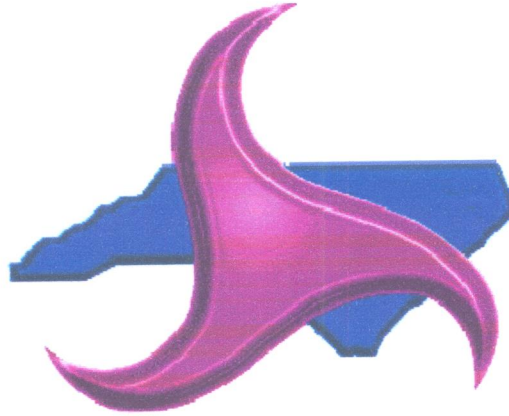


Bridge Design Speed Investigation

B-5554 – Bridge #73 on NC 215 over Beetree Fork.
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 in black ink, which appears to read "Scott M. Collier". The signature is fluid and cursive, written over a horizontal line.

Scott M. Collier, PE
Regional Traffic Support Engineer

Bridge and Approach Investigation Checklist

Project B-5554
Description Replace Bridge #73 on NC 215 over Beetree Fork.
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 = 16-17 at 25-mph (for curve just south of bridge). Curves near bridge would have advisory speeds at or under 35-mph.

Warning Signs at Bridge Reverse turn with 20-mph advisory speed plates, narrow bridge (symbol), four bridge end delineators.

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. There is hiking/biking trailhead on the northeast shoulder near the bridge.

Bridge and Approach
Digital Photos (attached)

Approach Lane Width 10.5'

Approach Shoulder Width: 0.5' 4.0'
Shoulder Type paved grass

Lane Width (existing bridge) 9.0'

Shoulder width (existing bridge) 0.5' (paved)

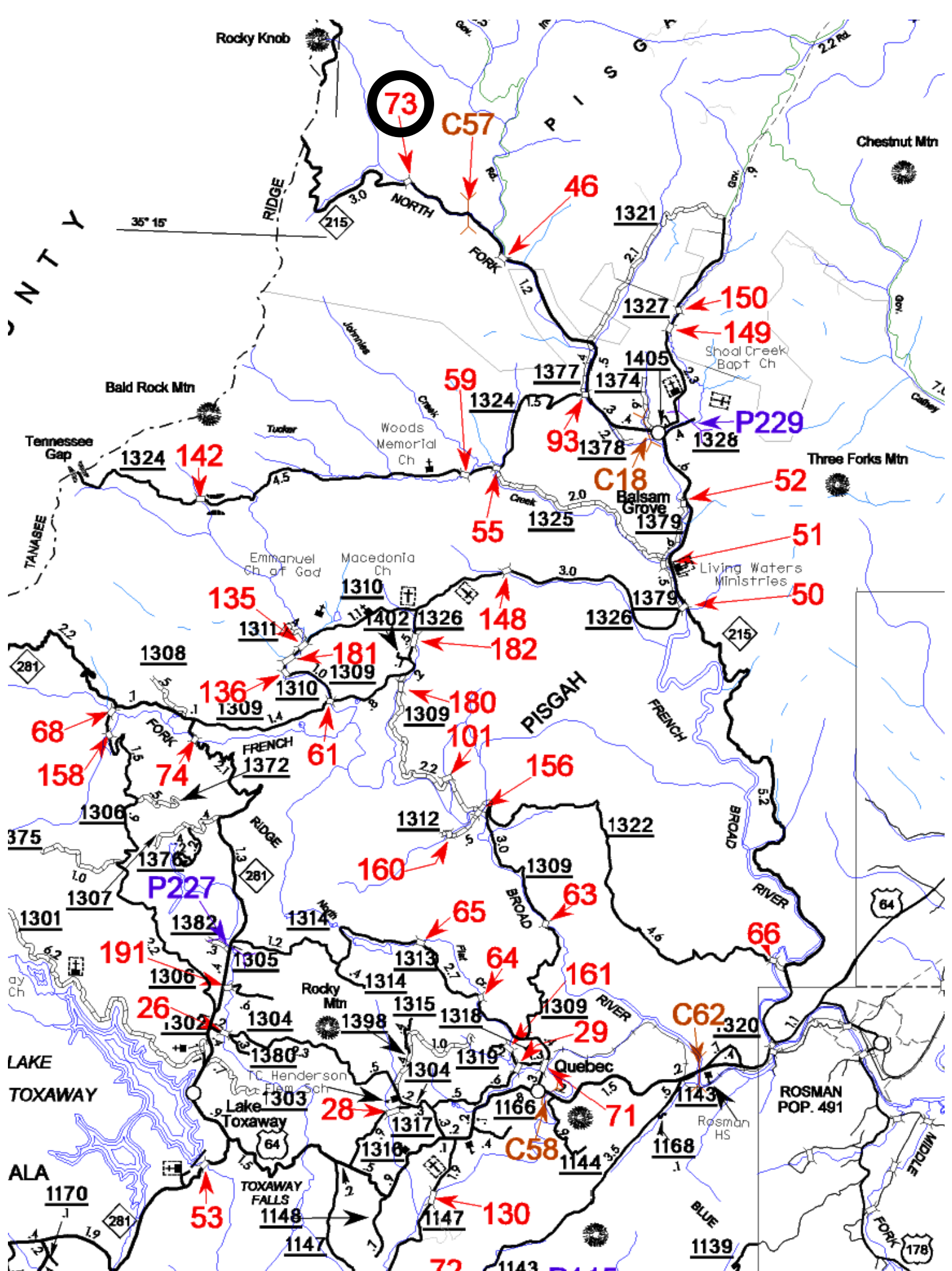
Strategic Corridor / Thoroughfare
Designation and Recommended
Cross Section Not a Strategic Corridor/Thoroughfare. Two-lane cross section.

