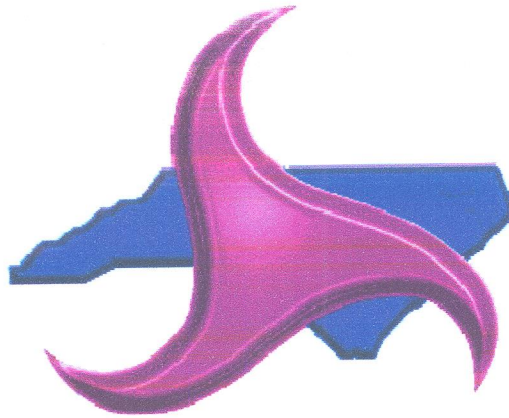


Bridge Design Speed Investigation

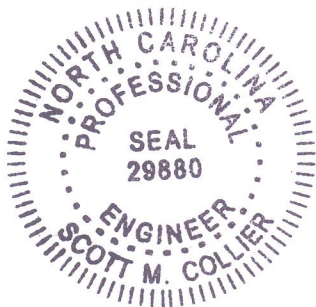
B-5555 – Bridge #46 on NC 215 over the North Fork of French Broad River.
Transylvania County



Document Prepared By:

Regional Traffic Office – Blue Ridge Mountains Region
Traffic Safety Unit
Transportation Safety and Mobility
North Carolina Department of Transportation

December 3, 2014



Investigating Engineer

A handwritten signature of Scott M. Collier, written in black ink. The signature is stylized and appears to be "Scott M. Collier". It is written over a horizontal line.

Scott M. Collier, PE
Regional Traffic Support Engineer

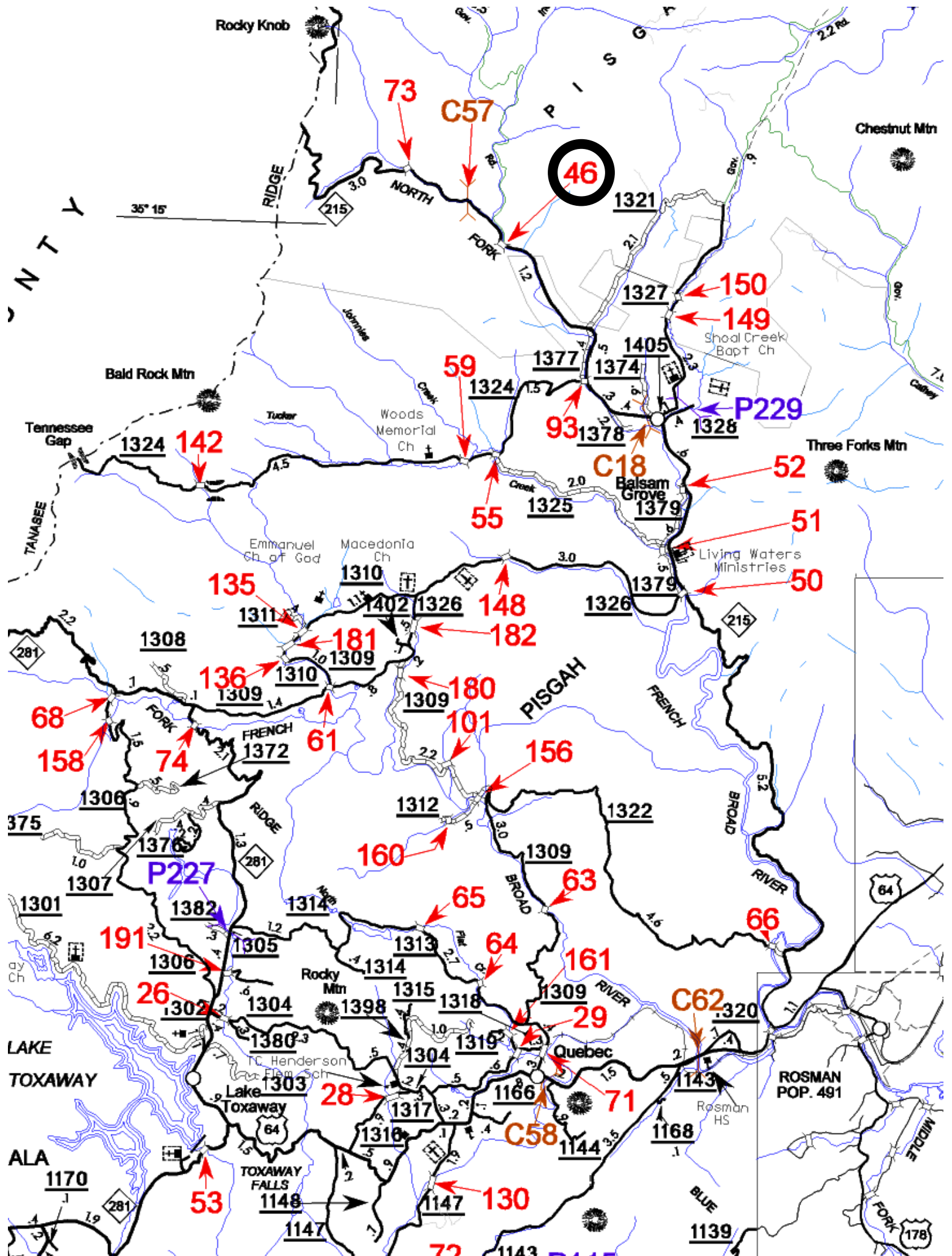
Bridge and Approach Investigation Checklist

