

Bridge Design Speed Investigation

Bridge #31 on NC 226 over Spring Creek
Mitchell County



Document Prepared By:

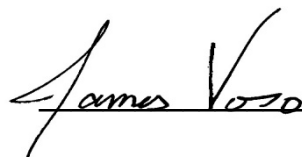
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Commission No: 3350

July 22, 2013



Investigating Engineer


James Voso, PE

Bridge and Approach Investigation Checklist

Project 17BP.13.PE.1
Description Replace Bridge #31 on NC 226 over Spring Creek
Route NC 226
Division 13
County Mitchell

Existing Speed Limit 40 mph ☒ Posted ☐ Statutory

Reasonable & Comfortable
Passenger Car Speed 40 mph

Speed Data N/A

Ball Bank Speed Study Curve north of Bridge #31 had a ball bank indication of 10 at 35 mph.

Warning Signs at Bridge 4 Bridge End Delineators, Weight Limit not posted, Narrow Bridge warning sign

Roadside Development Wooded south of bridge and farm land north of bridge.

ADT History 1,000 (2011), 1,100 (2010), 850 (2009), 840 (2008), 940 (2007), 890 (2006), 960 (2004), 990 (2003), 1,100 (2002), 1,100 (2001), 1,100 (2000), 1,000 (1999)

Pedestrian/Bicycle Traffic None

Bridge and Approach
Digital Photos (attached)

Approach Lane Width 10'

Approach Shoulder Width: 6'
Shoulder Type grass

Lane Width (existing bridge) 9'

Shoulder width (existing bridge) 4.5'

Strategic Corridor / Thoroughfare
Designation and Recommended
Cross Section Not a Strategic Corridor/Thoroughfare. Two lane cross section at 40 mph based on 3R guidelines.

Crash History and
Safety Considerations Three crashes (one "Sideswipe, Opposite Direction" type and two "Overturn /Rollover" type) reported near bridge (5/1/2003 - 4/30/2013, 10 years).

Comments Winding Road warning sign posted south of bridge. Bridge Ices Before Road advisory sign posted near bridge. Bridge number posted on bridge. Toms Creek Rd intersects NC 226 at the northern terminus of the bridge with stop control on the Toms Creek Rd approach.

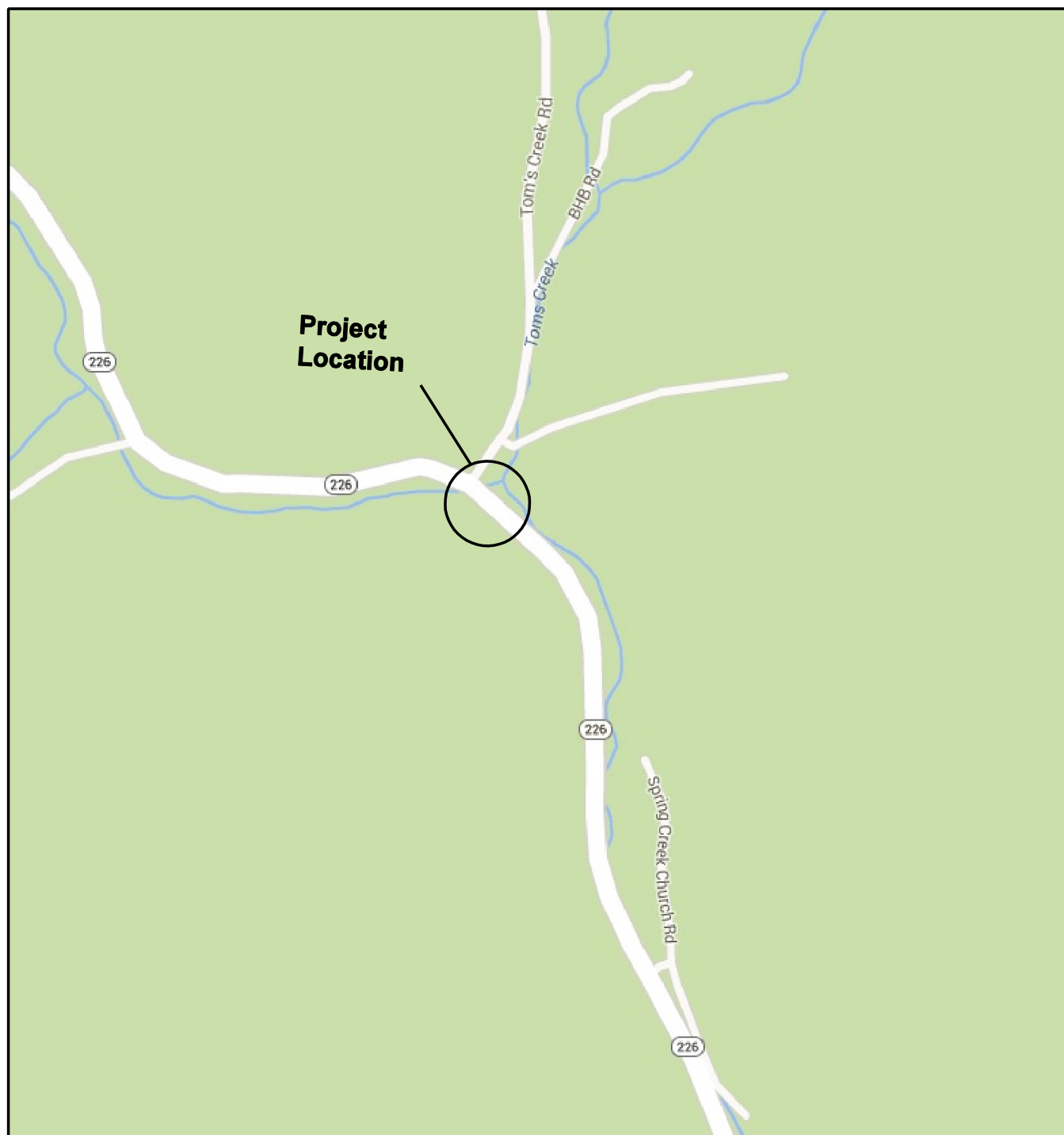
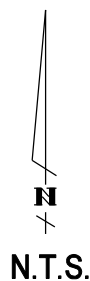
Reasonable Bridge Speed 40 mph

