

Spot Safety Project Evaluation

Order # 41000023506

Spot Safety Project # 04-06-204

**Spot Safety Project Evaluation of the
Traffic Signal and Left Turn Lane Installation
NC 581 (Arrington Bridge Road) at SR 1919 (Westbrook Road)
City of Goldsboro, Wayne County**

Documents Prepared By:

Safety Evaluation Group
Traffic Safety Systems Management Section
Transportation Mobility and Safety Division
North Carolina Department of Transportation

Principal Investigator



Jason B. Schronce

3-6-2013

Date

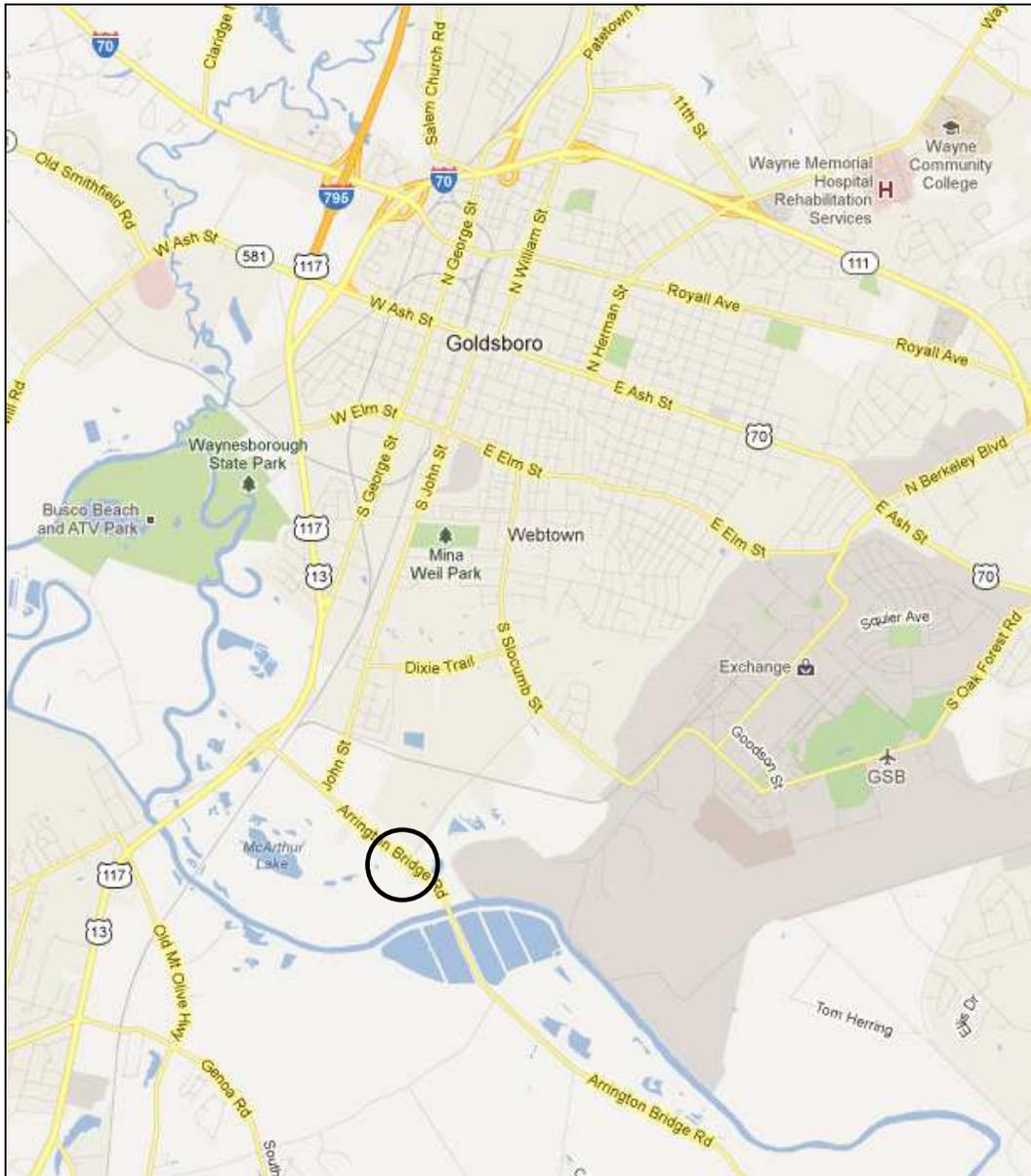
Traffic Safety Project Engineer

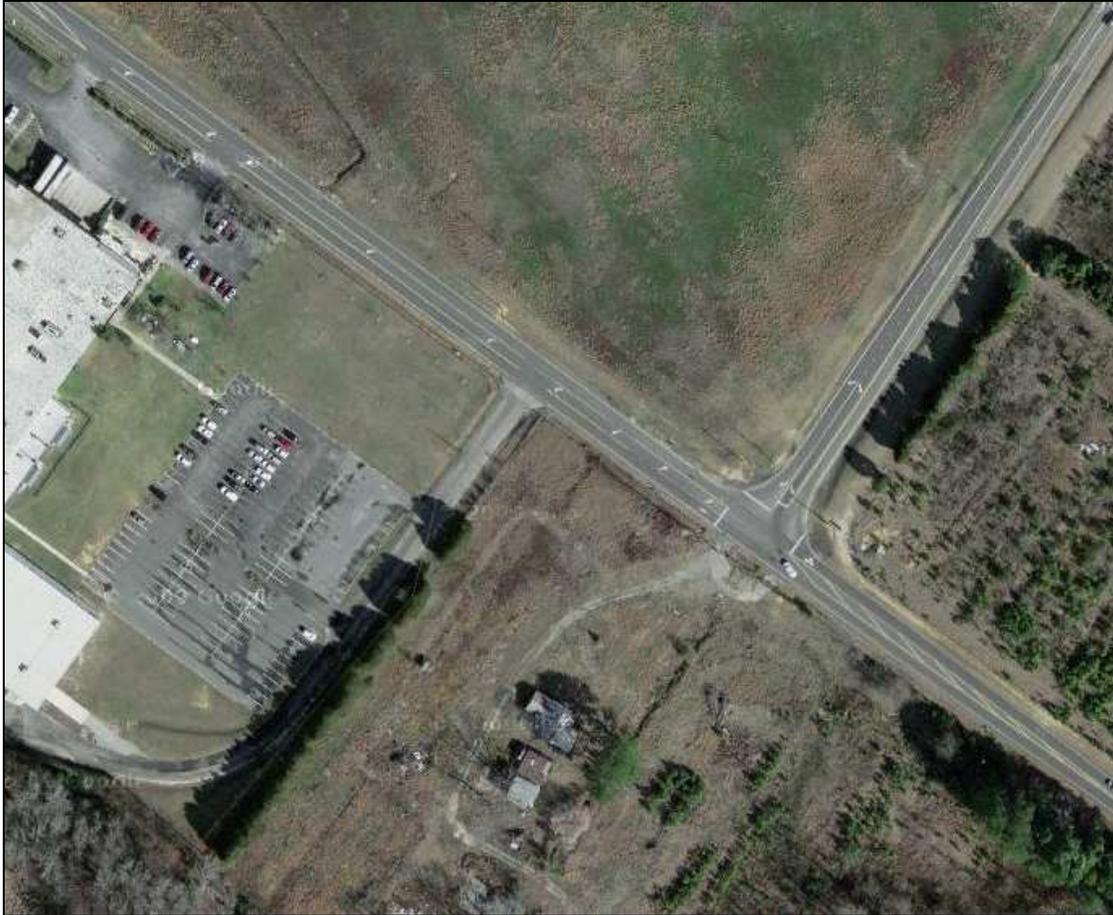
Spot Safety Project Evaluation Documentation

Subject Location

Evaluation of Spot Safety Project Number 04-06-204 located at the Intersection of NC 581 (Arrington Bridge Road), also listed as SR 1915, at SR 1919 (Westbrook Road) in Wayne County, City of Goldsboro.

The Sig ID is 04-1347 for this newly installed traffic signal.





