

# EVALUATION OF HIGH CRASH LOCATIONS (DARK CRITERIA) STUDY



**LOCATION #8:  
US 13 (Sussex Highway)  
MILEPOST 3.10 to 5.29  
November 2012**



**Prepared for:**  
**Delaware Department of Transportation**



**By:**  
**Urban Engineers, Inc.**



## EXECUTIVE SUMMARY

The purpose of this study was to evaluate locations with the highest ratios of crashes occurring during dark conditions throughout the state of Delaware. The study included reviewing crash history and existing conditions of the locations, identifying specific sites where crashes are occurring and providing recommendations to improve conditions.

The Hazard Elimination Program (HEP) site selection process was used to determine ten (10) locations statewide with a dark crashes Critical Ratio greater than one and ten (10) or more crashes occurring in the three year study period within a one-mile roadway segment. US 13 (Sussex Highway, Sussex Road 2), from Milepost 3.10 to 5.29, was determined to be one of the ten locations with the highest dark crashes Critical Ratios statewide.

Police crash reports were analyzed to identify high crash sites along US 13 (Sussex Highway, Sussex Road 2) from Milepost 3.10 to 5.29. Crash clusters were identified at the following three (3) sites:

- Site #1: US 13 (Sussex Highway, Sussex Road 2) @ Mt. Zion Road / Waller Road (Sussex Road 480) Intersection (M.P. 3.40)
- Site #2: US 13 (Sussex Highway, Sussex Road 2) @ Oneals Road / Bethel Concord Road (Sussex Road 485) Intersection (M.P. 4.10)
- Site #3: US 13 (Sussex Highway, Sussex Road 2) @ Airport Road / Ockels Road (Sussex Road 488) Intersection (M.P. 4.90)

Existing roadway lighting is present at none of these sites.

Police crash reports were analyzed to identify high crash sites along US 13 from Milepost 3.10 to 5.29. The crash patterns at one (1) site, US 13 and Oneals Road / Bethel Concord Road (Sussex Road 485) intersection, garnered evaluation for potential nighttime safety improvements. A warrant analysis showed that this intersection did not meet the conditions for installation of roadway lighting.

## Table of Contents

1. INTRODUCTION .....	3
2. CRASH DATA SUMMARY .....	5
3. SITE CHARACTERISTICS .....	7
4. LIGHTING WARRANT EVALUATION .....	9
5. PREVIOUS STUDY RECOMMENDATIONS.....	10
6. RECOMMENDATIONS.....	11

APPENDIX A: Crash Data Summary

APPENDIX B: Crash Diagrams

APPENDIX C: Previous Study

APPENDIX D: Statewide 1.0 Mile Corridors Ranked by Critical Ratio

## 1. INTRODUCTION

The purpose of this study was to evaluate locations with the highest ratios of crashes occurring during dark conditions throughout the state of Delaware. The study included reviewing crash history and existing conditions of the locations, identifying specific sites where crashes are occurring and providing recommendations to improve conditions.

The study included three parts:

**Part 1: Location Selection** – The Hazard Elimination Program (HEP) site selection process was used to determine ten (10) locations statewide with a dark crashes Critical Ratio greater than one and ten (10) or more crashes occurring in the three year study period within a one-mile roadway segment. Results from the location selection process were reviewed in coordination with DelDOT. Corridors that were already part of an ongoing HSIP or HEP project were not included in this study. The Critical Ratio methodology was used in the location selection process. The list of statewide 1.0 mile corridors ranked by Critical Ratio is included in **Appendix D**.

**Part 2: Evaluation** – After the list of the top ten locations was approved by DelDOT, initial review was performed for each selected location. The evaluation included field visits to the sites; collecting information on existing roadway and traffic conditions; crash analysis; preliminary lighting evaluation; and this report. The report includes existing lighting analysis; concept lighting improvement alternatives; other signing, striping and signal recommendations in accordance with the Delaware Strategic Highway Safety Plan (SHSP), particularly related to dark crashes; potential design/implementation issues, and identification of the need for more detailed studies (Phase II studies).

**Part 3: Coordination** –When possible, DelDOT-approved recommendations will be coordinated for inclusion into the construction of ongoing projects. (HEP, Pavement & Rehabilitation, PD, etc.)

