

Spot Safety Project Evaluation

Project Information

Order ID: 41000033825

Project ID: 10-10-10

Location: NC 24/NC 27 at SR 1125 (Bethel Church Rd)

County: Cabarrus

City: Midland

Division: 10

Signal ID: 10-0974

Countermeasure: Install fully actuated two phase traffic signal (2011)
Install back plates with reflective strips and oversized Signal Ahead signs (2013)

Project Completion: May 3, 2011 (Signal) Project Cost: \$64,000
October 24, 2013 (Signal back plates)

Map and Aerial (from Google Maps – Coordinates are 35.249503, -80.538624)



Naive Before and After Analysis

- Before Period: April 1, 2008 through March 31, 2011 (3 years)
- Const. Period 1 (Signal): April 1, 2011 through June 30, 2011
- After Period 1: July 1, 2011 through September 30, 2013 (2 years, 3 months)
- Const. Period 2 (Back plates): October 1, 2013 through October 31, 2013
- After Period 2: November 1, 2013 through April 30, 2015 (1 year, 6 months)
- Analysis Criteria: Treatment data consisted of all crashes within 150 feet of the subject intersection for the NC 24/NC 27 and SR 1125 approaches.
- Target Crashes: Frontal Impact Crashes (left-turn, same roadway; left-turn, different roadway; right-turn, same roadway; right-turn, different roadway; head-on; and angle crashes) in the intersection.

<u>Treatment Information</u>	Before 3 yrs.	After 1 2 yrs., 3 mos.	After 2 1 yr, 6 mos.
Total Crashes	14	8	3
Total Crashes Per Year	4.67	3.56	2.00
Total Severity Index	6.29	12.33	3.47
Target Crashes	11	5	1
Target Crashes Per Year	3.67	2.22	0.67
Target Crash Severity Index	6.38	19.12	8.40
Volume (2009, 2012, 2014)	18,100	18,300	18,700

<u>Injury Crash Summary (Per Year)</u>	Before 3 yrs.	After 1 2 yrs., 3 mos.	After 2 1 yr, 6 mos.
Fatal injury Crashes	0.00	0.44	0.00
Class A injury Crashes	0.00	0.00	0.00
Class B injury Crashes	1.00	0.00	0.00
Class C Injury Crashes	2.33	0.89	0.67
Property Damage Only	1.33	2.22	1.33

<u>Additional Information</u>	Before	After 1	After 2
Frontal Impact Crashes (Target)	11	5	1
Frontal Impact Crashes Per Year	3.67	2.22	0.67
Angle Crashes	7	2	1
Angle Crashes Per Year	2.33	0.89	0.67
NC 24 Ran Red Light Crashes	N/A	3	1
NC 24 Ran Red Light Crashes Per Year	N/A	1.33	0.67

Table 1 Summary Results

	<u>From Before to After 1 (Signal)</u>		<u>From After 1 to After 2 (Signal back plate)</u>	
Total Crashes per year:	- 24 %	(reduction)	- 44 %	(reduction)
Total Crash Severity:	+ 96 %	(increase)	- 72 %	(reduction)
Target Crashes per year:	- 40 %	(reduction)	- 80 %	(reduction)
Target Crash Severity:	+ 200 %	(increase)	- 56 %	(reduction)
Volume:	+ 1 %	(increase)	+ 2 %	(increase)

Additional Summary Results

	<u>From Before to After 1 (Signal)</u>		<u>From After 1 to After 2 (Signal back plate)</u>	
Frontal Impact Crashes: per year (Target)	- 40 %	(reduction)	- 80 %	(reduction)
Angle Crashes per year:	- 62 %	(reduction)	- 25 %	(reduction)
Ran Red Light Crashes: per year	N/A		- 50 %	(reduction)

Items for Discussion/Concerns

The study intersection experienced a 24 % reduction (4.67 to 3.56 crashes per year) from Before to After 1 and a 44 % reduction (3.56 to 2.00 crashes per year) from After 1 to After 2.