**After Period Aerial Photograph from Google Maps
Shows the Uchiyama America Plant in the Southwest Quadrant**

Project Information and Background from the Project File Folder

The spot safety project improvement countermeasure chosen for the subject location was the installation of an intersection traffic signal with left turn lanes by roadway widening. Left turn lanes were added for the eastbound NC 581 (Arrington Bridge Road) and southbound SR 1919 (Westbrook Road) approaches. The roadway widening also extends approximately 1,000 feet west of the intersection to include a left turn lane for the Uchiyama America industrial plant. Additional funds were potentially used for the extended turn lane addition.

NC 581 and SR 1919 are both two-lane facilities at the subject intersection with speed limits ranging from 45-mph to 55-mph. The subject location is a three-leg intersection, which was formally controlled by dual posted stop signs on SR 1919 (Westbrook Road).

The original statement of problem explained that angle type crashes were occurring due to sight distance restrictions to the east from the stop bar point on SR 1919. The intersection met Traffic Signal Warrants 1A, 2, and 3B.

The initial crash analysis was completed from October 1, 2000 to September 1, 2005 with eleven (11) reported crashes, five (5) of which were deemed correctable frontal impact crashes. The final completion date for the improvement at the subject intersection was on April 9, 2008 with a total cost of \$43,750.

Naive Before and After Analysis

After reviewing the spot safety project file folder along with all the crashes at the subject location, the crash data omitted from this analysis to consider for an adequate construction period were the months of February through April 2008. The before period consisted of reported crashes from June 1, 2003 through January 31, 2008 (4 years and 8 months); and the after period consisted of reported crashes from May 1, 2008 through December 31, 2012 (4 years and 8 months). The ending date for this analysis was determined by the date of available crash data at the time of analysis.

The treatment data consisted of all crashes within 150 feet of the subject intersection. *Please see attached location map, aerial map, and photos for further details.*

The following data table depicts the Naive Before and After Analysis for the treatment location. Please note that Frontal Impact Crashes were the target crashes for the applied traffic signal countermeasure. The Frontal Impact Crash types considered are as follows: Left turn, same roadway; Left turn, different roadways; Right turn, same roadway; Right turn, different roadways; Head on; and Angle. Also, ran through (run-off road straight) crashes were included as target crashes since the motorist disregarded the stop condition / new traffic signal.

<u>Treatment Information</u>	Before	After	Percent Reduction (-) Percent Increase (+)
Total Crashes	14	7	- 50.0 %
Total Severity Index	4.70	3.11	- 33.8 %
Frontal Impact Target Crashes	3	4	33.3 %
Target Crash Severity Index	3.47	2.85	- 17.9 %
Volume (2005, 2010)	9,700	9,900	2.1 %

<u>Injury Crash Summary</u>	Before	After	Percent Reduction (-) Percent Increase (+)
Fatal injury Crashes	0	0	N/A
Class A injury Crashes	0	0	N/A
Class B injury Crashes	1	1	0.0 %
Class C Injury Crashes	6	1	- 83.3 %
Property Damage Only	7	5	- 28.6 %

The naive before and after analysis at the treatment location resulted in a 50 percent reduction in Total Crashes, a 33 percent increase in Frontal Impact Target Crashes, but a 34 percent reduction in the Total Severity Index. The before period ADT year was 2005 and the after period ADT year was 2010.

Results and Discussion

Referencing the *Collision Diagrams*, the before period presented two (2) run through the intersection crashes and one (1) left turn collision. There was also six (6) rear-end crashes within the y-line; three (3) approaching the intersection and three (3) leaving the location heading westbound on NC 581. Two (2) other vehicles also took the right turn onto SR 1919 at an aggressive speed causing one sideswipe and one truck rollover crash.

After the traffic signal installation, there were still two (2) vehicles that ran through the intersection travelling southbound on SR 1919. Additionally, there were two (2) frontal impact left turn target crashes from motorists travelling westbound on NC 581 that ran the red light. However, the rear-end crash pattern from the before period was completely eliminated in the after period.

Please see the attached Treatment Site Photos. Photos are provided from Google Street View for all three approaches to the treatment intersection. As the Safety Evaluation Group completes additional spot safety reviews for this type of countermeasure, we will be able to provide objective and definite information regarding actual crash reduction factors for this type of countermeasure.

