

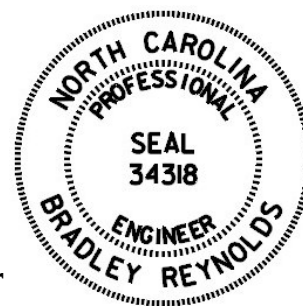
Bridge Approach Speed Investigation

Bridge # 050079 over Elk Creek on SR 1341 (Banner Creek Rd)
Avery County
Project Number 17BP.11.R.127



Document Prepared By:

HNTB North Carolina, P.C.
343 E. Six Forks Rd
Raleigh NC, 27609
NC License No: C-1554



Principal Investigator

DocuSigned by:

Evan Brigham

1/5/2017

A76BD0613FF3476...

Evan Brigham, EI
Traffic Engineer

Project Manager

DocuSigned by:

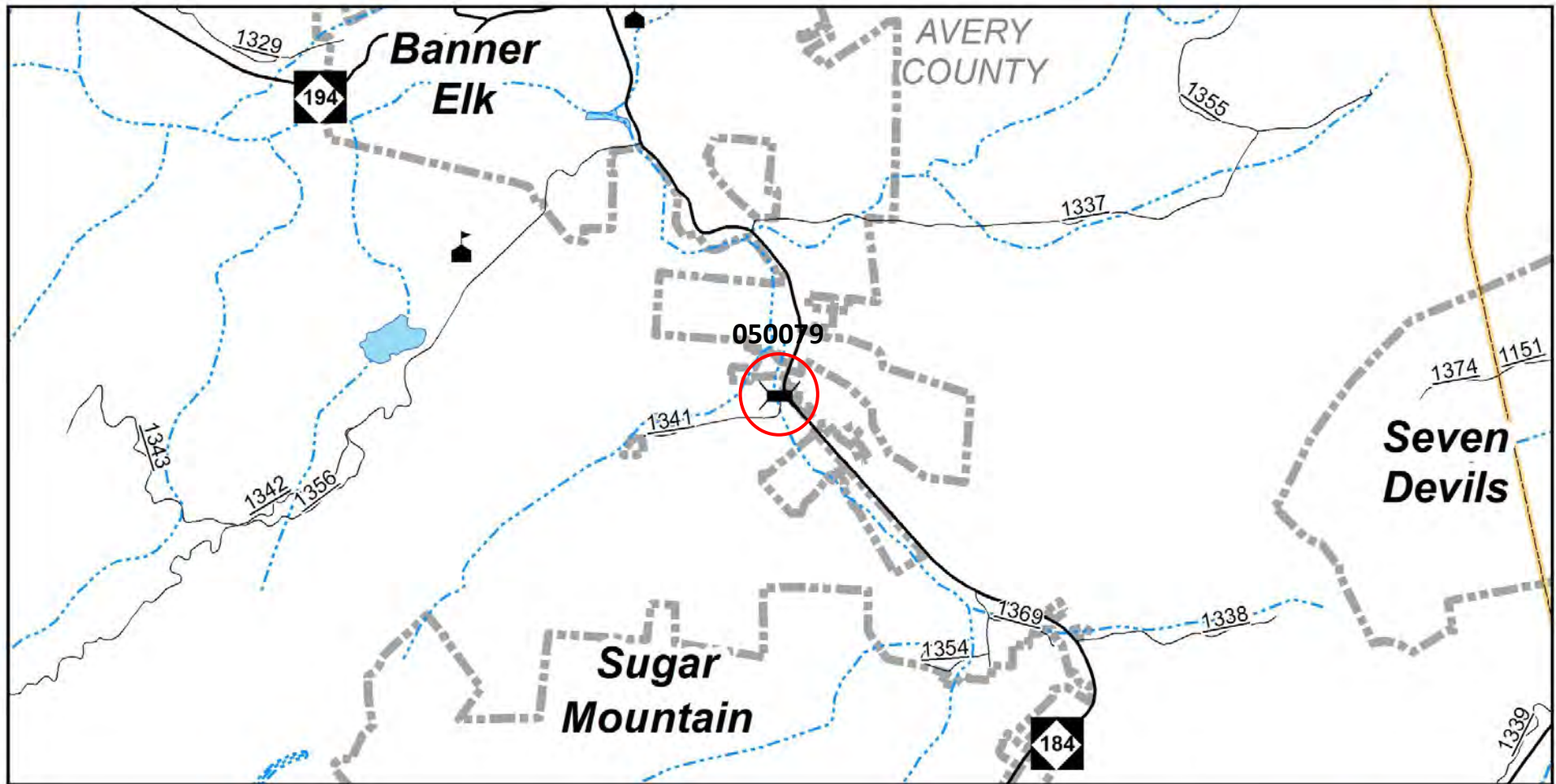
Bradley Reynolds

1/5/2017

61F83373E9F2436...