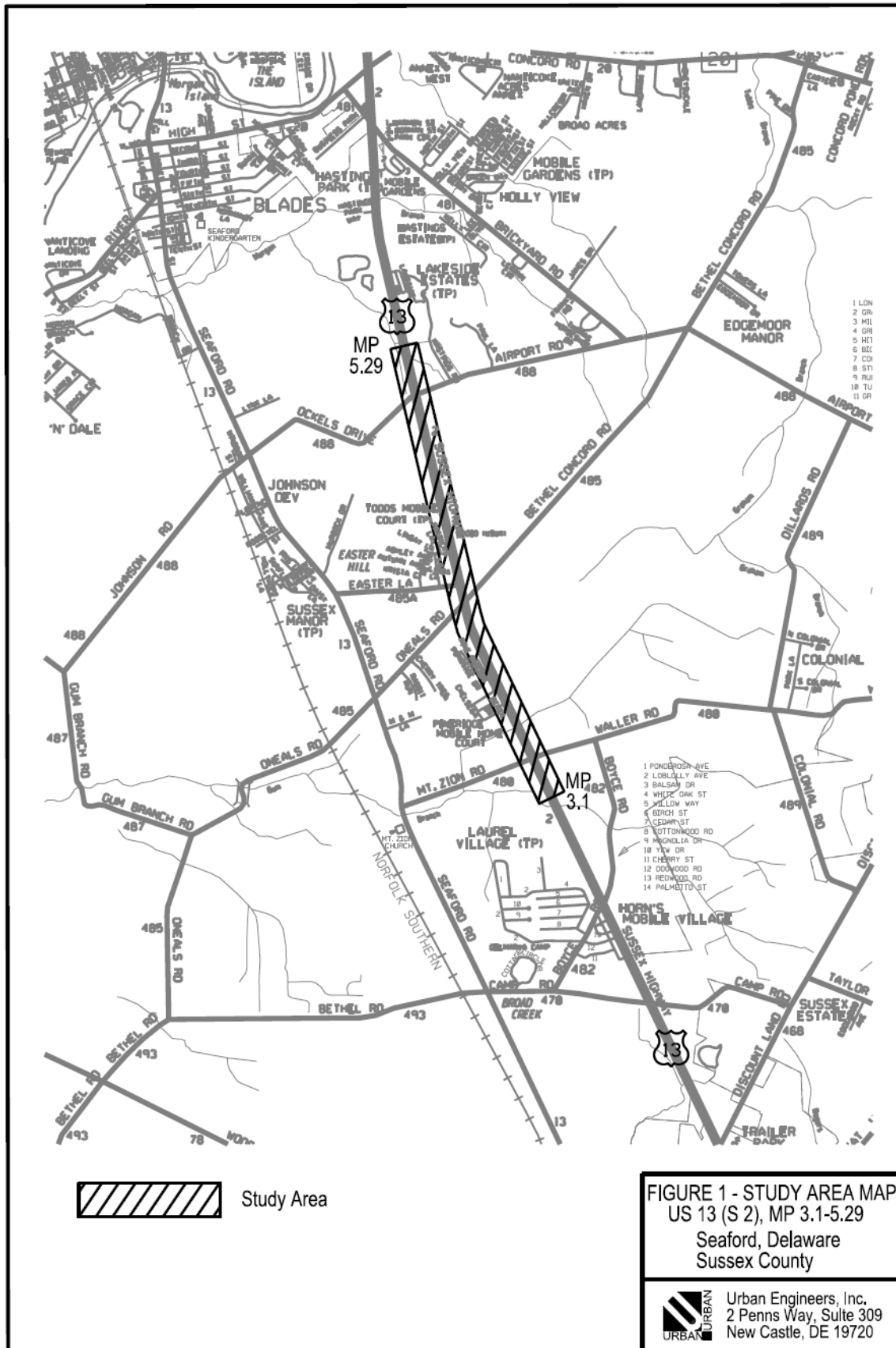
The location selection process resulted in a list of ten locations, including US 13 (Sussex Highway, Sussex Road 2) from milepost 3.10 to 5.29.

### Study Area Characteristics

The study area includes US 13 (Sussex Highway, Sussex Road 2) from milepost 3.10 to 5.29. The study area is in Sussex County, Delaware. US 13 is a four-lane, divided principal arterial roadway throughout the study area.

In 2010, US 13 experienced an ADT of 22,223 vehicles in the study area.

Shoulders are present on both sides of the road in each direction throughout the project area. A study area map is provided in **Figure 1**.



## 2. CRASH DATA SUMMARY

This evaluation was based on crash data during the three year period from May 16, 2008 to May 16, 2011.

A total of 45 crashes occurred on US 13 (Sussex Highway, Sussex Road 2) from milepost 3.10 to 5.29 during the evaluation period.

Eighteen (18) crashes resulted in personal injuries, not including fatality crashes. Two (2) crashes resulted in fatalities. One of the fatal crashes occurred during daylight and the other occurred during dark.

Angle collisions were the most predominant type of impact, with 17 of the 45 crashes (36%).