Investigated by: Mathew Bolden Reviewed by: James Voso

Bridge #31

Mitchell County

Division 13



VICINITY MAP

Bridge #31 on NC 226
over Spring Creek



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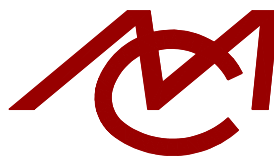


Northbound Approach



Northbound Approach at bridge

Bridge #31 on NC 226
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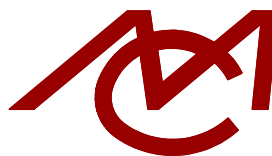


Southbound Approach



Southbound Approach at bridge

Bridge #31 on NC 226
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**North Carolina Department of Transportation
Traffic Engineering Accident Analysis System
Strip Analysis Report**

Study Criteria Summary

County: MITCHELL **City:** All and Rural
Date: 5/1/2003 **to** 4/30/2013 **Study:** MITCHELLBRIDGE31
Location: NC 226 from 500 feet east of Bridge 31 to 500 feet west of the bridge

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	102771575	29.172	01/19/2010 05:50	OVERTURN/ROLLOVER	\$ 6500	0	0	0	0	4	5	2	5	0	13	1
Unit 1 : 1 Alchl/Drugs: 0 Speed: 35 MPH Dir: S Veh Mnvr/Ped Actn: 4 Obj Strk:																
2	102747025	29.248	12/14/2009 10:15	SIDESWIPE, OPPOSITE DIRECTION	\$ 17000	0	0	1	0	4	1	2	7	0	13	1
Unit 1 : 2 Alchl/Drugs: 0 Speed: 40 MPH Dir: S Veh Mnvr/Ped Actn: 4 Obj Strk:																
Unit 2 : 1 Alchl/Drugs: 0 Speed: 35 MPH Dir: N Veh Mnvr/Ped Actn: 4 Obj Strk:																
3	103061762	29.278	01/05/2011 16:30	OVERTURN/ROLLOVER	\$ 6000	0	0	0	0	5	1	4	7	0	13	1
Unit 1 : 2 Alchl/Drugs: 0 Speed: 15 MPH Dir: S Veh Mnvr/Ped Actn: 4 Obj Strk:																

**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/Drugs - Alcohol Drugs Suspected
Veh Mnvr/Ped Actn - Vehicle Maneuver/Pedestrian Action
Obj Strk - Object Struck

