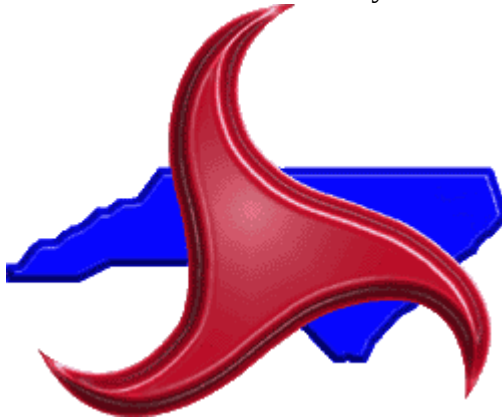

Bridge Design Speed Investigation

250045

Structure #45 on SR 2030 (Hollow Bridge Rd) over South River

Cumberland County



Document Prepared By:

Ramey Kemp & Associates, Inc.
8307 University Execution Park Drive, Suite 260
Charlotte, NC 28262

April 13, 2016

Project Manager

A handwritten signature in black ink, reading "Jacob D. Carpenter".

Jacob D. Carpenter, PE
Regional Manager

Principal Investigator

A handwritten signature in black ink, reading "J. Andrew Eagle".

J. Andrew Eagle, PE, PTOE
Senior Transportation Engineer



Bridge and Approach Investigation Checklist

Project B-5700

Description Replace Bridge #45 over South River

Route SR 2030 (Hollow Bridge Rd)

Division 6

County Cumberland

Existing Speed Limit 55 mph ☐ Posted ☒ Statutory

Reasonable & Comfortable
Passenger Car Speed 55 mph

Speed Data Estimated 45-55 mph

Ball Bank Speed Study Curve North of bridge:
45 mph: NB Departure - 7, SB Approach - 6
50 mph: NB Departure - 10, SB Approach - 7
55 mph: NB Departure - 11, SB Approach - 10
Curve South of bridge:
45 mph: NB Approach - 12, SB Departure - 10
50 mph: NB Approach - 14, SB Departure - 11
55 mph: NB Approach - 16, SB Departure - 15

Warning Signs at Bridge NB - 2x Bridge End Delineators
SB - 2x Bridge End Delineators, Weight Limit (22 ton SV, 31 ton TTST, Next Three Bridges)

Roadside Development Undeveloped

ADT History 720 vpd (From NCDOT TEAAS)
620 vpd (From NCDOT Traffic Volume Map-2014)

Pedestrian/Bicycle Traffic Minimal Expected

Bridge and Approach
Digital Photos Attached

Approach Lane Width 9 ft

Approach Shoulder Width 2 ft paved, 8 ft grass (22 ft EOP to EOP)
Shoulder Type _____

Lane Width (existing bridge) 9 ft

Shoulder width (existing bridge) 5 ft (28 ft total width)

Strategic Corridor / Thoroughfare
Designation and Recommended
Cross Section SR 2030 is classified a minor collector facility in the Statewide Functional
Classification System. 2-lane cross-section recommended.

Crash History and
Safety Considerations Crash Analysis completed for 01/01/2006 to 12/31/2015. Two accidents
reported. One accident involved a fixed object and one involved a
moveable object.

Comments _____

Reasonable Bridge Speed 55 mph

Investigated by: J. Andrew Eagle, PE, PTOE

Reviewed by: 

County: Cumberland

Route: SR 2030 (Hollow Bridge Rd)