Of the 45 crashes, 24 of the crashes occurred during daylight (53%). Twenty (20) of the crashes occurred during dark conditions (44%). Nineteen (19) of the dark crashes occurred in dark-not lighted conditions (14%). One (1) of the dark crashes occurred in dark-lighted conditions (2%). One (1) of the crashes occurred in dusk condition (2%).

The highest number of crashes (15) at an individual site occurred at the intersection of US 13 and Oneals Road / Bethel Concord Road.

Crashes were grouped together into sites based on their location along US 13.

*Site #1: US 13 (Sussex Highway, Sussex Road 2) @ Mt. Zion Road / Waller Road (Sussex Road 480) Intersection (M.P. 3.40)*

There were 4 total crashes at the site during the evaluation period. One (1) of the 4 crashes (25%) occurred during dark hours. This site does not have existing roadway lighting.

This site was not selected for evaluation based on the limited crash history during dark hours.

*Site #2: US 13 (Sussex Highway, Sussex Road 2) @ Oneals Road / Bethel Concord Road (Sussex Road 485) Intersection (M.P. 4.10)*

There were 15 total crashes at the site during the evaluation period. Five (5) of the 15 crashes (33%) occurred during dark hours. There was one fatal crash during dark conditions at this intersection. This site does not have existing roadway lighting. **Appendix B** shows the crash diagram for this intersection.

This site was selected for evaluation based on the combination of the crash history and a lack of lighting at the intersection.

Site #3: US 13 (Sussex Highway, Sussex Road 2) @ Airport Road / Ockels Road (Sussex Road 488) Intersection (M.P. 4.90)

There were 8 total crashes at the site during the evaluation period. One (1) of the 8 crashes (13%) occurred during dark hours. This site does not have existing roadway lighting.

This site was not selected for evaluation based on the limited crash history during dark hours.



### 3. SITE CHARACTERISTICS

Site #2: US 13 (Sussex Highway, Sussex Road 2) @ Oneals Road / Bethel Concord Road (Sussex Road 485) Intersection (M.P. 4.10)

US 13 (Sussex Highway, Sussex Road 2) and Oneals Road / Bethel Concord Road (Sussex Road 485) meet at an unsignalized intersection at milepost 4.10 of US 13.

US 13 northbound has two through lanes, a left turn lane and a right turn lane. A painted channelized island is present for the northbound right turn lane. US 13 southbound has two through lanes, a left turn lane and a right turn lane. A raised channelized island is present for the southbound left turn lane. Oneals Road eastbound has a shared left/through/right turn lane. A raised channelized island is present for the eastbound right turn movement. Bethel Concord Road westbound has a shared left/through/right turn lane. A raised channelized island is present for the westbound right turn movement. An aerial showing the intersection layout is shown in **Photo 1**.

There are no pedestrian crosswalks present at the intersection. The posted speed limit for US 13 northbound and US 13 southbound is 55 miles per hour, the posted speed limit for eastbound Oneals Road is 40 miles per hour, and the posted speed limit for westbound Bethel Concord Road is 35 miles per hour.

#### *Existing Lighting*

There is no existing roadway lighting at this intersection.



***Photo 1: US 13 @ Oneals Road / Bethel Concord Road Intersection***

#### 4. LIGHTING WARRANT EVALUATION

The DeIDOT Lighting Guidelines contain the conditions for determining if lighting is warranted at a given site. A warrant analysis is included below for the site that was selected for evaluation.

Site #2: US 13 (Sussex Highway, Sussex Road 2) @ Oneals Road / Bethel Concord Road (Sussex Road 485) Intersection (M.P. 4.10)

Section 2.3, *Lighting Warrants*, of the DeIDOT Lighting Guidelines states that lighting *may* be installed at “locations where crash patterns indicate that lighting may reduce crashes and where the percentage of nighttime accidents is 35 percent or greater.”

##### *Crash Patterns*

The Crash Data Summary and Evaluation showed that there were 15 total crashes near this intersection during the three year evaluation period. Five (5) of these crashes occurred during dark conditions.

The manner of impact of the five (5) dark crashes was as follows:

- 4 Angle
- 1 Run off the road

An examination of the police crash reports showed a predominant number of angle crashes. Of the four (4) angle crashes, three (3) involved the vehicles traveling on the westbound approach to the intersection and one (1) of them was a fatal crash. The last one (1) of the four crashes was run off the road type.

##### *Percentage of Nighttime Crashes*

Thirty-three percent (5 out of 15) of the crashes at the site occurred at the site were during dark conditions.

##### *Lighting Warrant Results*

This site has less than 35% of crashes occurring during dark conditions, therefore it does not meet part of the lighting warrant for a site where roadway lighting *may* be installed.

## 5. PREVIOUS STUDY RECOMMENDATIONS

A previous study was included in a review of previously recommended improvements at the sites.

