

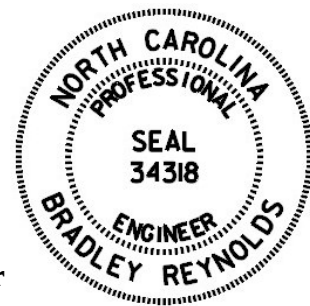
Bridge Approach Speed Investigation

Bridge # 050001 over Linville River on SR 1349 (Ruffin St)
Avery County
Project Number 17BP.11.R.134



Document Prepared By:

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Principal Investigator

DocuSigned by:
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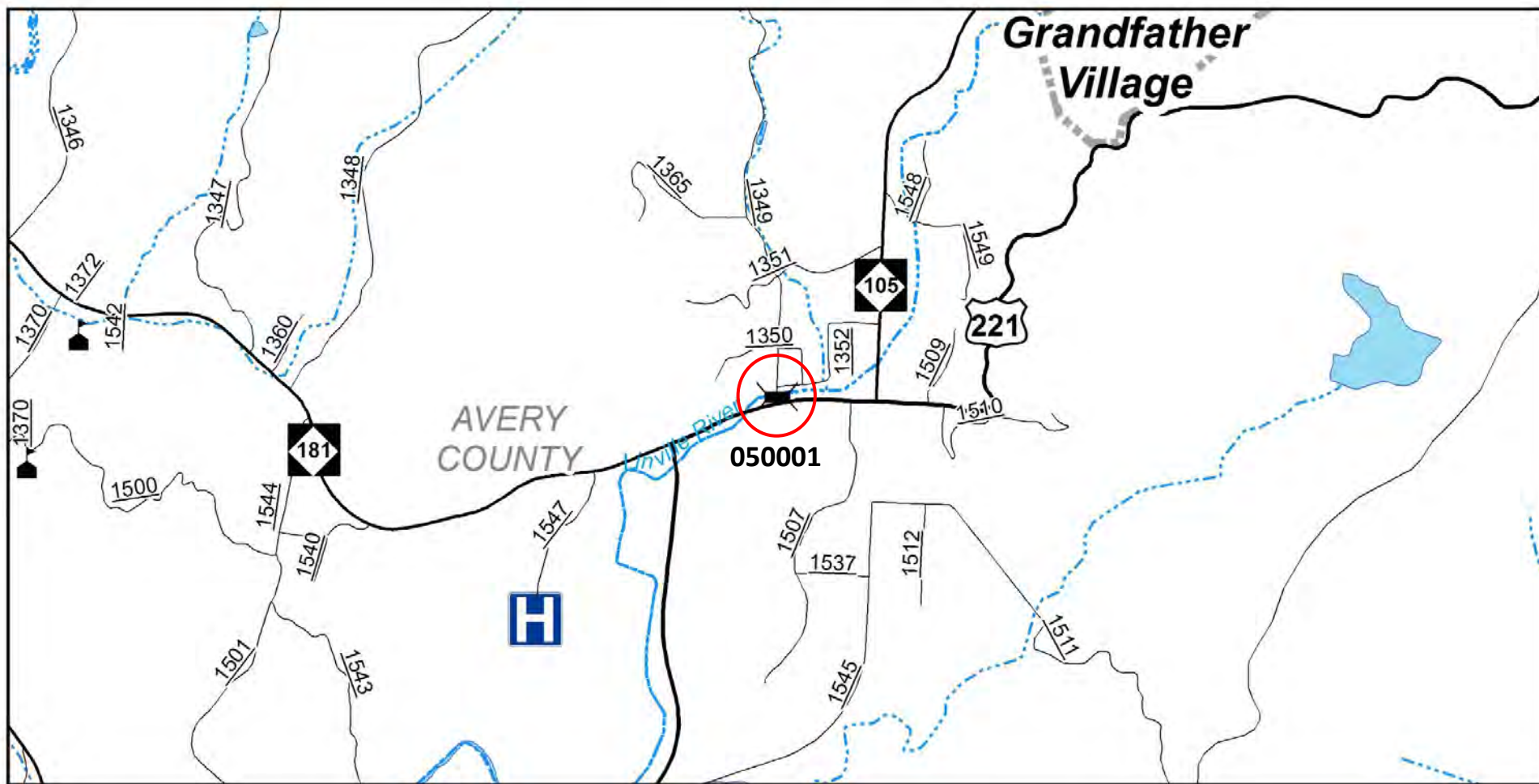
Evan Brigham, EI
Traffic Engineer

Project Manager

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Bradley Reynolds 1/5/2017
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Bradley Reynolds, PE
Project Manager

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



Structure Number	Division	County	Structure Description	Latitude	Longitude
050001	11	Avery	Bridge #050001 over Linville River	36.07119	-81.87574



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1 in = 2,500 ft
SCALE



Bridge and Approach Investigation Checklist

Project	17BP.11.R.134
Description	Bridge #050001 over Linville River
Route	SR 1349 (Ruffin St)
Division	11
County	Avery