Crash History and
Safety Considerations Three total crashes (all three on or at bridge).

Comments Reverse curve, especiall the curve south of the bridge, controls speed across bridge.

Reasonable Bridge Speed 25-mph

Investigated by: Scott M. Collier, P.E. Reviewed by: _____



**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:** 41000032535
Location: 500 feet on Both Sides of Bridge Number 73 on NC 215 over Beetree Fork

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	103170604	11.712	06/05/2011 14:00	FIXED OBJECT	\$ 2000	0	0	1	0	1	1	1	5	0	13	1
Unit 1 : 20		Alchl/Drugs:	0	Speed: 50 MPH	Dir: N	Veh Mnvr/Ped Actn:				4	Obj Strk:			50		
2	103269728	11.712	10/08/2011 14:48	FIXED OBJECT	\$ 4000	0	0	0	0	1	1	1	5	0	13	1
Unit 1 : 20		Alchl/Drugs:	0	Speed: 35 MPH	Dir: N	Veh Mnvr/Ped Actn:				4	Obj Strk:			50		
3	103956112	11.712	01/19/2014 10:45	FIXED OBJECT	\$ 6500	0	0	0	0	1	1	1	5	0	13	1
Unit 1 : 1		Alchl/Drugs:	0	Speed: 45 MPH	Dir: N	Veh Mnvr/Ped Actn:				4	Obj Strk:			50		

**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	3	100.00
Fatal Crashes	0	0.00
Non-Fatal Injury Crashes	1	33.33
Total Injury Crashes	1	33.33
Property Damage Only Crashes	2	66.67
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	3	100.00
Fatal Crashes	0	0.00
Class A Crashes	0	0.00
Class B Crashes	1	33.33
Class C Crashes	0	0.00
Property Damage Only Crashes	2	66.67

Vehicle Exposure Statistics

Annual ADT = 150

Total Length = 0.196 (Miles) 0.315 (Kilometers)

Total Vehicle Exposure = 0.11 (MVMT) 0.17 (MVKMT)