**2004 HSIP – Site DD Report** included the following recommendations:

<b>IMPLEMENTED</b>	Install a stop line and a double yellow centerline on the eastbound Oneals Road approach to US 13.
<b>IMPLEMENTED</b>	Install a stop line and extend the double yellow centerline on the westbound Bethel-Concord Road approach to US 13.
<b>IMPLEMENTED</b>	Replace the faded “STOP AHEAD” (W3-1a) and the Advance Street Name Plaque (W16-8) located on westbound Bethel-Concord Road approaching US 13.
<b>IMPLEMENTED</b>	Trim the tree branch on westbound Bethel-Concord Road obstructing the “Stop Ahead” sign.
<b>IMPLEMENTED</b>	Replace the “Cross road” (W2-2) signs and Advance Street Name Plaques on northbound and southbound US 13 approaching Bethel-Concord Road with “Cross Road” signs illustrating the skew of the intersection along with Advance Street Name Plaques that display the street name.
<b>IMPLEMENTED</b>	Replace the Bethel-concord Road Road Street Name blade located on the northeast corner of the US 13/Oneals Road/Bethel-Concord Road intersection.

## 6. RECOMMENDATIONS

Site #2: US 13 (Sussex Highway, Sussex Road 2) @ Oneals Road / Bethel Concord Road (Sussex Road 485) Intersection (M.P. 4.10)

### *Roadway Lighting*

There is no existing roadway lighting at this intersection. The crash history at US 13 @ Oneals Road / Bethel Concord Road does not meet DelDOT's conditions for an intersection where lighting may be warranted.

No recommendations are included for this intersection.

### *Ongoing Projects*

Improvements at this intersection have been proposed as part of the US 13 Seaford Intersection Improvements project. Proposed improvements include removal of the northbound left-turn movement and conversion of the side streets to right-out only.

### ***Recommended Improvements***

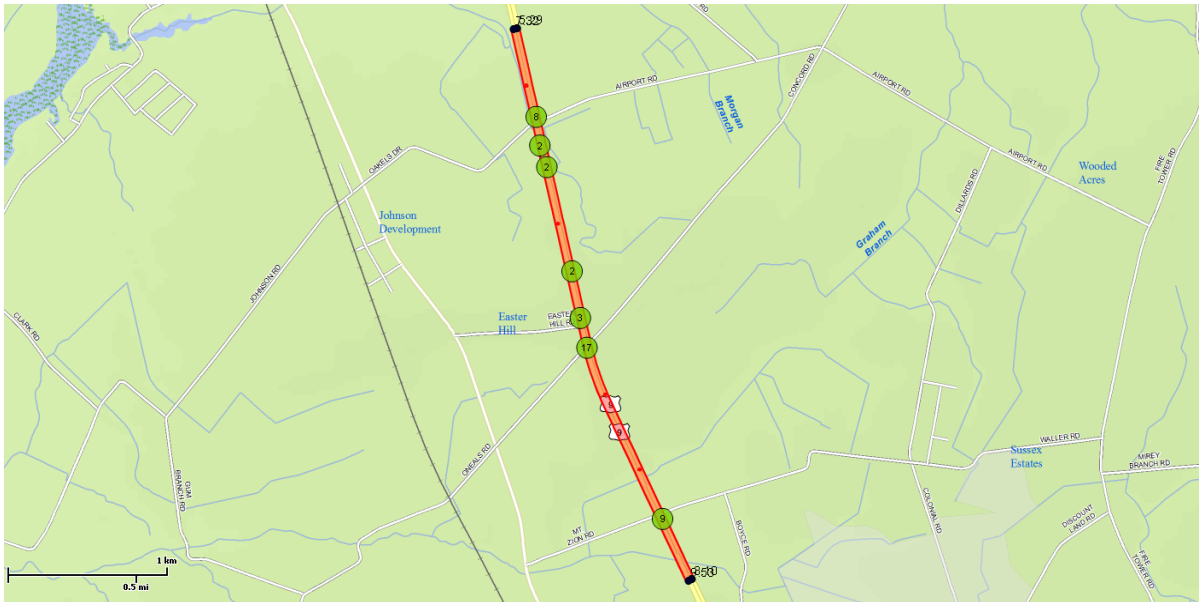
<b>Site</b>	<b>Recommended Improvement</b>
	No recommendations were included

**APPENDIX A: Crash Data Summary**

## Delaware Crash Analysis Reporting System (CARS)

<b>Crash Study Time Period:</b>	<i>Study Period from 05-16-2008 to 05-16-2011</i>
<b>Query Type:</b>	<i>dualHwyBuffer</i>
<b>Description:</b>	<i>S2 US 13 Sussex Highway MP 3.10-5.29</i>

