
Bridge Design Speed Investigation

010246

Structure #246 on SR 1111 (Carrigan Road) over Stirewalt Creek

Alexander County



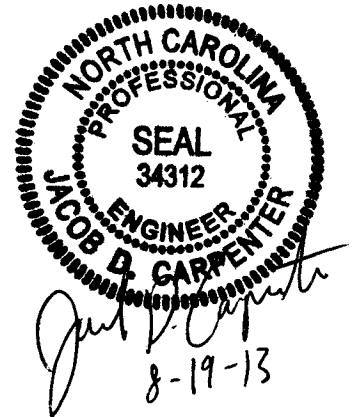
Document Prepared By:

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

August 19, 2013

Principal Investigator & Project Manager

Jacob D. Carpenter, PE
Regional Manager



Bridge and Approach Investigation Checklist

Project W02866

Description Bridge # 246 over Stirewalt Creek

Route SR 1111 (Carrigan Road)

Division 12

County Alexander

Existing Speed Limit 45 ☒ Posted ☐ Statutory

Reasonable & Comfortable Passenger Car Speed 50

Speed Data Observed estimated speeds of 40-50 mph.

Ball Bank Speed Study Bridge Speed good at 50 mph per BBI

Warning Signs at Bridge 4 Guardrail Ends

Roadside Development Residential, Wooded

ADT History 1,000 vpd (2012)

Pedestrian/Bicycle Traffic Minimal expected

Bridge and Approach Digital Photos Attached

Approach Lane Width 9 ft

Approach Shoulder Width 6-10 ft

Shoulder Type grass

Lane Width (existing bridge) 9 ft

Shoulder width (existing bridge) 2 ft (South side) 3 ft (North side) (~23 ft total width)

Strategic Corridor / Thoroughfare Designation and Recommended Cross Section SR 1111 is classified as a rural local facility in the Statewide Functional Classification System. 2-lane cross-section recommended.

Crash History and Safety Considerations Crash analysis completed for 5/1/2008 to 4/30/2013. Two collisions reported, each fixed object collisions, one with an embankment and one with a mailbox.

Comments Bridge in tangent, curver north of bridge. Stop sign south of bridge prevents acceleration to full speed (35mph max) northbound. Comfortable speed southbound after curve 45 mph.

Reasonable Bridge Speed 45

Investigated by: Jacob D. Carpenter, PE

Reviewed by: 

