

Bridge Design Speed Investigation

Bridge #22 on SR 1001 (Sugar Hill Road) over Second Broad River
McDowell County



Document Prepared By:

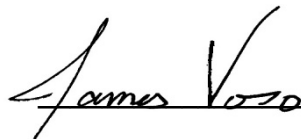
Mattern & Craig, Inc.
Consulting Engineers - Surveyors
12 Broad Street
Asheville, NC 28801
(828) 254-2201
FAX: (828) 254-4562

Commission No: 3350

July 18, 2013



Investigating Engineer


James Voso, PE

Bridge and Approach Investigation Checklist

Project 17BP.13.PE.1
Description Replace Bridge #22 on SR 1001 (Sugar Hill Road) over Second Broad River
Route SR 1001 (Sugar Hill Road)
Division 13
County McDowell

Existing Speed Limit 55 mph ☐ Posted ☒ Statutory

Reasonable & Comfortable
Passenger Car Speed 35 mph

Speed Data N/A

Ball Bank Speed Study Curve north of Bridge #22 had a ball bank indication of 14 at 30 mph.

Warning Signs at Bridge 4 Bridge End Delineators, Weight Limit (21 tons - single vehicle,
27 tons - truck tractor semitrailer)

Roadside Development Wooded in southwest quadrant of bridge. Farm land in all other quadrants
of bridge.

ADT History 2,000 (2010), 2,100 (2009), 2,200 (2007), 2,400 (2005), 2,000 (2003),
2,100 (2001), 2,200 (1999)

Pedestrian/Bicycle Traffic Low

Bridge and Approach
Digital Photos (attached)

Approach Lane Width 10'

Approach Shoulder Width: 6'
Shoulder Type grass

Lane Width (existing bridge) 11'

Shoulder width (existing bridge) 1.7'

Strategic Corridor / Thoroughfare
Designation and Recommended
Cross Section Not a Strategic Corridor/Thoroughfare. Two lane cross section at 35
mph based on 3R guidelines.

Crash History and
Safety Considerations One "Left Turn, Different Roadways" crash reported near bridge (5/1/2003
- 4/30/2013, 10 years).

Comments Curves on both sides of bridge do not affect travel speed across bridge
due to proximity of curves to bridge. Bridge number posted on bridge.
French Mountain Drive located near southern end of bridge.

Reasonable Bridge Speed 35 mph

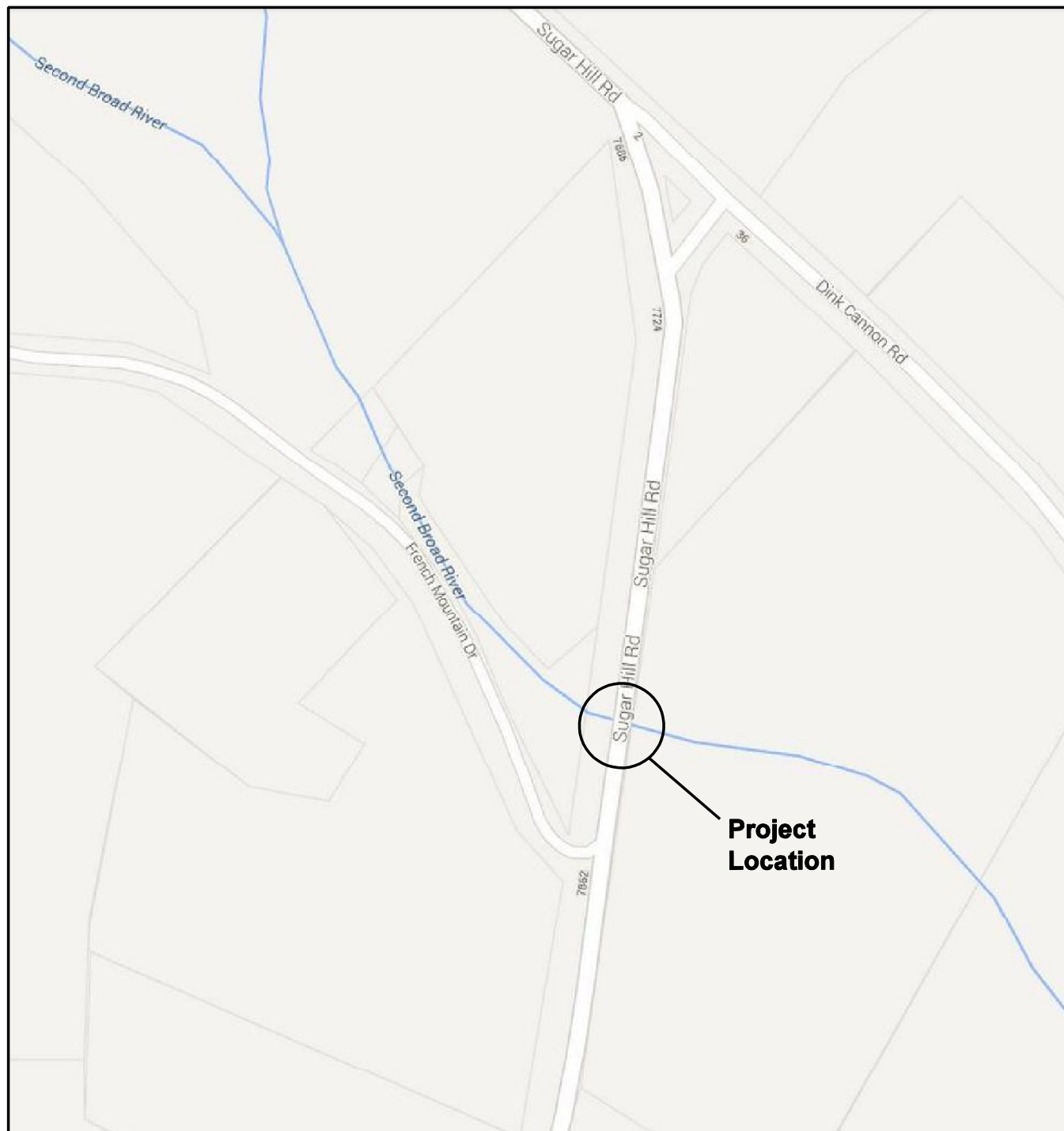
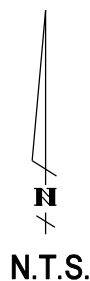
Investigated by: Mathew Bolden

