

June 26, 2013



Investigating Engineer


James Voso, PE

Bridge and Approach Investigation Checklist

Project 17BP.14.PE.1
Description Replace Bridge #20 on SR 1809 (Sunnyside Road) over Raccoon Creek
Route SR 1809 (Sunnyside Road)
Division 14
County Haywood

Existing Speed Limit 35 mph ☒ Posted ☐ Statutory

Reasonable & Comfortable
Passenger Car Speed 20 mph

Speed Data N/A

Ball Bank Speed Study Curve west of Bridge #20 had a ball bank indication of 12 at 20 mph.

Warning Signs at Bridge 4 Bridge End Delineators, Weight Limit not posted

Roadside Development Residence in southeast quadrant of bridge. Farm land in all other quadrants of bridge.

ADT History 480 (2010), 520 (2008), 490 (2006), 640 (2004)

Pedestrian/Bicycle Traffic Low

Bridge and Approach
Digital Photos (attached)

Approach Lane Width 8'

Approach Shoulder Width: 6.5'
Shoulder Type grass

Lane Width (existing bridge) 7'

Shoulder width (existing bridge) 2.5'

Strategic Corridor / Thoroughfare
Designation and Recommended
Cross Section Not a Strategic Corridor/Thoroughfare. Two lane cross section at 20 mph based on 3R guidelines.

Crash History and
Safety Considerations Two crashes (one "Fixed Object" and one "Overturn/Rollover") near bridge (4/1/2003 - 3/31/2013, 10 years).

Comments Driveway located near east end of bridge. Bridge number posted on bridge.