The target crashes per year (Frontal Impact Crashes) experienced a 40 % reduction (3.67 to 2.22 crashes per year) from Before to After 1 and an 80 % reduction (2.22 to 0.67 crashes per year) from After 1 to After 2.

The intersection experienced a reduction in Angle Crashes per year in from Before to After 1 (1.91 to 0.89 crashes per year) and from After 1 to After 2 (0.89 to 0.67 crashes per year). The intersection also experienced a decrease in NC 24/NC 27 Running Red Light Crashes per year (1.33 to 0.67 crashes per year) from the After 1 to After 2 period.

Data Prepared For

The Traffic Safety Unit *of the*
Transportation Mobility and Safety Division *of the*
Division of Highways *of the*
North Carolina Department of Transportation

Data Prepared By

Principal Investigator: Andrew Covington, EI

Work Group/Consultant: AECOM

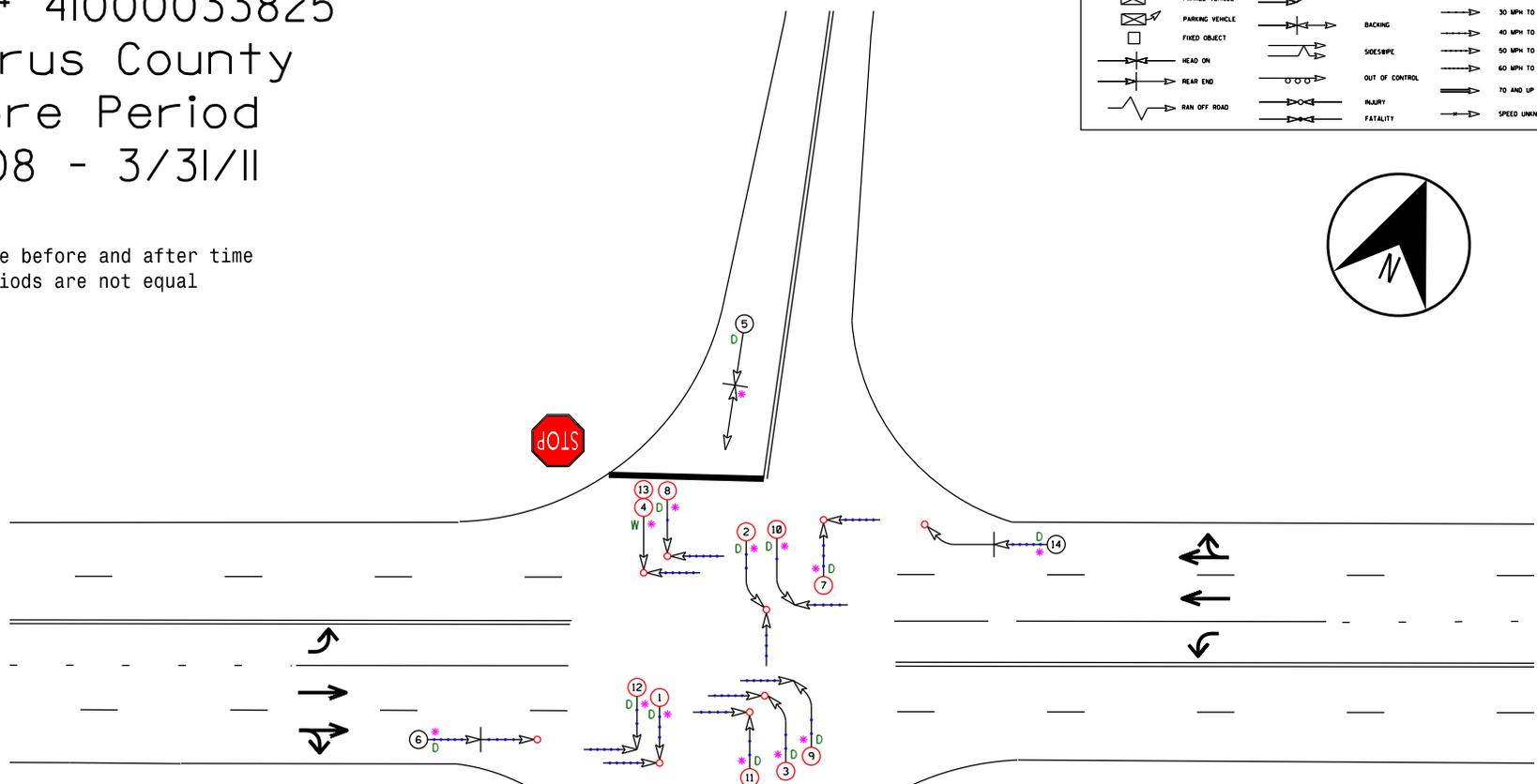
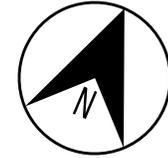
Date: June 12, 2015