Reviewed by: James Voso

Bridge #22

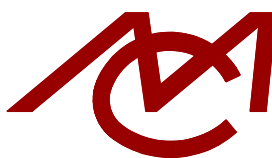
McDowell County

Division 13



VICINITY MAP

Bridge #22 on SR 1001
(Sugar Hill Road)
over Second Broad River



Mattern & Craig

CONSULTING ENGINEERS • SURVEYORS

12 BROAD STREET
ASHEVILLE, NORTH CAROLINA 28801
(828) 254-2201
FAX (828) 254-4562

Comm. No. 3350

Bridge #22
McDowell County
Division 13

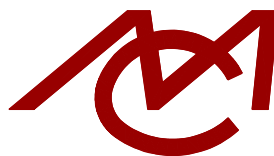


Northbound Approach



Northbound Approach at bridge

Bridge #22 on SR 1001
(Sugar Hill Road)
over Second Broad River



Mattern & Craig
CONSULTING ENGINEERS • SURVEYORS

12 BROAD STREET
ASHEVILLE, NORTH CAROLINA 28801
(828) 254-2201
FAX (828) 254-4562

Comm. No. 3350

Bridge #22
McDowell County
Division 13

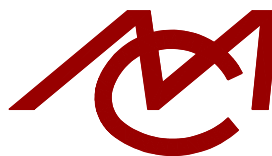


Southbound Approach



Southbound Approach at bridge

Bridge #22 on SR 1001
(Sugar Hill Road)
over Second Broad River



Mattern & Craig
CONSULTING ENGINEERS • SURVEYORS

12 BROAD STREET
ASHEVILLE, NORTH CAROLINA 28801
(828) 254-2201
FAX (828) 254-4562

Comm. No. 3350

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

Study Criteria Summary

County: MCDOWELL **City:** All and Rural
Date: 05/01/2008 to 04/30/2013 **Study:** MCDOWELLBRIDGE22
Location: SR 1001 (Sugar Hill Road) from 500 feet South of Bridge 22 to SR 1163 (Dink Cannon Road)

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	103342031	5.720	12/30/2011 16:12	LEFT TURN, DIFFERENT ROADWAYS	\$ 3500	0	0	0	0	1	1	1	1	0	1	1
Unit	1 : 1	Alchl/Drugs:	0	Speed: 25 MPH	Dir: N	Veh Mnvr/Ped Actn:				8	Obj Strk:					
Unit	2 : 1	Alchl/Drugs:	0	Speed: 50 MPH	Dir: S	Veh Mnvr/Ped Actn:				4	Obj Strk:					