Project	B-5555
Description	Replace Bridge #46 on NC 215 over North Fork of French Broad River
Route	NC 215
Division	14
County	Transylvania

Existing Speed Limit	55-mph	☐ Posted	☒ Statutory
Reasonable & Comfortable Passenger Car Speed	25-mph		
Speed Data	None taken due to low volume.		
Ball Bank Speed Study	Ball Bank = 15 at 20-mph (on southbound NC 215 for curve just north of bridge). Curves near bridge would have advisory speeds at or under 35-mph.		
Warning Signs at Bridge	Narrow bridge (symbol), turn warning signs with 20-mph advisory speed plates, 4 Bridge End Delineators, Weight Limit (38 tons - single vehicle, 40 tons - truck tractor semitrailer).		
Roadside Development	Undeveloped (Pisgah National Forest)		
ADT History	100 (2013), 195 (2011), 110 (2008), 245 (2006), 310 (2004), 260 (2002)		
Pedestrian/Bicycle Traffic	Low to medium.		
Bridge and Approach Digital Photos	(attached)		
Approach Lane Width	10.0'		
Approach Shoulder Width:	0.75'	4.5'	
Shoulder Type	paved	grass	
Lane Width (existing bridge)	9.0'		
Shoulder width (existing bridge)	0.5' (paved)		
Strategic Corridor / Thoroughfare Designation and Recommended Cross Section	Not a Strategic Corridor/Thoroughfare. Two-lane cross section.		
Crash History and Safety Considerations	Four total crashes (two on or at bridge, two near bridge).		
Comments	Curve north of bridge controls speed across the bridge.		

Reasonable Bridge Speed 25-mph

Investigated by:	Scott M. Collier, P.E.	Reviewed by:	
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**North Carolina Department of Transportation
Traffic Engineering Accident Analysis System
Strip Analysis Report**

Study Criteria Summary

County: TRANSYLVANIA **City:** All and Rural
Date: 11/1/2004 **to** 10/31/2014 **Study:** 41000032534
Location: 500 feet on Both Sides of Bridge Number 46 on NC 215 over N Fork of Broad River

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	102372188	10.412	07/20/2008 13:00	FIXED OBJECT	\$ 4000	0	0	1	0	1	1	1	5	0	13	1
Unit 1 : 20		Alchl/Drgs:	0	Speed:	35 MPH	Dir:	N	Veh Mnvr/Ped Actn:				4	Obj Strk:		64	
2	102372193	10.412	07/20/2008 13:00	FIXED OBJECT	\$ 1000	0	0	1	0	1	1	1	5	0	13	1
Unit 1 : 20		Alchl/Drgs:	0	Speed:	35 MPH	Dir:	N	Veh Mnvr/Ped Actn:				4	Obj Strk:		42	
3	103581437	10.426	10/24/2012 13:20	FIXED OBJECT	\$ 2500	0	0	1	0	1	1	1	7	0	13	1
Unit 1 : 20		Alchl/Drgs:	0	Speed:	35 MPH	Dir:	S	Veh Mnvr/Ped Actn:				4	Obj Strk:		42	
4	103865991	10.436	10/04/2013 00:00	FIXED OBJECT	\$ 4000	0	0	0	0	1	5	1	7	0	13	1
Unit 1 : 4		Alchl/Drgs:	0	Speed:	50 MPH	Dir:	N	Veh Mnvr/Ped Actn:				4	Obj Strk:		59	

**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	4	100.00
Fatal Crashes	0	0.00
Non-Fatal Injury Crashes	3	75.00
Total Injury Crashes	3	75.00
Property Damage Only Crashes	1	25.00
Night Crashes	1	25.00
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	4	100.00
Fatal Crashes	0	0.00
Class A Crashes	0	0.00
Class B Crashes	3	75.00
Class C Crashes	0	0.00
Property Damage Only Crashes	1	25.00

Vehicle Exposure Statistics

Annual ADT = 270

Total Length = 0.2 (Miles)

0.322 (Kilometers)

Total Vehicle Exposure = 0.2 (MVMT)