Treatment Site Photos (From Google Street View)



Looking South on SR 1919 (Westbrook Road) approaching new signal



Looking East on NC 581 (Arrington Bridge Road)



Looking West on NC 581 (Arrington Bridge Road)

LEGEND

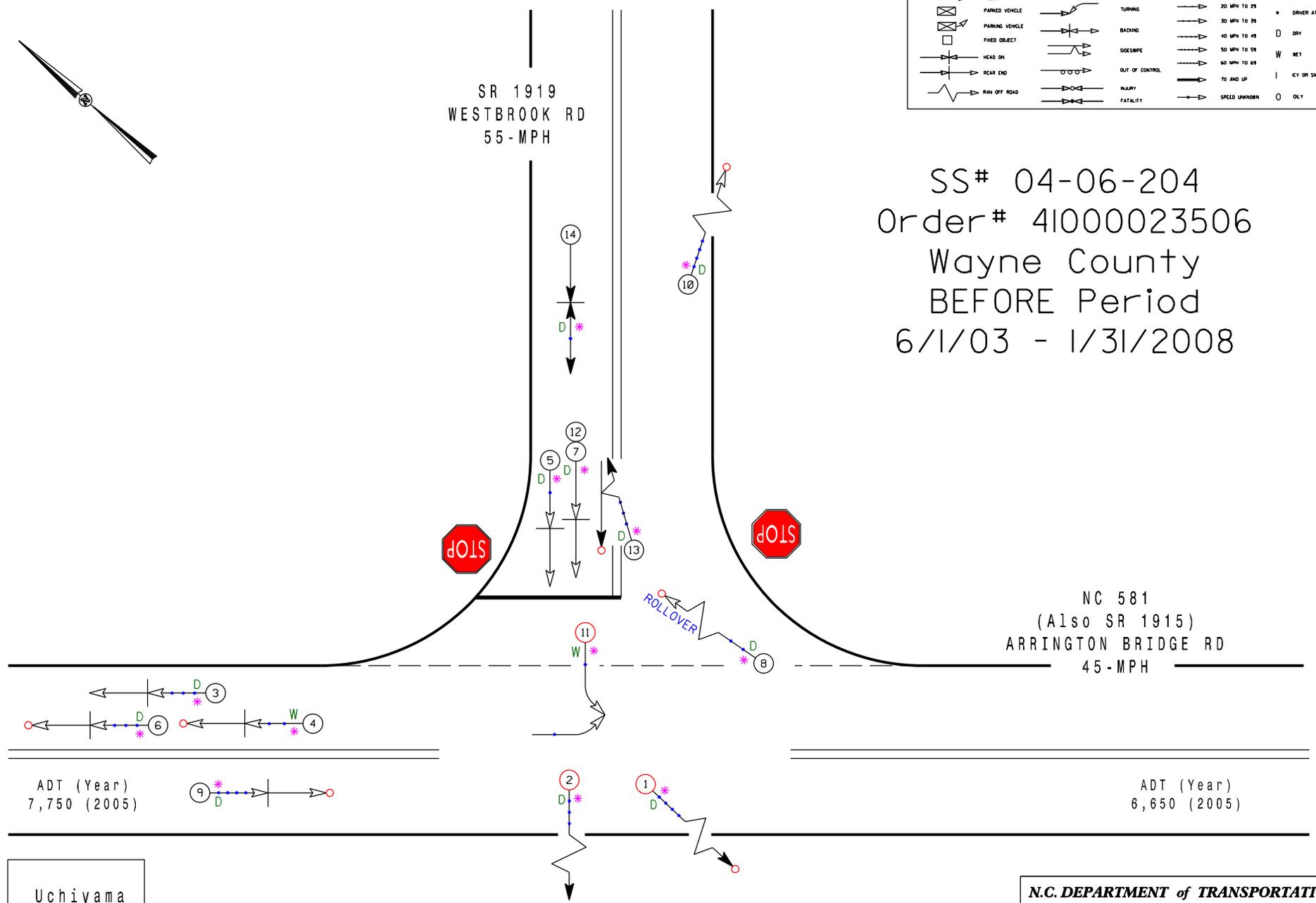
	MOVING VEHICLE		ANGLE		9 MPH OR LESS		PEDESTRIAN
	PEDESTRIAN		TURNING		10 MPH TO 19		TRAIN
	PAKED VEHICLE		BACKING		20 MPH TO 29		DRIVER AT FAULT
	FIXED OBJECT		SIDESWIPE		40 MPH TO 49		DRY
	HEAD ON		OUT OF CONTROL		50 MPH TO 59		WET
	REAR END		REAR END		60 MPH TO 69		ICE OR SNOW
	RAN OFF ROAD		REAR END		TO AND UP		ONLY
			REAR END		SPEED UNKNOWN		
			REAR END				
			REAR END				