Date: 04/13/16

Northbound



Northbound

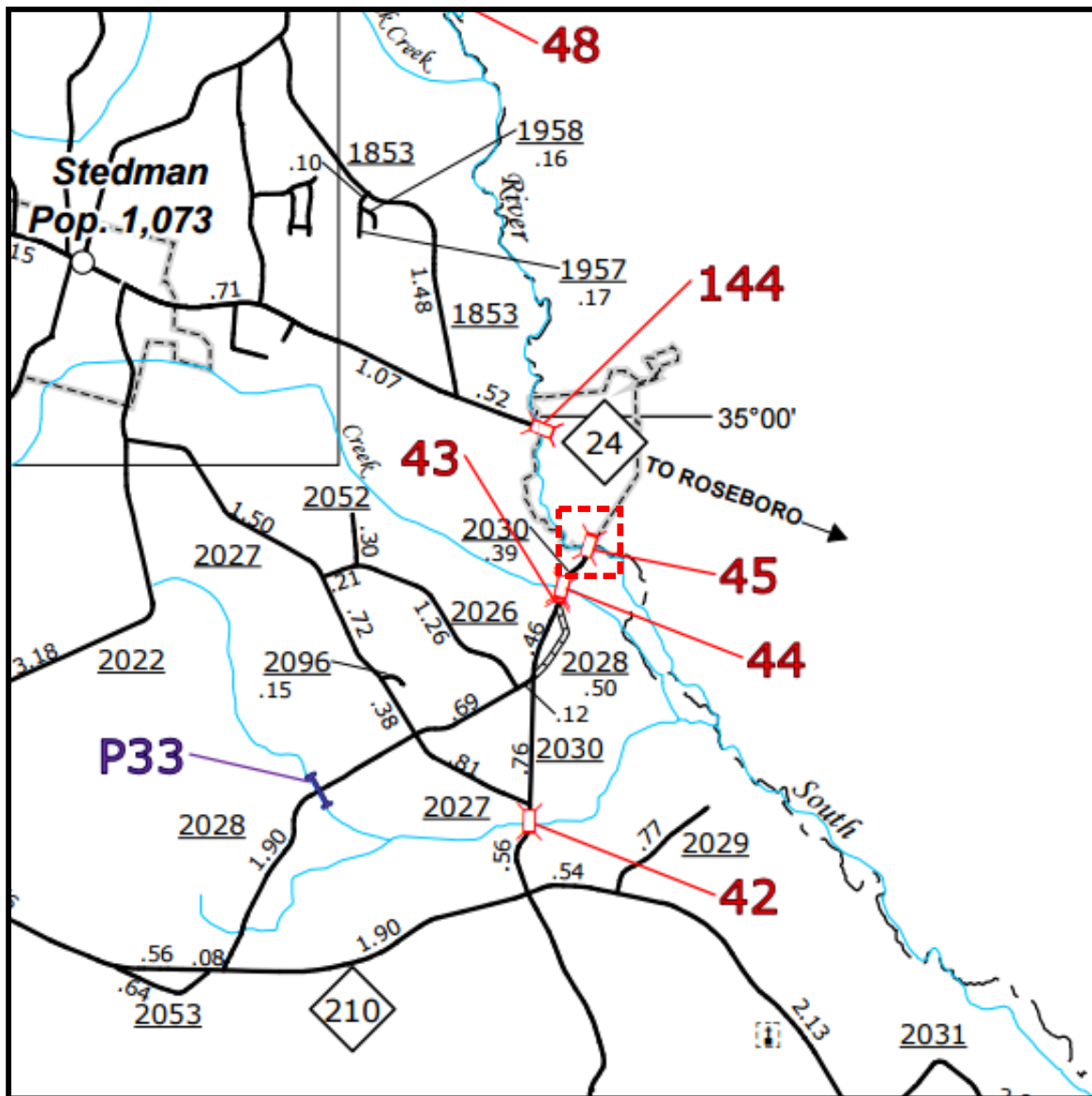


Southbound



Southbound





Bridge Location Map-Bridge #250045

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

Study Criteria Summary

County: CUMBERLAND **City:** All and Rural
Date: 01/01/2006 to 12/31/2015 **Study:** CUMBERLANDBRIDGE45
Location: 500 feet either side of Bridge No. 45 on SR 2030 (Polly Island Rd) / SR 1414 (Minnie Hall Rd) over South River
 SAMPSON & CUMBERLAND COUNTIES