SS# 10-10-10
 Order # 41000033825
 Cabarrus County
 Before Period
 4/1/08 - 3/31/11

Note: The before and after time periods are not equal

SR 1125 (Bethel Church Rd)
 45 MPH
 2009 ADT 1,450

		LEGEND	
	MOVING VEHICLE		ANGLE
	PEDESTRIAN		TURNING
	PARKING VEHICLE		BACKING
	FIXED OBJECT		SWERVE
	HEAD ON		OUT OF CONTROL
	REAR END		INJURY
	RAN OFF ROAD		FATALITY
			0 MPH OR LESS
			10 MPH TO 19
			20 MPH TO 29
			30 MPH TO 39
			40 MPH TO 49
			50 MPH TO 59
			60 MPH TO 69
			70 AND UP
			SPEED UNKNOWN
			P PEDESTRIAN
			T TRAIN
			• DRIVER AT FAULT
			D DRY
			W WET
			I ICY OR SNOWY
			O ONLY

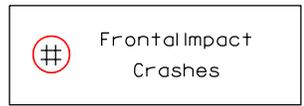
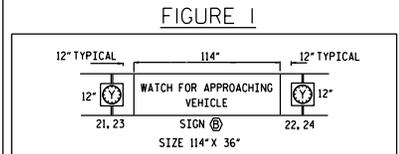
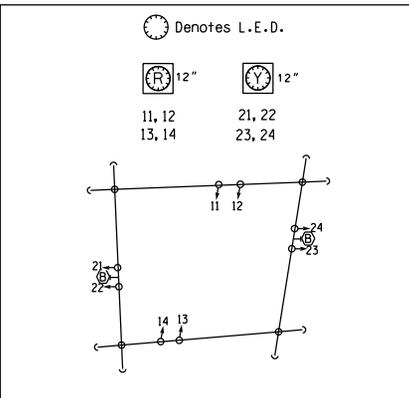


NC 24/NC 27
 55 MPH
 2009 ADT 17,000

NC 24/NC 27
 55 MPH
 2009 ADT 16,500

SR 1125 (Bethel Church Rd)
 45 MPH
 2009 ADT 1,300

SIG ID 10-0974 (Actuated Flasher)



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Prepared For:
 N.C. DEPARTMENT of TRANSPORTATION
 DIVISION of HIGHWAYS
 TRANSPORTATION MOBILITY and SAFETY DIVISION

TRAFFIC SAFETY UNIT

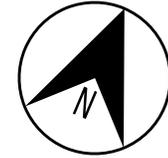
Date: 6-12-2015
 Prepared By: Andrew Covington, EI

SS# 10-10-10
 Order # 41000033825
 Cabarrus County
 After Period I
 7/1/11 - 9/30/13