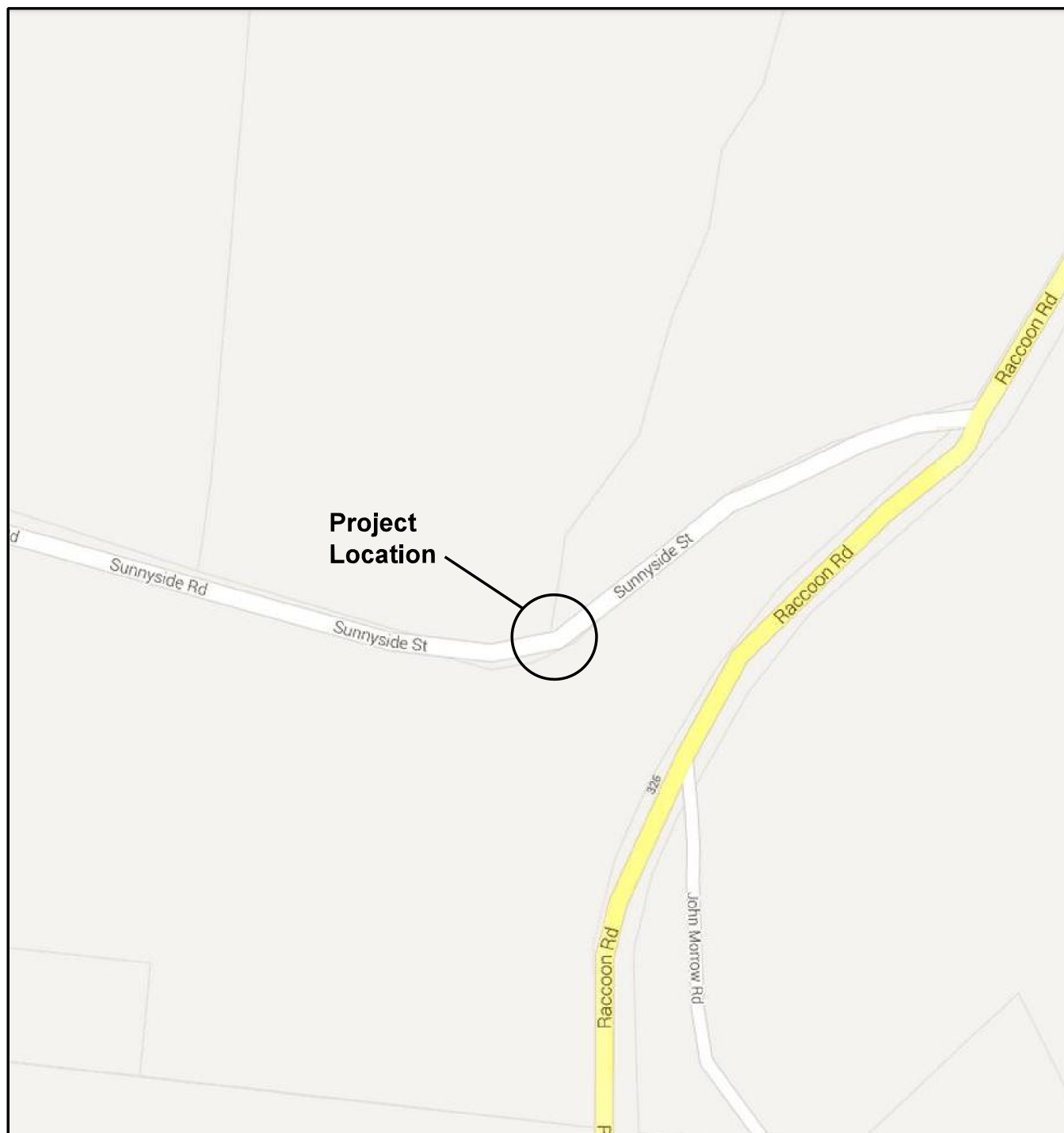
Reasonable Bridge Speed 20 mph

Investigated by: Mathew Bolden Reviewed by: James Voso

Bridge #20

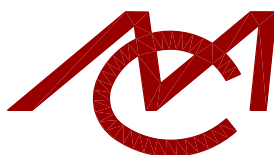
Haywood County

Division 14



VICINITY MAP

Bridge #20 on SR 1809
(Sunnyside Road)
over Raccoon Creek



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Bridge #20
Haywood County
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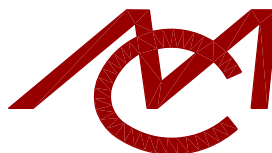


Eastbound Approach



Eastbound Approach at bridge

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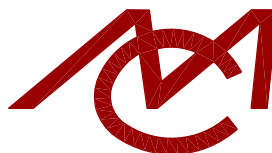


Westbound Approach



Westbound Approach at bridge

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**North Carolina Department of Transportation
Traffic Engineering Accident Analysis System
Strip Analysis Report**

Study Criteria Summary

County: HAYWOOD **City:** All and Rural
Date: 4/1/2003 **to** 3/31/2013 **Study:** HAYWOODBRIDGE20
Location: SR 1809 (Sunnyside Rd) from 500 feet east of Bridge 20 to 500 feet west of the bridge

Report Details

Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries				Condition			Road		Trfc Ctl	
						F	A	B	C	R	L	W	Ch	Ci	Dv	Op
1	101805347	0.052	08/11/2006 12:55	FIXED OBJECT	\$ 3075	0	0	0	1	1	1	2	2	0	13	1
Unit 1 : 1 Alchl/Drgs: 0 Speed: 30 MPH Dir: E Veh Mnvr/Ped Actn: 4 Obj Strk: 61																
2	103313805	0.100	11/27/2011 02:21	OVERTURN/ROLLOVER	\$ 5000	0	0	0	0	1	5	1	3	0	13	1
Unit 1 : 2 Alchl/Drgs: 1 Speed: 35 MPH Dir: N Veh Mnvr/Ped Actn: 4 Obj Strk: 58																

**Legend for
Report
Details:**

Acc No - Accident Number
Injuries: F - Fatal, A - Class A, B - Class B, C - Class C
Condition: R - Road Surface, L - Ambient Light, W - Weather
Rd Ch - Road Character
Rd Ci - Roadway Contributing Circumstances
Trfc Ctl - Traffic Control: Dv - Device, Op - Operating
Alchl/Drgs - Alcohol Drugs Suspected
Veh Mnvr/Ped Actn - Vehicle Maneuver/Pedestrian Action
Obj Strk - Object Struck

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Summary Statistics

High Level Crash Summary

Crash Type	Number of Crashes	Percent of Total
Total Crashes	2	100.00
Fatal Crashes	0	0.00
Non-Fatal Injury Crashes	1	50.00
Total Injury Crashes	1	50.00
Property Damage Only Crashes	1	50.00
Night Crashes	1	50.00
Wet Crashes	0	0.00
Alcohol/Drugs Involvement Crashes	1	50.00

Crash Severity Summary

Crash Type	Number of Crashes	Percent of Total
Total Crashes	2	100.00
Fatal Crashes	0	0.00
Class A Crashes	0	0.00
Class B Crashes	0	0.00
Class C Crashes	1	50.00
Property Damage Only Crashes	1	50.00

Vehicle Exposure Statistics

Annual ADT = 520

Total Length = 0.194 (Miles) 0.312 (Kilometers)

Total Vehicle Exposure = 0.37 (MVMT) 0.59 (MVKMT)

Crash Rate	Crashes Per 100 Million Vehicle Miles	Crashes Per 100 Million Vehicle Kilometers
Total Crash Rate	542.72	337.23
Fatal Crash Rate	0.00	0.00
Non Fatal Crash Rate	271.36	168.62
Night Crash Rate	271.36	168.62
Wet Crash Rate	0.00	0.00
EPDO Rate	2550.78	1584.98

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Strip Analysis Report**

Miscellaneous Statistics

Severity Index =	4.70
EPDO Crash Index =	9.40
Estimated Property Damage Total = \$	8075.00

Accident Type Summary

Accident Type	Number of Crashes	Percent of Total
FIXED OBJECT	1	50.00
OVERTURN/ROLLOVER	1	50.00

Injury Summary

Injury Type	Number of Injuries	Percent of Total
Fatal Injuries	0	0.00
Class A Injuries	0	0.00
Class B Injuries	0	0.00
Class C Injuries	1	100.00
Total Non-Fatal Injuries	1	100.00
Total Injuries	1	100.00

