

Bridge Design Speed Investigation

Bridge #213 on SR 1197 (Bear Creek Road) over Bear Creek
Mitchell County



Document Prepared By:

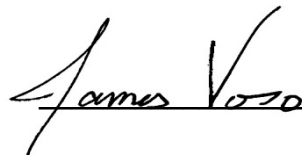
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Consulting Engineers - Surveyors
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Commission No: 3350

July 22, 2013



Investigating Engineer


James Voso, PE

Bridge and Approach Investigation Checklist

Project 17BP.13.PE.1
Description Replace Bridge #213 on SR 1197 (Bear Creek Road) over Bear Creek
Route SR 1197 (Bear Creek Road)
Division 13
County Mitchell

Existing Speed Limit 35 mph ☒ Posted ☐ Statutory

Reasonable & Comfortable
Passenger Car Speed 25 mph

Speed Data N/A

Ball Bank Speed Study Curve north of Bridge #213 had a ball bank indication of 13 at 20 mph.

Warning Signs at Bridge 4 Bridge End Delineators, Weight Limit (25 tons - single vehicle,
37 tons - truck tractor semitrailer), One Lane Bridge warning sign

Roadside Development Wooded in all quadrants of bridge.

ADT History 760 (2011), 820 (2009), 1,100 (2007), 1,000 (2005), 860 (2003)

Pedestrian/Bicycle Traffic Low

Bridge and Approach
Digital Photos (attached)

Approach Lane Width 9'

Approach Shoulder Width: 7'
Shoulder Type grass

Lane Width (existing bridge) 16' one lane

Shoulder width (existing bridge) 1'

Strategic Corridor / Thoroughfare
Designation and Recommended
Cross Section Not a Strategic Corridor/Thoroughfare. Two lane cross section at 25
mph based on 3R guidelines.

Crash History and
Safety Considerations Two crashes (one "Fixed Object" type and one "Overturn/Rollover" type)
reported near bridge (5/1/2003 - 4/30/2013, 10 years).

Comments Stop Ahead warning sign posted south of bridge. Access road located just
north of bridge. Bridge number posted on bridge.

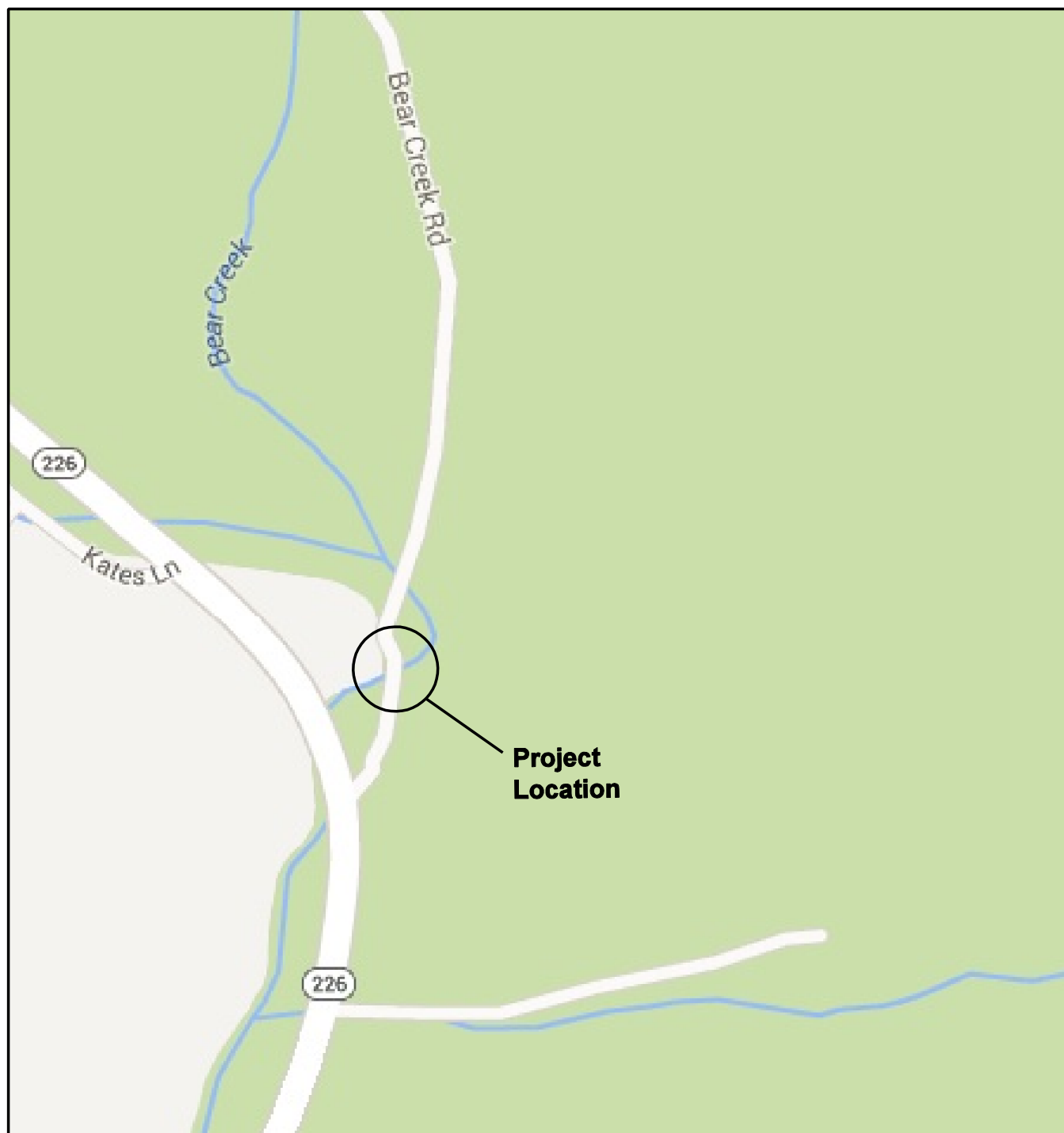
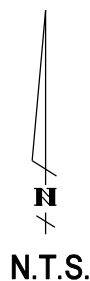
Reasonable Bridge Speed 25 mph