0.32 (MVKMT)

Crash Rate	Crashes Per 100 Million Vehicle Miles	Crashes Per 100 Million Vehicle Kilometers
Total Crash Rate	2028.32	1260.34
Fatal Crash Rate	0.00	0.00
Non Fatal Crash Rate	1521.24	945.25
Night Crash Rate	507.08	315.08
Wet Crash Rate	0.00	0.00
EPDO Rate	13285.48	8255.21

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

Miscellaneous Statistics

Severity Index =	6.55
EPDO Crash Index =	26.20
Estimated Property Damage Total = \$	11500.00

Accident Type Summary

Accident Type	Number of Crashes	Percent of Total
FIXED OBJECT	4	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	3	100.00
Class C Injuries	0	0.00
Total Non-Fatal Injuries	3	100.00
Total Injuries	3	100.00

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	2	50.00
Aug	0	0.00
Sep	0	0.00
Oct	2	50.00
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	25.00
Thu	0	0.00
Fri	1	25.00
Sat	0	0.00
Sun	2	50.00

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

Hourly Summary

Hour	Number of Crashes	Percent of Total
0000-0059	1	25.00
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	3	75.00
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	3	0	0	3
Dark	1	0	0	1
Other	0	0	0	0
Total	4	0	0	4

Object Struck Summary

Object Type	Times Struck	Percent of Total
EMBANKMENT	1	25.00
GUARDRAIL FACE ON SHOULDER	2	50.00
OTHER FIXED OBJECT	1	25.00

Vehicle Type Summary

Vehicle Type	Number Involved	Percent of Total
MOTORCYCLE	3	75.00
SPORT UTILITY	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
2004	0	0	0	0
2005	0	0	0	0
2006	0	0	0	0
2007	0	0	0	0
2008	2	0	2	0
2009	0	0	0	0
2010	0	0	0	0
2011	0	0	0	0
2012	1	0	1	0
2013	1	0	0	1
2014	0	0	0	0
Total	4	0	3	1

Injury Totals

Year	Fatal Injuries	Class A, B, or C Injuries
2004	0	0
2005	0	0
2006	0	0
2007	0	0
2008	0	2
2009	0	0
2010	0	0
2011	0	0
2012	0	1
2013	0	0
2014	0	0
Total	0	3

Miscellaneous Totals

Year	Property Damage	EPDO Index
2004	\$ 0	0.00
2005	\$ 0	0.00
2006	\$ 0	0.00

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

Year	Property Damage	EPDO Index
2007	\$ 0	0.00
2008	\$ 5000	16.80
2009	\$ 0	0.00
2010	\$ 0	0.00
2011	\$ 0	0.00
2012	\$ 2500	8.40
2013	\$ 4000	1.00
2014	\$ 0	0.00
Total	\$ 11500	26.20

Type of Accident Totals

Year	Left Turn	Right Turn	Rear End	Run Off Road & Fixed Object	Angle	Side Swipe	Other
2004	0	0	0	0	0	0	0
2005	0	0	0	0	0	0	0
2006	0	0	0	0	0	0	0
2007	0	0	0	0	0	0	0
2008	0	0	0	2	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	0	1	0	0	0
2013	0	0	0	1	0	0	0
2014	0	0	0	0	0	0	0
Total	0	0	0	4	0	0	0

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

Strip Diagram

Features	Milepost	Crash IDs
Structure:870046	10.31	
	10.32	
	10.33	
	10.34	
	10.35	
	10.36	
	10.37	
	10.38	
	10.39	
	10.40	
	10.41	102372188 102372193
	10.42	
	10.43	103581437
	10.44	103865991
	10.45	
	10.46	
	10.47	
	10.48	
	10.49	
	10.50	
	10.51	

**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
41000032534	41000032534			76.8	8.4	270	30000215

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
TRANSYLVANIA	87	14	All and Rural		0	11/1/2004	10/31/2014	10.00

Location Text	Requestor
500 feet on Both Sides of Bridge Number 46 on NC 215 over N Fork of Broad River	D.D Galloway, PE NCDOT Blue Ridge Mountains Region

Included Accidents	Old MP	New MP	Type
103581437	10.312	10.426	R
103865991	10.412	10.436	R
102372193	10.712	10.412	I
102372188	10.712	10.412	I

Excluded Accidents
104192737

Fiche Roads

Name	Code
NC 215	30000215
PARKWAY	50023468

Strip Road

Name	Code	Begin MP	End MP	Miles	Kilometers
NC 215	30000215	10.312	10.512	0.200	0.322

B-5555, Bridge #46 on NC 215, Transylvania County



NC 215, northbound approach.



NC 215, northbound approach at bridge.

B-5555, Bridge #46 on NC 215, Transylvania County



NC 215, southbound approach.



NC 215, southbound approach at bridge.