Eastbound



Eastbound

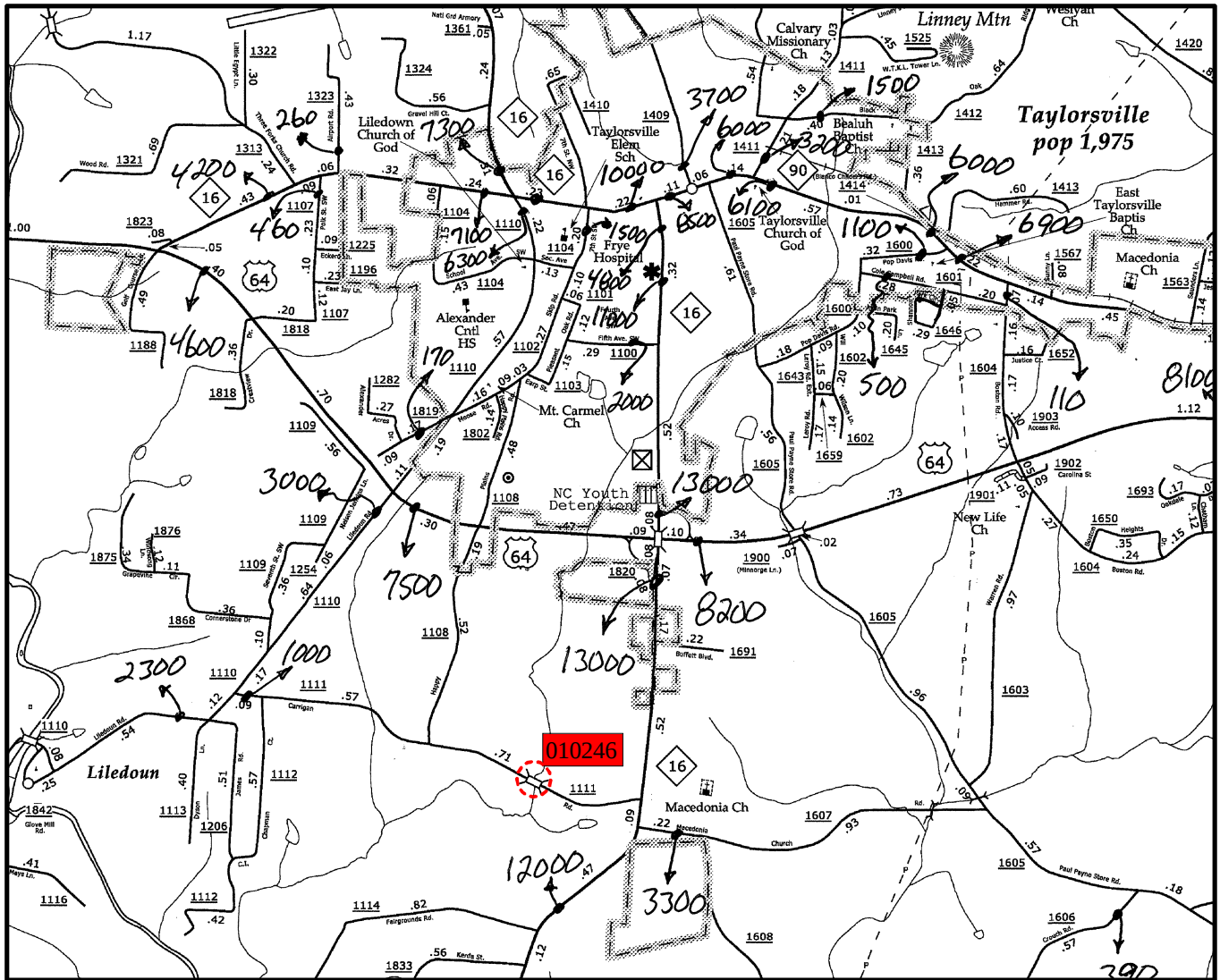


Westbound



Westbound





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

Study Criteria Summary

County: ALEXANDER **City:** All and Rural
Date: 5/1/2008 **to** 4/30/2013 **Study:** ALEXANDERBRIDGE246
Location: SR 1111 (Carrigan Rd), 500 feet either side of Bridge 246

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	103047526	0.973	12/15/2010 16:00	FIXED OBJECT	\$ 6500	0	0	0	0	1	1	1	5	0	13	1
Unit 1 : 1 Alchl/Drgs: 0 Speed: 60 MPH Dir: W Veh Mnvr/Ped Actn: 4 Obj Strk: 59																
2	102763824	0.979	12/19/2009 16:11	FIXED OBJECT	\$ 3650	0	0	0	0	5	1	2	3	0	13	1
Unit 1 : 2 Alchl/Drgs: 0 Speed: 45 MPH Dir: W Veh Mnvr/Ped Actn: 4 Obj Strk: 60																

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	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	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 = 1600

Total Length = 0.194 (Miles) 0.312 (Kilometers)

Total Vehicle Exposure = 0.57 (MVMT) 0.91 (MVKMT)

Crash Rate	Crashes Per 100 Million Vehicle Miles	Crashes Per 100 Million Vehicle Kilometers
Total Crash Rate	352.86	219.26
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	352.86	219.26

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Miscellaneous Statistics

Severity Index =	1.00
EPDO Crash Index =	2.00
Estimated Property Damage Total = \$	10150.00

Accident Type Summary

Accident Type	Number of Crashes	Percent of Total
FIXED OBJECT	2	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	0	0.00
Class C Injuries	0	0.00
Total Non-Fatal Injuries	0	0.00
Total Injuries	0	0.00

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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	0	0.00
Aug	0	0.00
Sep	0	0.00
Oct	0	0.00
Nov	0	0.00
Dec	2	100.00

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	0	0.00
Sat	1	50.00
Sun	0	0.00

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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	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	0	0.00
1600-1659	2	100.00
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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Light and Road Conditions Summary

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

Object Struck Summary

Object Type	Times Struck	Percent of Total
EMBANKMENT	1	50.00
MAILBOX	1	50.00

Vehicle Type Summary

Vehicle Type	Number Involved	Percent of Total
PASSENGER CAR	1	50.00
PICKUP	1	50.00

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Yearly Totals Summary

Accident Totals

Year	Total Accidents	Fatal Accidents	Injury Accidents	Property Damage Only Accidents
2008	0	0	0	0
2009	1	0	0	1
2010	1	0	0	1
2011	0	0	0	0
2012	0	0	0	0
2013	0	0	0	0
Total	2	0	0	2

Injury Totals

Year	Fatal Injuries	Class A, B, or C Injuries
2008	0	0
2009	0	0
2010	0	0
2011	0	0
2012	0	0
2013	0	0
Total	0	0

Miscellaneous Totals

Year	Property Damage	EPDO Index
2008	\$ 0	0.00
2009	\$ 3650	1.00
2010	\$ 6500	1.00
2011	\$ 0	0.00
2012	\$ 0	0.00
2013	\$ 0	0.00
Total	\$ 10150	2.00

Type of Accident Totals

Year	Left Turn	Right Turn	Rear End	Run Off Road & Fixed Object	Angle	Side Swipe	Other
2008	0	0	0	0	0	0	0
2009	0	0	0	1	0	0	0

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Year	Run Off Road &						
	Left Turn	Right Turn	Rear End	Fixed Object	Angle	Side Swipe	Other
2010	0	0	0	1	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
Total	0	0	0	2	0	0	0

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Strip Diagram

Features	Milepost	Crash IDs
	0.92	
	0.93	
	0.94	
	0.95	
	0.96	
	0.97	103047526
	0.98	102763824
	0.99	
	1.00	
	1.01	
	1.02	
	1.03	
	1.04	
	1.05	
	1.06	
	1.07	
	1.08	
	1.09	
	1.10	
	1.11	
	1.12	

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Study Criteria

Study Name	Log No.	PH No.	TIP No.	K/A Cf.	B/C Cf.	ADT	ADT Route
ALEXANDERBRIDGE246				76.8	8.4	1600	40001111

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
ALEXANDER	1	12	All and Rural		0	5/1/2008	4/30/2013	5.00

Location Text	Requestor
SR 1111 (Carrigan Rd), 500 feet either side of Bridge 246	

Included Accidents	Old MP	New MP	Type
102763824		0.979	I

Fiche Roads	
Name	Code
SR 1111	40001111
CARRIGAN	50005136

Strip Road					
Name	Code	Begin MP	End MP	Miles	Kilometers
SR 1111	40001111	0.922	1.116	0.194	0.312