Investigated by: Mathew Bolden Reviewed by: James Voso

Bridge #213

Mitchell County

Division 13



VICINITY MAP

Bridge #213 on SR 1197
(Bear Creek Road)
over Bear Creek



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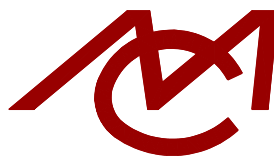


Northbound Approach



Northbound Approach at bridge

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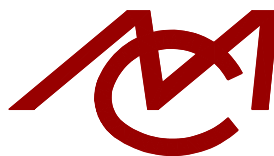


Southbound Approach



Southbound Approach at bridge

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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: 05/01/2003 **to** 04/30/2013 **Study:** MITCHELLBRIDGE213
Location: SR 1197 from NC 226 to 500 feet east of Bridge 213

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	101116259	0.100	02/12/2004 05:30	OVERTURN/ROLLOVER	\$ 8000	0	0	1	0	5	5	4		0		
Unit 1 : 4 Alchl/Drgs: 0 Speed: 0 MPH Dir: W Veh Mnvr/Ped Actn: 4 Obj Strk: 33																
2	103680815	0.100	02/16/2013 22:30	FIXED OBJECT	\$ 6000	0	0	0	0	5	5	4	5	1	13	2
Unit 1 : 4 Alchl/Drgs: 0 Speed: 20 MPH Dir: S 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

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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	1	50.00
Total Injury Crashes	1	50.00
Property Damage Only Crashes	1	50.00
Night Crashes	2	100.00
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	1	50.00
Class C Crashes	0	0.00
Property Damage Only Crashes	1	50.00

Vehicle Exposure Statistics

Annual ADT = 960

Total Length = 0.181 (Miles) 0.291 (Kilometers)

Total Vehicle Exposure = 0.63 (MVMT) 1.02 (MVKMT)

Crash Rate	Crashes Per 100 Million Vehicle Miles	Crashes Per 100 Million Vehicle Kilometers
Total Crash Rate	315.09	195.79
Fatal Crash Rate	0.00	0.00
Non Fatal Crash Rate	157.54	97.89
Night Crash Rate	315.09	195.79
Wet Crash Rate	0.00	0.00
EPDO Rate	1480.91	920.19

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Traffic Engineering Accident Analysis System
Strip Analysis Report**

Miscellaneous Statistics

Severity Index =	4.70
EPDO Crash Index =	9.40
Estimated Property Damage Total = \$	14000.00

Accident Type Summary

Accident Type	Number of Crashes	Percent of Total
FIXED OBJECT	1	50.00
OVERTURN/ROLLOVER	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	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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Monthly Summary

Month	Number of Crashes	Percent of Total
Jan	0	0.00
Feb	2	100.00
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	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	1	50.00
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	1	50.00
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	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	1	50.00
2300-2359	0	0.00

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Light and Road Conditions Summary

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

Object Struck Summary

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

Vehicle Type Summary

Vehicle Type	Number Involved	Percent of Total
SPORT UTILITY	2	100.00

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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	1	0	1	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	0	0	0	0
2012	0	0	0	0
2013	1	0	0	1
Total	2	0	1	1

Injury Totals

Year	Fatal Injuries	Class A, B, or C Injuries
2003	0	0
2004	0	1
2005	0	0
2006	0	0
2007	0	0
2008	0	0
2009	0	0
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	\$ 8000	8.40

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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	\$ 0	0.00
2010	\$ 0	0.00
2011	\$ 0	0.00
2012	\$ 0	0.00
2013	\$ 6000	1.00
Total	\$ 14000	9.40

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	1
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	0	0	0	0
2012	0	0	0	0	0	0	0
2013	0	0	0	1	0	0	0
Total	0	0	0	1	0	0	1

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Strip Analysis Report

Strip Diagram

Features	Milepost	Crash IDs
NC 226	0.00	
	0.01	
	0.02	
	0.03	
	0.04	
	0.05	
	0.06	
	0.07	
Structure:600213	0.08	
	0.09	
	0.10	101116259 103680815
Structure:600042	0.11	
	0.12	
	0.13	
	0.14	
	0.15	
	0.16	
	0.17	
	0.18	

North Carolina Department of Transportation
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Strip Analysis Report

Study Criteria

Study Name	Log No.	PH No.	TIP No.	K/A Cf.	B/C Cf.	ADT	ADT Route
MITCHELLBRIDGE213				76.8	8.4	960	40001197

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	05/01/2003	04/30/2013	10.00

Location Text	Requestor
SR 1197 from NC 226 to 500 feet east of Bridge 213	

Included Accidents	Old MP	New MP	Type
101116259	0	0.1	R

Excluded Accidents
100956425
100986013
101658315
101866565
101778023

Fiche Roads	
Name	Code
SR 1197	40001197
BEAR CREEK	50001997

Strip Road					
Name	Code	Begin MP	End MP	Miles	Kilometers
SR 1197	40001197	0.000	0.181	0.181	0.291