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Strip Analysis Report

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	1	33.33
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 = 840

Total Length = 0.194 (Miles) 0.312 (Kilometers)

Total Vehicle Exposure = 0.6 (MVMT) 0.96 (MVKMT)

Crash Rate	Crashes Per 100 Million Vehicle Miles	Crashes Per 100 Million Vehicle Kilometers
Total Crash Rate	503.95	313.14
Fatal Crash Rate	0.00	0.00
Non Fatal Crash Rate	167.98	104.38
Night Crash Rate	167.98	104.38
Wet Crash Rate	0.00	0.00
EPDO Rate	1747.04	1085.56

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Traffic Engineering Accident Analysis System
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Miscellaneous Statistics

Severity Index =	3.47
EPDO Crash Index =	10.40
Estimated Property Damage Total = \$	29500.00

Accident Type Summary

Accident Type	Number of Crashes	Percent of Total
OVERTURN/ROLLOVER	2	66.67
SIDESWIPE, OPPOSITE DIRECTION	1	33.33

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

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Traffic Engineering Accident Analysis System
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Monthly Summary

Month	Number of Crashes	Percent of Total
Jan	2	66.67
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	1	33.33

Daily Summary

Day	Number of Crashes	Percent of Total
Mon	1	33.33
Tue	1	33.33
Wed	1	33.33
Thu	0	0.00
Fri	0	0.00
Sat	0	0.00
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	1	33.33
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	0	0.00
1500-1559	0	0.00
1600-1659	1	33.33
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	0	0	2	2
Dark	0	0	1	1
Other	0	0	0	0
Total	0	0	3	3

Vehicle Type Summary

Vehicle Type	Number Involved	Percent of Total
PASSENGER CAR	2	50.00
PICKUP	2	50.00

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Yearly Totals Summary

Accident Totals

Year	Total Accidents	Fatal Accidents	Injury Accidents	Property Damage Only Accidents
2003	0	0	0	0
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	1	0	1	0
2010	1	0	0	1
2011	1	0	0	1
2012	0	0	0	0
2013	0	0	0	0
Total	3	0	1	2

Injury Totals

Year	Fatal Injuries	Class A, B, or C Injuries
2003	0	0
2004	0	0
2005	0	0
2006	0	0
2007	0	0
2008	0	0
2009	0	1
2010	0	0
2011	0	0
2012	0	0
2013	0	0
Total	0	1

Miscellaneous Totals

Year	Property Damage	EPDO Index
2003	\$ 0	0.00
2004	\$ 0	0.00

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Year	Property Damage	EPDO Index
2005	\$ 0	0.00
2006	\$ 0	0.00
2007	\$ 0	0.00
2008	\$ 0	0.00
2009	\$ 17000	8.40
2010	\$ 6500	1.00
2011	\$ 6000	1.00
2012	\$ 0	0.00
2013	\$ 0	0.00
Total	\$ 29500	10.40

Type of Accident Totals

Year	Left Turn	Right Turn	Rear End	Run Off Road & Fixed Object	Angle	Side Swipe	Other
2003	0	0	0	0	0	0	0
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	1	0
2010	0	0	0	0	0	0	1
2011	0	0	0	0	0	0	1
2012	0	0	0	0	0	0	0
2013	0	0	0	0	0	0	0
Total	0	0	0	0	0	1	2

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Strip Analysis Report

Strip Diagram

Features	Milepost	Crash IDs
Structure:600031 SR 1329	29.14	
	29.15	
	29.16	
	29.17	102771575
	29.18	
	29.19	
	29.20	
	29.21	
	29.22	
	29.23	
	29.24	
	29.25	102747025
	29.26	
	29.27	
	29.28	103061762
	29.29	
	29.30	
	29.31	
	29.32	
	29.33	

**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
MITCHELLBRIDGE31				76.8	8.4	840	30000226

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
MITCHELL	60	13	All and Rural		0	5/1/2003	4/30/2013	10.00

Location Text	Requestor
NC 226 from 500 feet east of Bridge 31 to 500 feet west of the bridge	

Fiche Roads	
Name	Code
NC 226	30000226
NC 226ALT	31000226

Strip Road					
Name	Code	Begin MP	End MP	Miles	Kilometers
NC 226	30000226	29.140	29.334	0.194	0.312