<b>Study Requested By:</b>	LD
<b>Study Generated By:</b>	tdtsswn
<b>Number of Crashes:</b>	47
<b>Includes Non-Reportable Crashes:</b>	N
<b>Study Code:</b>	



*"Disclaimer for CARS: Crash data and associated police reports are intended for DelDOT use only and shall not be transmitted, copied, distributed or provided to any entity other than DelDOT unless written approval is received from the DelDOT Legal Section. Police reports are the property of the Delaware State Police."*

## State of Delaware Crash Study Summary

Study Period from 05-16-2008 to 05-16-2011

Summary		Classification			Manner Of Impact		
	# of Crashes		# of Crashes	% of Total Crashes		# of Crashes	% of Total Crashes
Total Crashes	47	Non-Reportable	0	0.00%	Front to rear	7	14.89%
Fatal Crashes	2				Front to front	1	2.13%
Total Alcohol-Related Crashes	4		27	57.45%	Angle	17	36.17%
Total Non Alcohol-Related Crashes	43		18	38.30%	Sideswipe, same direction	1	2.13%
Total Fatalities	2		2	4.26%	Sideswipe, opposite direction	2	4.26%
Total Pedestrian Fatalities	0	Total			47		
Total Pedestrian Injuries	0				Rear to side	1	2.13%
Total Pedestrian Crashes	0				Rear to rear	1	2.13%
Total Motorcycle Crashes	1				Other	3	6.38%
Total Pedalcyclist Crashes	0				Unknown	2	4.26%
					Not a collision between two vehicles	12	25.53%
					Total	47	

Alcohol Related Crashes by Classification					
	Non-reportable	Reportable	Personal Injury	Fatality	Total
Alcohol Related	0	1	3	0	4
Non-Alcohol Related	0	26	15	2	43
Total	0	27	18	2	47

Manner of Impact By Classification					
	Non-Reportable	Reportable	Personal Injury	Fatality	Total
Front to rear	0	3	4	0	7
Front to front	0	1	0	0	1
Angle	0	7	8	2	17
Sideswipe, same direction	0	0	1	0	1
Sideswipe, opposite direction	0	2	0	0	2
Rear to side	0	0	1	0	1
Rear to rear	0	1	0	0	1
Other	0	2	1	0	3
Unknown	0	2	0	0	2
Not a collision between two vehicles	0	9	3	0	12
Total	0	27	18	2	47

*"Disclaimer for CARS: Crash data and associated police reports are intended for DelDOT use only and shall not be transmitted, copied, distributed or provided to any entity other than DelDOT unless written approval is received from the DelDOT Legal Section. Police reports are the property of the Delaware State Police."*



Day Of Week		
	# of Crashes	% of Total Crashes
Sunday	5	10.64%
Monday	9	19.15%
Tuesday	2	4.26%
Wednesday	9	19.15%
Thursday	6	12.77%
Friday	6	12.77%
Saturday	10	21.28%
<b>Total</b>	<b>47</b>	

Time Of Day (AM)		
	# of Crashes	% of Total Crashes
00:00 - 00:59	0	0.00%
01:00 - 01:59	4	8.51%
02:00 - 02:59	0	0.00%
03:00 - 03:59	0	0.00%
04:00 - 04:59	1	2.13%
05:00 - 05:59	2	4.26%
06:00 - 06:59	1	2.13%
07:00 - 07:59	1	2.13%
08:00 - 08:59	0	0.00%
09:00 - 09:59	0	0.00%
10:00 - 10:59	2	4.26%
11:00 - 11:59	1	2.13%
<b>Total</b>	<b>12</b>	

Time Of Day (PM)		
	# of Crashes	% of Total Crashes
12:00 - 12:59	5	10.64%
13:00 - 13:59	2	4.26%
14:00 - 14:59	1	2.13%
15:00 - 15:59	4	8.51%
16:00 - 16:59	6	12.77%
17:00 - 17:59	4	8.51%
18:00 - 18:59	2	4.26%
19:00 - 19:59	2	4.26%
20:00 - 20:59	1	2.13%
21:00 - 21:59	3	6.38%
22:00 - 22:59	3	6.38%
23:00 - 23:59	2	4.26%
<b>Total</b>	<b>35</b>	
Unknown Time	0	

Surface Conditions		
	# of Crashes	% of Total Crashes
Dry	35	74.47%
Wet	9	19.15%
Snow	2	4.26%
Ice/Frost	1	2.13%
Sand	0	0.00%
Water (standing,mo'	0	0.00%
Slush	0	0.00%
Oil	0	0.00%
Mud, Dirt, Gravel	0	0.00%
Other	0	0.00%
Unknown	0	0.00%
<b>Total</b>	<b>47</b>	