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Monthly Summary

Month	Number of Crashes	Percent of Total
Jan	0	0.00
Feb	0	0.00
Mar	0	0.00
Apr	0	0.00
May	0	0.00
Jun	0	0.00
Jul	0	0.00
Aug	1	50.00
Sep	0	0.00
Oct	0	0.00
Nov	1	50.00
Dec	0	0.00

Daily Summary

Day	Number of Crashes	Percent of Total
Mon	0	0.00
Tue	0	0.00
Wed	0	0.00
Thu	0	0.00
Fri	1	50.00
Sat	0	0.00
Sun	1	50.00

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Hourly Summary

Hour	Number of Crashes	Percent of Total
0000-0059	0	0.00
0100-0159	0	0.00
0200-0259	1	50.00
0300-0359	0	0.00
0400-0459	0	0.00
0500-0559	0	0.00
0600-0659	0	0.00
0700-0759	0	0.00
0800-0859	0	0.00
0900-0959	0	0.00
1000-1059	0	0.00
1100-1159	0	0.00
1200-1259	1	50.00
1300-1359	0	0.00
1400-1459	0	0.00
1500-1559	0	0.00
1600-1659	0	0.00
1700-1759	0	0.00
1800-1859	0	0.00
1900-1959	0	0.00
2000-2059	0	0.00
2100-2159	0	0.00
2200-2259	0	0.00
2300-2359	0	0.00

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Light and Road Conditions Summary

Condition	Dry	Wet	Other	Total
Day	1	0	0	1
Dark	1	0	0	1
Other	0	0	0	0
Total	2	0	0	2

Object Struck Summary

Object Type	Times Struck	Percent of Total
DITCH	1	50.00
FENCE OR FENCE POST	1	50.00

Vehicle Type Summary

Vehicle Type	Number Involved	Percent of Total
PASSENGER CAR	1	50.00
PICKUP	1	50.00

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Yearly Totals Summary

Accident Totals

Year	Total Accidents	Fatal Accidents	Injury Accidents	Property Damage Only Accidents
2003	0	0	0	0
2004	0	0	0	0
2005	0	0	0	0
2006	1	0	1	0
2007	0	0	0	0
2008	0	0	0	0
2009	0	0	0	0
2010	0	0	0	0
2011	1	0	0	1
2012	0	0	0	0
2013	0	0	0	0
Total	2	0	1	1

Injury Totals

Year	Fatal Injuries	Class A, B, or C Injuries
2003	0	0
2004	0	0
2005	0	0
2006	0	1
2007	0	0
2008	0	0
2009	0	0
2010	0	0
2011	0	0
2012	0	0
2013	0	0
Total	0	1

Miscellaneous Totals

Year	Property Damage	EPDO Index
2003	\$ 0	0.00
2004	\$ 0	0.00

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Year	Property Damage	EPDO Index
2005	\$ 0	0.00
2006	\$ 3075	8.40
2007	\$ 0	0.00
2008	\$ 0	0.00
2009	\$ 0	0.00
2010	\$ 0	0.00
2011	\$ 5000	1.00
2012	\$ 0	0.00
2013	\$ 0	0.00
Total	\$ 8075	9.40

Type of Accident Totals

Year	Left Turn	Right Turn	Rear End	Run Off Road & Fixed Object	Angle	Side Swipe	Other
2003	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0
2005	0	0	0	0	0	0	0
2006	0	0	0	1	0	0	0
2007	0	0	0	0	0	0	0
2008	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0
2011	0	0	0	0	0	0	1
2012	0	0	0	0	0	0	0
2013	0	0	0	0	0	0	0
Total	0	0	0	1	0	0	1

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Strip Diagram

Features	Milepost	Crash IDs
Structure:430020	0.03	
	0.04	
	0.05	101805347
	0.06	
	0.07	
	0.08	
	0.09	
	0.10	103313805
	0.11	
	0.12	
	0.13	
	0.14	
	0.15	
	0.16	
	0.17	
	0.18	
	0.19	
	0.20	
	0.21	
	0.22	

**North Carolina Department of Transportation
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Strip Analysis Report**

Study Criteria

Study Name	Log No.	PH No.	TIP No.	K/A Cf.	B/C Cf.	ADT	ADT Route
HAYWOODBRIDGE20				76.8	8.4	520	40001809

Request Date	Courier Service	Phone No.	Ext.	Fax No.
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County			Municipality					
Name	Code	Div.	Name	Code	Y-Line Ft.	Begin Date	End Date	Years
HAYWOOD	43	14	All and Rural		0	4/1/2003	3/31/2013	10.00

Location Text	Requestor
SR 1809 (Sunnyside Rd) from 500 feet east of Bridge 20 to 500 feet west of the bridge	

Fiche Roads	
Name	Code
SR 1809	40001809
EAST	50009213
SUNNYSIDE	50029652

Strip Road					
Name	Code	Begin MP	End MP	Miles	Kilometers
SR 1809	40001809	0.025	0.219	0.194	0.312