**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/Drugs - Alcohol Drugs Suspected
Veh Mnvr/Ped Actn - Vehicle Maneuver/Pedestrian Action
Obj Strk - Object Struck

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

Summary Statistics

High Level Crash Summary

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

Crash Severity Summary

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

Vehicle Exposure Statistics

Annual ADT = 1700

Total Length = 0.135 (Miles) 0.217 (Kilometers)

Total Vehicle Exposure = 0.42 (MVMT) 0.67 (MVKMT)

Crash Rate	Crashes Per 100 Million Vehicle Miles	Crashes Per 100 Million Vehicle Kilometers
Total Crash Rate	238.63	148.28
Fatal Crash Rate	0.00	0.00
Non Fatal Crash Rate	0.00	0.00
Night Crash Rate	0.00	0.00
Wet Crash Rate	0.00	0.00
EPDO Rate	238.63	148.28

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

Miscellaneous Statistics

Severity Index =	1.00
EPDO Crash Index =	1.00
Estimated Property Damage Total = \$	3500.00

Accident Type Summary

Accident Type	Number of Crashes	Percent of Total
LEFT TURN, DIFFERENT ROADWAYS	1	100.00

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	0	0.00
Total Non-Fatal Injuries	0	0.00
Total Injuries	0	0.00

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

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	0	0.00
Sep	0	0.00
Oct	0	0.00
Nov	0	0.00
Dec	1	100.00

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	100.00
Sat	0	0.00
Sun	0	0.00

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

Hourly Summary

Hour	Number of Crashes	Percent of Total
0000-0059	0	0.00
0100-0159	0	0.00
0200-0259	0	0.00
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	0	0.00
1300-1359	0	0.00
1400-1459	0	0.00
1500-1559	0	0.00
1600-1659	1	100.00
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

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

Light and Road Conditions Summary

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

Vehicle Type Summary

Vehicle Type	Number Involved	Percent of Total
PASSENGER CAR	2	100.00

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

Yearly Totals Summary

Accident Totals

Year	Total Accidents	Fatal Accidents	Injury Accidents	Property Damage Only Accidents
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	1	0	0	1

Injury Totals

Year	Fatal Injuries	Class A, B, or C Injuries
2008	0	0
2009	0	0
2010	0	0
2011	0	0
2012	0	0
2013	0	0
Total	0	0

Miscellaneous Totals

Year	Property Damage	EPDO Index
2008	\$ 0	0.00
2009	\$ 0	0.00
2010	\$ 0	0.00
2011	\$ 3500	1.00
2012	\$ 0	0.00
2013	\$ 0	0.00
Total	\$ 3500	1.00

Type of Accident Totals

Year	Left Turn	Right Turn	Rear End	Run Off Road & Fixed Object	Angle	Side Swipe	Other
2008	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0

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

Year	Run Off Road &						
	Left Turn	Right Turn	Rear End	Fixed Object	Angle	Side Swipe	Other
2010	0	0	0	0	0	0	0
2011	1	0	0	0	0	0	0
2012	0	0	0	0	0	0	0
2013	0	0	0	0	0	0	0
Total	1	0	0	0	0	0	0

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

Strip Diagram

Features	Milepost	Crash IDs
	5.59	
	5.60	
	5.61	
	5.62	
	5.63	
	5.64	
	5.65	
	5.66	
	5.67	
	5.68	
Structure:580022	5.69	
	5.70	
	5.71	
SR 1163	5.72	103342031

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

Study Criteria

Study Name	Log No.	PH No.	TIP No.	K/A Cf.	B/C Cf.	ADT	ADT Route
MCDOWELLBRIDGE22				76.8	8.4	1700	40001001

Request Date	Courier Service	Phone No.	Ext.	Fax No.
--------------	-----------------	-----------	------	---------

County			Municipality					
Name	Code	Div.	Name	Code	Y-Line Ft.	Begin Date	End Date	Years
MCDOWELL	58	13	All and Rural		0	05/01/2008	04/30/2013	5.00

Location Text	Requestor
SR 1001 (Sugar Hill Road) from 500 feet South of Bridge 22 to SR 1163 (Dink Cannon Road)	

Fiche Roads	
Name	Code
SR 1001	40001001
SUGAR HILL	50029517
SUGAR MILL	50029522

Strip Road					
Name	Code	Begin MP	End MP	Miles	Kilometers
SR 1001	40001001	5.585	5.720	0.135	0.217