Bradley Reynolds, PE
Project Manager

Division 11 - Avery County Design Build Year 6/7 Bridge Program



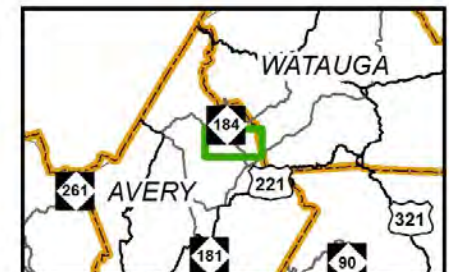
Structure Number	Division	County	Structure Description	Latitude	Longitude
050079	11	Avery	Bridge #050079 over Elk Creek	36.14588	-81.86149

HNTB

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554



1 in = 2,500 ft
SCALE



Bridge and Approach Investigation Checklist

Project 17BP.11.R.127

Description Bridge #050079 over Elk Creek

Route SR 1341 (Banner Creek Rd)

Division 11

County Avery

Existing Speed Limit 55 ☐ Posted ☒ Statutory

Reasonable & Comfortable Passenger Car Speed 25 mph

Speed Data One (1) speed data point was collected: 25 mph.

Ball Bank Speed Study Curve on NB approach ball banks: 12 at 25 mph, and 15 at 30 mph.
Curve on SB approach ball banks: 8 at 25 mph, and 12 at 30 mph.

Warning Signs at Bridge Object Markers (OM-3L & OM-3R) on each bridge approach
Weight Limit Signs - 1 x each approach

Roadside Development Commercial/Retail/Woods

ADT History 370 vpd from Crash Analysis
360 vpd from 2012 AADT Map, Avery County

Pedestrian/Bicycle Traffic Minimal amount expected

Bridge and Approach Digital Photos Attached

Approach Lane Width 20' overall pavement width. No pavement markings.

Approach Shoulder Width: 2'
Shoulder Type Grass

Lane Width (existing bridge) 19' overall pavement width. No pavement markings

Shoulder width (existing bridge) 0'

Strategic Corridor / Thoroughfare Designation and Recommended Cross Section Local, Rural

Crash History and Safety Considerations Two (2) crashes have been reported in the vicinity of the bridge from 11/1/2006 to 10/31/2016 (10 years).
Both incidents occurred at NC 184 and SR 1341.

Comments If the bridge and approaches are widened, the approach speeds may be greater than the observed speeds.
NB approach experiences sharp curves and poor sight distance, leading to slower speeds.
Significant signs of rust on bridge supports - steel starting to flake off. Bridge deck cracking.
Narrow Bridge sign on SB approach.
Consider realigning SR 1341 and moving bridge 250' south to eliminate curve and to line up with Elk Hill Rd for a shorter crossing.

Reasonable Bridge Speed 35 mph

Investigated by: Evan Brigham, EI 12/13/2016 Reviewed by: Bradley Reynolds, PE

SR 1341 (Banner Creek Rd) Northbound $\pm$ 250' from Bridge #79



SR 1341 (Banner Creek Rd) Northbound $\pm$ 50' from Bridge #79



SR 1341 (Banner Creek Rd) Southbound $\pm$ 250' from Bridge #79



SR 1341 (Banner Creek Rd) Southbound $\pm$ 50' from Bridge #79



View of Bridge #79 Looking Northeast



View of Bridge #79 Looking Northwest



Narrow Bridge Sign on Southbound Approach



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

Study Criteria Summary

County: AVERY **City:** All and Rural
Date: 11/1/2006 **to** 10/31/2016 **Study:** AVERYBRIDGE79
Location: SR 1341 (Banner Creek Rd) from NC 184 (Tynecastle Hwy) to 500 feet west of Bridge 79