Lighting Conditions		
	# of Crashes	% of Total Crashes
Daylight	25	53.19%
Dawn	0	0.00%
Dusk	1	2.13%
Dark-Lighted	1	2.13%
Dark-Not Lighted	20	42.55%
Dark-Unknown Lighting	0	0.00%
Other	0	0.00%
Unknown	0	0.00%
<b>Total</b>	<b>47</b>	

Weather Conditions		
	# of Crashes	% of Total Crashes
Clear	32	68.09%
Cloudy	3	6.38%
Fog, Smog, Smoke	1	2.13%
Rain	8	17.02%
Sleet, Hail (freezing rain or drizzle)	0	0.00%
Snow	3	6.38%
Blowing Snow	1	2.13%
Severe Crosswinds	0	0.00%
Blowing Sand, Soil, Dirt	0	0.00%
Other	0	0.00%
Unknown	0	0.00%
<b>Total</b>	<b>48</b>	

"Disclaimer for CARS: Crash data and associated police reports are intended for DelDOT use only and shall not be transmitted, copied, distributed or provided to any entity other than DelDOT unless written approval is received from the DelDOT Legal Section. Police reports are the property of the Delaware State Police."

First Harmful Event		
	# of Crashes	% of Total Crashes
Overturn/Rollover, Non-Collision	0	0.00%
Fire/Explosion, Non-Collision	0	0.00%
Immersion, Non-Collision	0	0.00%
Jackknife, Non-Collision	0	0.00%
Cargo/Equipment Loss or Shift, Non-Collision	0	0.00%
Fell/Jumped From Motor Vehicle, Non-Collision	0	0.00%
Thrown or Falling Object, Non-Collision	0	0.00%
Other Non-Collision, Non-Collision	2	4.26%
Pedestrian, Collision With Person, Motor Vehicle, or Non-Fixed Object	0	0.00%
Pedalcycle, Collision With Person, Motor Vehicle, or Non-Fixed Object	1	2.13%
Railway Vehicle (train, engine), Collision With Person, Motor Vehicle, or Non-Fixed Object	0	0.00%
Animal, Collision With Person, Motor Vehicle, or Non-Fixed Object	10	21.28%
Motor Vehicle in Transport, Collision With Person, Motor Vehicle, or Non-Fixed Object	28	59.57%
Legally Parked Motor Vehicle, Collision With Person, Motor Vehicle, or Non-Fixed Object	0	0.00%
Struck by Falling, Shifting Cargo or Anything Set in Motion by Motor Vehicle, Collision With Person, Motor Vehicle, or Non-Fixed Object	0	0.00%
Work Zone / Maintenance Equipment, Collision With Person, Motor Vehicle, or Non-Fixed Object	0	0.00%
Other Non-Fixed Object, Collision With Person, Motor Vehicle, or Non-Fixed Object	1	2.13%
Impact Attenuator/Crash Cushion, Collision With Fixed Object	0	0.00%
Bridge Overhead Structure, Collision With Fixed Object	0	0.00%
Bridge Pier or Support, Collision With Fixed Object	0	0.00%
Bridge Rail, Collision With Fixed Object	0	0.00%
Cable Barrier, Collision With Fixed Object	0	0.00%
Culvert, Collision With Fixed Object	0	0.00%
Curb, Collision With Fixed Object	0	0.00%
Ditch, Collision With Fixed Object	0	0.00%
Embankment, Collision With Fixed Object	4	8.51%

*"Disclaimer for CARS: Crash data and associated police reports are intended for DelDOT use only and shall not be transmitted, copied, distributed or provided to any entity other than DelDOT unless written approval is received from the DelDOT Legal Section. Police reports are the property of the Delaware State Police."*

Guardrail Face, Collision With Fixed Object	0	0.00%
Guardrail End, Collision With Fixed Object	0	0.00%
Concrete Traffic Barrier, Collision With Fixed Object	0	0.00%
Other Traffic Barrier, Collision With Fixed Object	0	0.00%
Tree (standing), Collision With Fixed Object	0	0.00%
Utility Pole, Collision With Fixed Object	0	0.00%
Light Support, Collision With Fixed Object	0	0.00%
Traffic Sign Support, Collision With Fixed Object	1	2.13%
Overhead Sign Support, Collision With Fixed Object	0	0.00%
Traffic Signal Support, Collision With Fixed Object	0	0.00%
Fence, Collision With Fixed Object	0	0.00%
Mailbox, Collision With Fixed Object	0	0.00%
Other Post, Pole or Support, Collision With Fixed Object	0	0.00%
Other Fixed Object (wall, building, tunnel, etc.), Collision With Fixed Object	0	0.00%
Illegally Parked Motor Vehicle, Collision with person, vehicle, or object not fixed	0	0.00%
Stopped Motor Vehicle, Collision with person, vehicle, or object not fixed	0	0.00%
Unknown, Collision With Fixed Object	0	0.00%
<b>Total</b>	<b>47</b>	