Existing Speed Limit	25	☒ Posted	☐ Statutory
Reasonable & Comfortable Passenger Car Speed	25 mph		
Speed Data	Three (3) speed data points were collected: 15 mph, 14 mph, and 18 mph.		
Ball Bank Speed Study	No study performed; bridge in tangent section.		
Warning Signs at Bridge	Object Markers (OM-3L & OM-3R) on each bridge approach Weight signs not present on either approach.		
Roadside Development	Residential/Woods. Some retail in NW quadrant.		
ADT History	410 vpd from Crash Analysis 430 vpd from 2015 AADT Map, Avery County		
Pedestrian/Bicycle Traffic	Minimal amount expected		
Bridge and Approach Digital Photos	Attached		
Approach Lane Width	16' overall pavement width with two 8' lanes.		
Approach Shoulder Width:	2'		
Shoulder Type	Grass		
Lane Width (existing bridge)	16' overall pavement width with one 12' lane.		
Shoulder width (existing bridge)	2'		
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). One occurred in front of Old Hampton store. Neither incidents involved the actual bridge.		
Comments	One lane bridge. If the bridge and approaches are widened, the approach speeds may be greater than the observed speeds. Signs on each approach include 25 mph speed limit and One Lane Bridge signs. Stop-controlled intersection with US 221 located approximately 50' south of bridge and with Third Street approximately 100' north of bridge. Steel supports below bridge very rusted. Concrete uprights also show wear. Pavement cracked across bridge. Powerlines cross bridge on NB approach.		

Reasonable Bridge Speed 25 mph

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

US 221 Eastbound $\pm$ 150' from Bridge #1



SR 1349 (Ruffin St) Northbound $\pm$ 50' from Bridge #1



SR 1349 (Ruffin St) Southbound $\pm$ 250' from Bridge #1



SR 1349 (Ruffin St) Southbound $\pm$ 50' from Bridge #1



View of Bridge #1 Looking Southwest



Steel shows rust, concrete shows wear



View of Bridge #1 Looking Southeast



One Lane Bridge sign SB



**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:** AVERYBRIDGE1
Location: SR 1349 (Ruffin St) from US 221 (Mitchell Ave) to 500 feet north of Bridge 1

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	103207939	0.070	07/22/2011 16:11	BACKING UP	\$ 1500	0	0	0	0	1	1	2	1	0	0	
Unit	1 : 1	Alchl/Drgs:	0	Speed:	10 MPH	Dir:	E	Veh Mnvr/Ped Actn:			10	Obj Strk:				
Unit	2 : 1	Alchl/Drgs:	7	Speed:	0 MPH	Dir:	N	Veh Mnvr/Ped Actn:			2	Obj Strk:				

2	104461038	0.090	08/12/2015 15:10	PARKED MOTOR VEHICLE	\$ 3500	0	0	0	0	1	1	1	1	0	13	1
Unit	1 : 5	Alchl/Drgs:	1	Speed:	25 MPH	Dir:	S	Veh Mnvr/Ped Actn:			4	Obj Strk: 20				
Unit	2 : 1	Alchl/Drgs:	7	Speed:	0 MPH	Dir:	W	Veh Mnvr/Ped Actn:			2	Obj Strk: 20				

**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

**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	0	0.00
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	0	0.00
Property Damage Only Crashes	2	100.00

Vehicle Exposure Statistics

Annual ADT = 410

Total Length = 0.121 (Miles) 0.195 (Kilometers)

Total Vehicle Exposure = 0.18 (MVMT) 0.29 (MVKMT)

Crash Rate	Crashes Per 100 Million Vehicle Miles	Crashes Per 100 Million Vehicle Kilometers
Total Crash Rate	1103.60	685.74
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	1103.60	685.74

**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 = \$	5000.00

Accident Type Summary

Accident Type	Number of Crashes	Percent of Total
BACKING UP	1	50.00
PARKED MOTOR VEHICLE	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	0	0.00
Feb	0	0.00
Mar	0	0.00
Apr	0	0.00
May	0	0.00
Jun	0	0.00
Jul	1	50.00
Aug	1	50.00
Sep	0	0.00
Oct	0	0.00
Nov	0	0.00
Dec	0	0.00

Daily Summary

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

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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	1	50.00
1600-1659	1	50.00
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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Traffic Engineering Accident Analysis System
Strip Analysis Report**

Light and Road Conditions Summary

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

Object Struck Summary

Object Type	Times Struck	Percent of Total
PARKED MOTOR VEHICLE	2	100.00

Vehicle Type Summary

Vehicle Type	Number Involved	Percent of Total
PASSENGER CAR	3	75.00
VAN	1	25.00

**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
2006	0	0	0	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
2014	0	0	0	0
2015	1	0	0	1
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	\$ 0	0.00
2009	\$ 0	0.00
2010	\$ 0	0.00
2011	\$ 1500	1.00
2012	\$ 0	0.00
2013	\$ 0	0.00
2014	\$ 0	0.00
2015	\$ 3500	1.00
2016	\$ 0	0.00
Total	\$ 5000	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	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
2014	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	1
2016	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	2

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

Strip Diagram

Features	Milepost	Crash IDs
US 221	0.00	
	0.01	
Structure:050001	0.02	
	0.03	
	0.04	
SR 1352	0.05	
	0.06	
	0.07	103207939
	0.08	
	0.09	104461038
	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
AVERYBRIDGE1				76.8	8.4	410	40001349

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
AVERY	6	11	All and Rural		0	11/1/2006	10/31/2016	10.00

Location Text	Requestor
SR 1349 (Ruffin St) from US 221 (Mitchell Ave) to 500 feet north of Bridge 1	

Included Accidents	Old MP	New MP	Type
104461038		0.09	I

Fiche Roads	
Name	Code
SR 1349	40001349
RUFFIN	50026680
FORK	50010868

Strip Road					
Name	Code	Begin MP	End MP	Miles	Kilometers
SR 1349	40001349	0.000	0.121	0.121	0.195