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	102235532	0.000	01/07/2008 01:00	RAN OFF ROAD - RIGHT	\$ 8000	0	0	0	0	1	5	1	7	0	0	
Unit	1 : 1	Alchl/Drugs:	1	Speed: 50 MPH	Dir: S	Veh Mnvr/Ped Actn:				4	Obj Strk:			18		
2	103632737	0.003	12/05/2012 12:14	REAR END, SLOW OR STOP	\$ 4500	0	0	0	0	2	1	2	5	0		2
Unit	1 : 1	Alchl/Drugs:	0	Speed: 5 MPH	Dir: N	Veh Mnvr/Ped Actn:				4	Obj Strk:					
Unit	2 : 4	Alchl/Drugs:	0	Speed: 0 MPH	Dir: N	Veh Mnvr/Ped Actn:				1	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	2	100.00
Fatal Crashes	0	0.00
Non-Fatal Injury Crashes	0	0.00
Total Injury Crashes	0	0.00
Property Damage Only Crashes	2	100.00
Night Crashes	1	50.00
Wet Crashes	1	50.00
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	0	0.00
Property Damage Only Crashes	2	100.00

Vehicle Exposure Statistics

Annual ADT = 370

Total Length = 0.123 (Miles) 0.198 (Kilometers)

Total Vehicle Exposure = 0.17 (MVMT) 0.27 (MVKMT)

Crash Rate	Crashes Per 100 Million Vehicle Miles	Crashes Per 100 Million Vehicle Kilometers
Total Crash Rate	1203.02	747.52
Fatal Crash Rate	0.00	0.00
Non Fatal Crash Rate	0.00	0.00
Night Crash Rate	601.51	373.76
Wet Crash Rate	601.51	373.76
EPDO Rate	1203.02	747.52

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

Miscellaneous Statistics

Severity Index =	1.00
EPDO Crash Index =	2.00
Estimated Property Damage Total = \$	12500.00

Accident Type Summary

Accident Type	Number of Crashes	Percent of Total
RAN OFF ROAD - RIGHT	1	50.00
REAR END, SLOW OR STOP	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	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	1	50.00
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	50.00

Daily Summary

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

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

Light and Road Conditions Summary

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

Object Struck Summary

Object Type	Times Struck	Percent of Total
MOVABLE OBJECT	1	100.00

Vehicle Type Summary

Vehicle Type	Number Involved	Percent of Total
PASSENGER CAR	2	66.67
SPORT UTILITY	1	33.33

**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
2006	0	0	0	0
2007	0	0	0	0
2008	1	0	0	1
2009	0	0	0	0
2010	0	0	0	0
2011	0	0	0	0
2012	1	0	0	1
2013	0	0	0	0
2014	0	0	0	0
2015	0	0	0	0
2016	0	0	0	0
Total	2	0	0	2

Injury Totals

Year	Fatal Injuries	Class A, B, or C Injuries
2006	0	0
2007	0	0
2008	0	0
2009	0	0
2010	0	0
2011	0	0
2012	0	0
2013	0	0
2014	0	0
2015	0	0
2016	0	0
Total	0	0

Miscellaneous Totals

Year	Property Damage	EPDO Index
2006	\$ 0	0.00
2007	\$ 0	0.00

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

Year	Property Damage	EPDO Index
2008	\$ 8000	1.00
2009	\$ 0	0.00
2010	\$ 0	0.00
2011	\$ 0	0.00
2012	\$ 4500	1.00
2013	\$ 0	0.00
2014	\$ 0	0.00
2015	\$ 0	0.00
2016	\$ 0	0.00
Total	\$ 12500	2.00

Type of Accident Totals

Year	Left Turn	Right Turn	Rear End	Run Off Road & Fixed Object	Angle	Side Swipe	Other
2006	0	0	0	0	0	0	0
2007	0	0	0	0	0	0	0
2008	0	0	0	1	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	0
2012	0	0	1	0	0	0	0
2013	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0
Total	0	0	1	1	0	0	0

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

Strip Diagram

Features	Milepost	Crash IDs
NC 184 NC 194 Structure:050079	0.00	102235532 103632737
	0.01	
	0.02	
	0.03	
	0.04	
	0.05	
	0.06	
	0.07	
	0.08	
	0.09	
	0.10	
	0.11	
	0.12	

**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
AVERYBRIDGE79				76.8	8.4	370	40001341

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

County			Municipality					
Name	Code	Div.	Name	Code	Y-Line Ft.	Begin Date	End Date	Years
AVERY	6	11	All and Rural		0	11/1/2006	10/31/2016	10.00

Location Text	Requestor
SR 1341 (Banner Creek Rd) from NC 184 (Tynecastle Hwy) to 500 feet west of Bridge 79	

Included Accidents	Old MP	New MP	Type
103632737		0.003	I

Excluded Accidents
102262595

Fiche Roads

Name	Code
SR 1341	40001341
BANNER CREEK	50035068

Strip Road

Name	Code	Begin MP	End MP	Miles	Kilometers
SR 1341	40001341	0.000	0.123	0.123	0.198