ADT (Year)
4,900 (2005)

SR 1919
WESTBROOK RD
55-MPH

SS# 04-06-204
Order# 41000023506
Wayne County
BEFORE Period
6/1/03 - 1/31/2008

NC 581
(Also SR 1915)
ARRINGTON BRIDGE RD
45-MPH



ADT (Year)
7,750 (2005)

ADT (Year)
6,650 (2005)

Uchiyama
America
Plant

Frontal Impact
Target Crashes

N.C. DEPARTMENT of TRANSPORTATION
DIVISION of HIGHWAYS
TRANSPORTATION MOBILITY and
SAFETY DIVISION

TRAFFIC SAFETY UNIT

Date: 2-27-2013

Prepared By: J. Schronce
(Associate Eric Thomas)



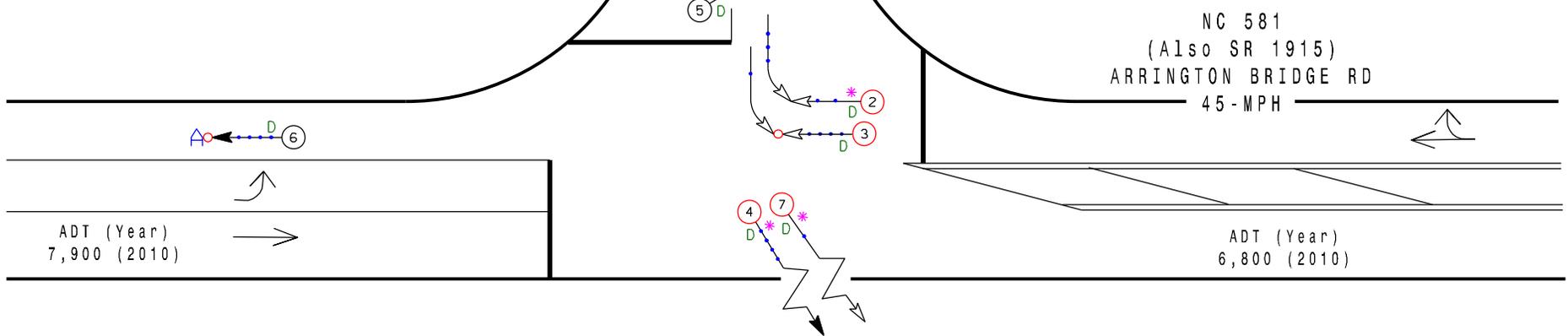
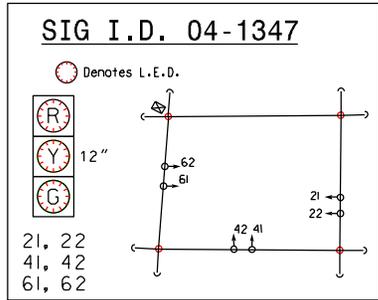
ADT (Year)
5,000 (2010)

SR 1919
WESTBROOK RD
55-MPH

LEGEND

	MOVING VEHICLE		ANGLE		5 MPH OR LESS		PEDESTRIAN
	PEDESTRIAN		TURNING		10 MPH TO 19		TRAIN
	PAKED VEHICLE		BACKING		20 MPH TO 29		DRIVER AT FAULT
	FIXED OBJECT		SIDESWIPE		30 MPH TO 39		DRY
	HEAD ON		OUT OF CONTROL		40 MPH TO 49		WET
	REAR END		BLURRY		50 MPH TO 59		ICY OR SNOWY
	RAN OFF ROAD		FATALITY		60 MPH TO 69		TO AND UP
			SPEED UNKNOWN		ONLY		

SS# 04-06-204
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Wayne County
AFTER Period
5/1/08 - 12/31/12



Uchiyama
America
Plant

Frontal Impact
Target Crashes

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