SR 1125 (Bethel Church Rd)
 45 MPH
 2012 ADT 1,400

LEGEND

	MOVING VEHICLE		ANGLE		1 MPH OR LESS		PEDESTRIAN
	PEDESTRIAN		TURNING		10 MPH TO 19		TRAIN
	PAKED VEHICLE		BACKING		20 MPH TO 29		DRIVER AT FAULT
	PAKING VEHICLE		SLOESWPE		30 MPH TO 39		DRY
	FIXED OBJECT		OUT OF CONTROL		40 MPH TO 49		WET
	HEAD ON		HURRY		50 MPH TO 59		ICY OR SNOW
	NEAR END		FATALITY		60 MPH TO 69		SPEED UNKNOWN
	RAN OFF ROAD				70 AND UP		ONLY

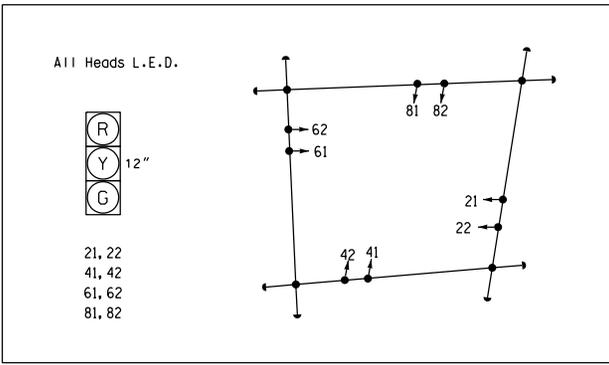


Note: The before and after time periods are not equal

NC 24/NC 27
 55 MPH
 2012 ADT 17,000

NC 24/NC 27
 55 MPH
 2012 ADT 17,000

SIG ID 10-0974 (2 Phase Fully Actuated)



SR 1125 (Bethel Church Rd)
 45 MPH
 2012 ADT 1,100

Frontal Impact Crashes

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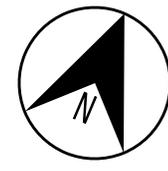
Date: 6-12-2015 Prepared By: Andrew Covington, EI

SS# 10-10-10
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 Cabarrus County
 After Period 2
 11/1/13 - 4/30/15