*"Disclaimer for CARS: Crash data and associated police reports are intended for DelDOT use only and shall not be transmitted, copied, distributed or provided to any entity other than DelDOT unless written approval is received from the DelDOT Legal Section. Police reports are the property of the Delaware State Police."*

Primary Contributing Circumstance		
	# of Crashes	% of Total Crashes
Speeding	0	0.00%
Failed to yield right of way	7	14.89%
Passed Stop Sign	1	2.13%
Disregard Traffic Signal	1	2.13%
Wrong side or wrong way	0	0.00%
Improper passing	0	0.00%
Improper lane change	0	0.00%
Following too close	0	0.00%
Made improper turn	0	0.00%
Driving under the influence	0	0.00%
Driver inattention, distraction, or fatigue	2	4.26%
Driving in a careless or reckless manner	2	4.26%
Driving in an aggressive manner	0	0.00%
Improper backing	0	0.00%
Other improper driving	0	0.00%
Mechanical defects	0	0.00%
Animal in Roadway - Deer	2	4.26%
Animal in Roadway - Other Animal	0	0.00%
Other environmental circumstances - weather, glare	3	6.38%
Roadway circumstances - debris, holes, work zone	0	0.00%
Other	0	0.00%
Unknown	1	2.13%
<b>Total</b>	<b>19</b>	

*"Disclaimer for CARS: Crash data and associated police reports are intended for DelDOT use only and shall not be transmitted, copied, distributed or provided to any entity other than DelDOT unless written approval is received from the DelDOT Legal Section. Police reports are the property of the Delaware State Police."*

Driver Contributing Circumstance		
	# of Drivers	% of Total Drivers
No Contributing Action		0.00%
Failed to yield right of way		36.84%
Ran Red Light		5.26%
Ran Stop Sign		5.26%
Disregard other traffic sign		0.00%
Disregard other road markings		0.00%
Exceeded authorized speed limit		0.00%
Driving too fast for conditions		0.00%
Made an improper turn		0.00%
Improper backing		0.00%
Wrong side or wrong way		10.53%
Followed too closely		10.53%
Failure to keep in proper lane		0.00%
Ran off roadway		0.00%
Operating vehicle in erratic, reckless, careless, negligent or aggressive manner		0.00%
Swerving or avoiding due to wind, slippery surface, vehicle, object, non-motorist in roadway, etc.		0.00%
Over-correcting/over-steering		10.53%
Improper Passing		0.00%
Other Contributing Action		15.79%
Unknown		5.26%
<b>Total</b>		

*"Disclaimer for CARS: Crash data and associated police reports are intended for DelDOT use only and shall not be transmitted, copied, distributed or provided to any entity other than DelDOT unless written approval is received from the DelDOT Legal Section. Police reports are the property of the Delaware State Police."*

CTY	RD	MP	C-MP	DIR	COMP/HQ#	Date	Time	Day	Fat	Inj	AL	LC	WC	SC	FHE	PC	Class	MOI
-----	----	----	------	-----	----------	------	------	-----	-----	-----	----	----	----	----	-----	----	-------	-----

## 2008

S	2	2.29	8.61	2	0508027469	6/15/08	1300	1	0	0	N	01	02	01	13		03	04
S	2	2.24	8.56	2	0508027556	6/15/08	2245	1	0	0	N	05	01	01	13		03	03
S	485	2.3	2.3	5	0508031331	7/4/08	2230	6	0	0	Y	05	04	02	13		02	05
S	2	2.29	8.61	2	0508026310	6/9/08	1705	2	0	0	N	01	01	01	26		03	00
S	2	4.34	4.34	1	0508052978	10/29/08	2110	4	0	0	N	05	01	01	12		02	00
S	485	2.27	2.27	5	0508044195	9/7/08	1650	1	0	0	N	01	01	01	13		02	05
S	2	1.32	7.64	2	0508059113	12/7/08	0140	1	0	0	N	05	04	02	12		02	99
S	2	2.24	8.56	2	0508051152	10/18/08	1850	7	1	0	N	05	01	01	13	02	04	03
S	488	1.98	1.98	5	0508056520	11/20/08	1615	5	0	0	N	01	01	01	13		03	03
S	2	2.24	8.56	2	0508060022	12/12/08	1021	6	0	0	N	01	01	01	26		03	00
S	2	4.93	4.93	1	0508062994	12/31/08	1120	4	0	0	N	01	01	01	12		02	00
S	2	2.24	8.56	2	0508042908	8/31/08	1710	1	0	0	N	01	01	01	13		02	03
S	2	2.24	8.56	2	0508056774	11/22/08	0755	7	0	0	N	01	01	01	13		02	03
S	2	2.24	8.56	2	0508047473	9/26/08	1714	6	0	0	N	01	01	01	13		02	03