Crash Rate	Crashes Per 100 Million Vehicle Miles	Crashes Per 100 Million Vehicle Kilometers
Total Crash Rate	2794.11	1736.18
Fatal Crash Rate	0.00	0.00
Non Fatal Crash Rate	931.37	578.73
Night Crash Rate	0.00	0.00
Wet Crash Rate	0.00	0.00
EPDO Rate	9686.24	6018.75

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

Miscellaneous Statistics

Severity Index =	3.47
EPDO Crash Index =	10.40
Estimated Property Damage Total = \$	12500.00

Accident Type Summary

Accident Type	Number of Crashes	Percent of Total
FIXED OBJECT	3	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	1	100.00
Class C Injuries	0	0.00
Total Non-Fatal Injuries	1	100.00
Total Injuries	1	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	1	33.33
Feb	0	0.00
Mar	0	0.00
Apr	0	0.00
May	0	0.00
Jun	1	33.33
Jul	0	0.00
Aug	0	0.00
Sep	0	0.00
Oct	1	33.33
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	0	0.00
Thu	0	0.00
Fri	0	0.00
Sat	1	33.33
Sun	2	66.67

North Carolina Department of Transportation
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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	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	1	33.33
1100-1159	0	0.00
1200-1259	0	0.00
1300-1359	0	0.00
1400-1459	2	66.67
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
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Light and Road Conditions Summary

Condition	Dry	Wet	Other	Total
Day	3	0	0	3
Dark	0	0	0	0
Other	0	0	0	0
Total	3	0	0	3

Object Struck Summary

Object Type	Times Struck	Percent of Total
BRIDGE RAIL FACE	3	100.00

Vehicle Type Summary

Vehicle Type	Number Involved	Percent of Total
MOTORCYCLE	2	66.67
PASSENGER CAR	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
2004	0	0	0	0
2005	0	0	0	0
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	2	0	1	1
2012	0	0	0	0
2013	0	0	0	0
2014	1	0	0	1
Total	3	0	1	2

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	0
2009	0	0
2010	0	0
2011	0	1
2012	0	0
2013	0	0
2014	0	0
Total	0	1

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	\$ 0	0.00
2009	\$ 0	0.00
2010	\$ 0	0.00
2011	\$ 6000	9.40
2012	\$ 0	0.00
2013	\$ 0	0.00
2014	\$ 6500	1.00
Total	\$ 12500	10.40

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	0	0	0	0
2009	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0
2011	0	0	0	2	0	0	0
2012	0	0	0	0	0	0	0
2013	0	0	0	0	0	0	0
2014	0	0	0	1	0	0	0
Total	0	0	0	3	0	0	0

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Strip Analysis Report

Strip Diagram

Features	Milepost	Crash IDs
Structure:870073	11.61	
	11.62	
	11.63	
	11.64	
	11.65	
	11.66	
	11.67	
	11.68	
	11.69	
	11.70	
	11.71	103170604 103269728 103956112
	11.72	
	11.73	
	11.74	
	11.75	
	11.76	
	11.77	
	11.78	
	11.79	
	11.80	
	11.81	

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
41000032535	41000032535			76.8	8.4	150	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 73 on NC 215 over Beetree Fork	D.D Galloway, PE NCDOT Blue Ridge Mountains Region

Included Accidents	Old MP	New MP	Type
103269728	11.512	11.712	I
103170604	11.512	11.712	I
103956112	11.612	11.712	I

Fiche Roads

Name	Code
NC 215	30000215
PARKWAY	50023468

Strip Road

Name	Code	Begin MP	End MP	Miles	Kilometers
NC 215	30000215	11.614	11.810	0.196	0.315

B-5554, Bridge #73 on NC 215, Transylvania County



NC 215, northbound approach.



NC 215, northbound approach at bridge.

B-5554, Bridge #73 on NC 215, Transylvania County



NC 215, southbound approach.



NC 215, southbound approach at bridge.