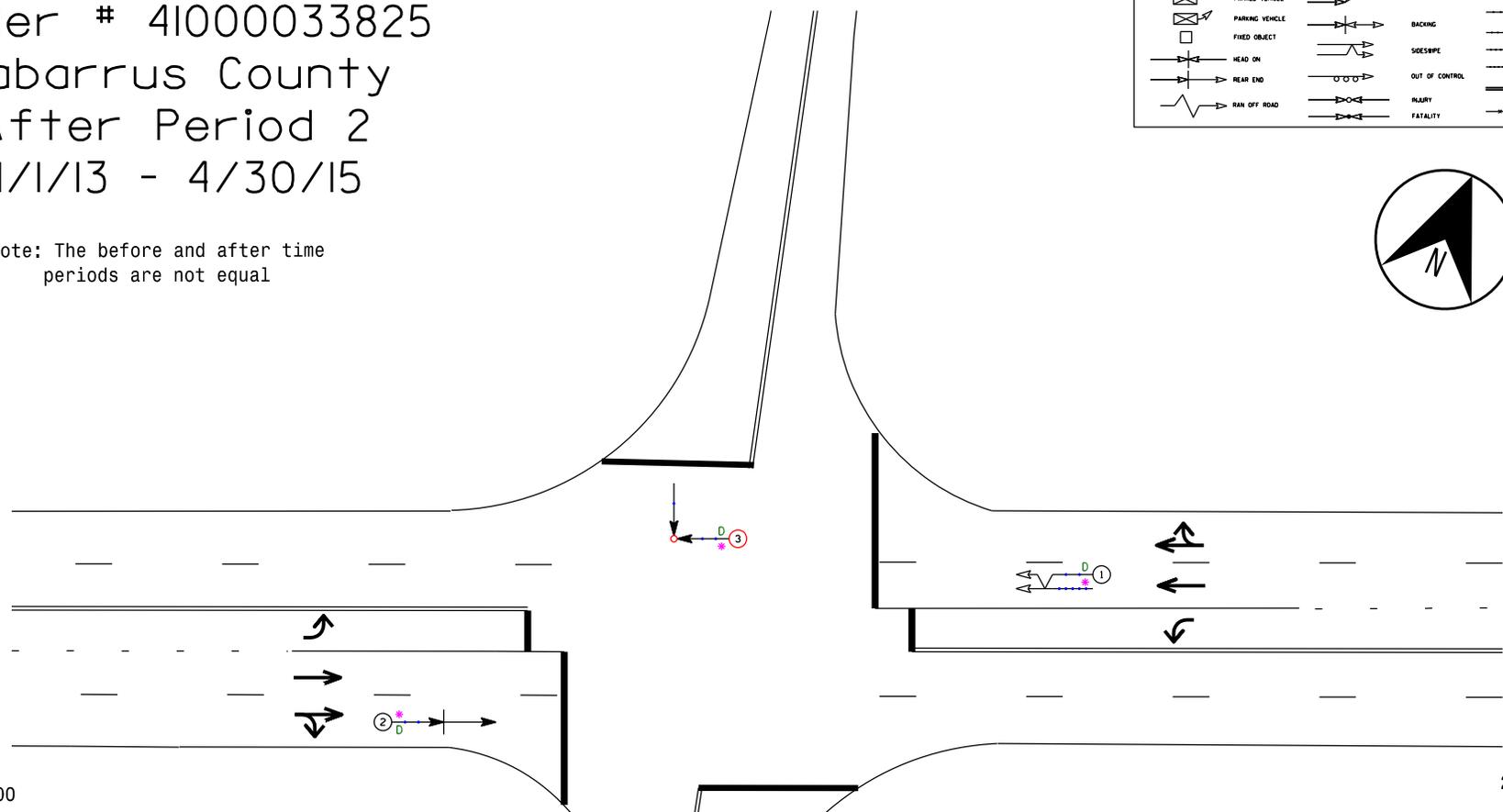
SR 1125 (Bethel Church Rd)
 45 MPH
 2014 ADT 1,400

LEGEND

	MOVING VEHICLE		ANGLE		1 MPH OR LESS		PEDESTRIAN
	PEDESTRIAN		TURNING		10 MPH TO 19		TRAIN
	PARKED VEHICLE		BACKING		20 MPH TO 29		DRIVER AT FAULT
	PARKING VEHICLE		SLOESLOPE		30 MPH TO 39		DRY
	FIXED OBJECT		OUT OF CONTROL		40 MPH TO 49		WET
	HEAD ON		HIT AND UP		50 MPH TO 59		ICY OR SNOW
	NEAR END		HURRY		60 MPH TO 69		SPEED UNKNOWN
	RAN OFF ROAD		FATALITY		70 AND UP		ONLY



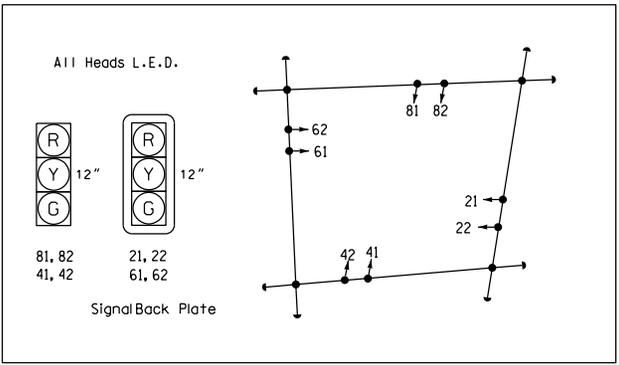
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NC 24/NC 27
 55 MPH
 2014 ADT 17,000

NC 24/NC 27
 55 MPH
 2014 ADT 18,000

SIG ID 10-0974 (2 Phase Fully Actuated)



SR 1125 (Bethel Church Rd)
 45 MPH
 2014 ADT 900

Frontal Impact Crashes

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