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	102639790	0.091	07/11/2009 08:20	FIXED OBJECT	\$ 1000	0	0	0	0	1	5	1	1	0	13	1
Unit 1 : 1		Alchl/Drgs:	7	Speed:	55 MPH	Dir:	N	Veh Mnvr/Ped Actn:				4	Obj Strk:		33	
2	102270824	0.135	02/26/2008 11:00	MOVABLE OBJECT	\$ 1500	0	0	0	0	2	1	2	1	6	13	1
Unit 1 : 1		Alchl/Drgs:	0	Speed:	45 MPH	Dir:	N	Veh Mnvr/Ped Actn:				4	Obj Strk:		18	

**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	1	50.00
Wet Crashes	1	50.00
Alcohol/Drugs Involvement Crashes	0	0.00

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 = 720

Total Length = 0.23 (Miles) 0.37 (Kilometers)

Total Vehicle Exposure = 0.6 (MVMT) 0.97 (MVKMT)

Crash Rate	Crashes Per 100 Million Vehicle Miles	Crashes Per 100 Million Vehicle Kilometers
Total Crash Rate	330.70	205.49
Fatal Crash Rate	0.00	0.00
Non Fatal Crash Rate	0.00	0.00
Night Crash Rate	165.35	102.74
Wet Crash Rate	165.35	102.74
EPDO Rate	330.70	205.49

**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 = \$	2500.00

Accident Type Summary

Accident Type	Number of Crashes	Percent of Total
FIXED OBJECT	1	50.00
MOVABLE OBJECT	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	1	50.00
Mar	0	0.00
Apr	0	0.00
May	0	0.00
Jun	0	0.00
Jul	1	50.00
Aug	0	0.00
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	1	50.00
Wed	0	0.00
Thu	0	0.00
Fri	0	0.00
Sat	1	50.00
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	1	50.00
0900-0959	0	0.00
1000-1059	0	0.00
1100-1159	1	50.00
1200-1259	0	0.00
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	50.00
TREE	1	50.00

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

Miscellaneous Totals

Year	Property Damage	EPDO Index
2006	\$ 0	0.00
2007	\$ 0	0.00
2008	\$ 1500	1.00
2009	\$ 1000	1.00
2010	\$ 0	0.00

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

Year	Property Damage	EPDO Index
2011	\$ 0	0.00
2012	\$ 0	0.00
2013	\$ 0	0.00
2014	\$ 0	0.00
2015	\$ 0	0.00
Total	\$ 2500	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	1
2009	0	0	0	1	0	0	0
2010	0	0	0	0	0	0	0
2011	0	0	0	0	0	0	0
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	0
Total	0	0	0	1	0	0	1

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

Strip Diagram

Features	Milepost	Crash IDs
BEGIN STUDY	0.00	
	0.01	
	0.02	
	0.03	
	0.04	
	0.05	
	0.06	
	0.07	
	0.08	
	0.09	102639790
	0.10	
	0.11	
BRIDGE NO. 45 CUMBERLAND CL SAMPSON CL	0.12	
	0.13	
	0.14	102270824
	0.15	
	0.16	
	0.17	
	0.18	
	0.19	
	0.20	
	0.21	
	0.22	
END STUDY	0.23	

**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
CUMBERLANDBRIDGE45				76.8	8.4	720	

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
CUMBERLAND	26	6	All and Rural		0	01/01/2006	12/31/2015	10.00

Location Text	Requestor
500 feet either side of Bridge No. 45 on SR 2030 (Polly Island Rd) / SR 1414 (Minnie Hall Rd) over South River SAMPSON & CUMBERLAND COUNTIES	

Included Accidents	Old MP	New MP	Type
102270824		0.135	I
102639790		0.091	I

Fiche Roads

Name	Code
I 1	10000001
MINNIE-HALL	50020215
SR 2030	40002030
SR 1414	40001414

Strip Road

Name	Code	Begin MP	End MP	Miles	Kilometers
I 1	10000001	0.000	0.230	0.230	0.370