## 2009

S	2	1.22	7.54	2	0509040126	8/12/09	1523	4	0	0	N	01	01	01	13		02	00
S	2	3.37	3.37	5	0509035852	7/22/09	1254	4	0	2	N	01	01	01	13	02	03	03
S	2	3.31	3.31	1	0509022587	5/18/09	1438	2	0	0	N	01	01	01	17		02	00
S	2	1.46	7.78	2	0509022227	5/16/09	1558	7	0	0	Y	01	01	01	13		03	01
S	2	5	5	1	0509055030	11/2/09	0113	2	0	0	N	05	02	01	12		02	00
S	2	4.05	4.05	1	0509053900	10/26/09	1605	2	0	0	N	01	01	01	13		02	01
S	2	4.75	4.75	1	0509064310	12/26/09	0101	7	0	0	N	05	04	02	12		02	00
S	2	2.09	8.41	2	0509047927	9/21/09	1949	2	0	0	N	05	01	01	08		02	00
S	2	3.34	3.34	1	0509054140	10/28/09	0655	4	0	0	N	03	04	02	13		03	01
S	2	3.34	3.34	1	0509053246	10/23/09	0510	6	0	0	N	05	01	01	12		02	99
S	2	3.85	3.85	1	0509029093	6/20/09	0159	7	0	0	N	05	01	01	12		02	00
S	488	2	2	5	0508008517	2/24/09	1535	3	0	0	N	01	01	01	13		02	03
S	480	0.56	0.56	5	0509022606	5/18/09	1641	2	1	2	N	01	01	01	13	03	04	03
S	480	0.54	0.54	5	0509025515	6/1/09	1225	2	0	3	N	01	01	01	13	02	03	03
S	2	4.39	4.39	1	0509013811	3/28/09	0400	7	0	2	Y	05	04	02	13		03	01
S	2	4.98	4.98	1	0509049859	10/3/09	1346	7	0	0	N	01	01	01	13		02	07
S	2	3.32	3.32	1	0509058314	11/20/09	1727	6	0	0	N	04	01	01	12		02	00
S	2	4.01	4.01	1	0509060321	12/2/09	2140	4	0	0	N	05	04	02	26		03	00
S	00002	4.12			0509065276	12/31/09	1958	5	0	0	N	05	03 - 04	02	10	99	02	01

## 2010

S	00002	3.4			0510004861	1/30/10	1835	7	0	0	N	05	07 -	03	13	19	02	01
S	00002	2.12			0510005317	2/2/10	2115	3	0	2	Y	05	06 -	02	13	12	03	01
S	00485	2.28	2.28	2	0510066801	12/29/10	1036	4	0	0	N	01	01 -	02	13	12	02	03
S	00002	1.44	7.76	2	0510049056	9/18/10	0504	7	0	0	N	05	01 -	01	26	11	02	88
S	00485	2.28	2.28	3	0510037266	7/22/10	1540	5	0	1	N	01	01 -	01	13	04	03	03

"Disclaimer for CARS: Crash data and associated police reports are intended for DelDOT use only and shall not be transmitted, copied, distributed or provided to any entity other than DelDOT unless written approval is received from the DelDOT Legal Section. Police reports are the property of the Delaware State Police."

CTY	RD	MP	C-MP	DIR	COMP/HQ#	Date	Time	Day	Fat	Inj	AL	LC	WC	SC	FHE	PC	Class	MOI
-----	----	----	------	-----	----------	------	------	-----	-----	-----	----	----	----	----	-----	----	-------	-----

## 2010

S	00002	1.75	8.07	2	0510049116	9/18/10	1238	7	0	1	N	01	01 -	01	08	02	03	88
S	00002	4.06	4.06	1	0510028032	6/9/10	1622	4	0	1	N	01	02 - 02	01	13	02	03	03
S	00002	3.54	3.54	1	0510038247	7/26/10	2233	2	0	0	N	05	01 -	01	12	17	02	02
S	00002	2.99	9.31	2	0510057657	11/3/10	2355	4	0	0	N	05	04 -	01	12	17	02	88
S	00485	2.28	2.28	3	0510064636	12/16/10	1226	5	0	0	N	01	06 -	03	34	19	02	03
S	00002	1.52	7.84	2	0510066527	12/27/10	2055	2	0	2	N	05	06 -	04	13	19	03	06

## 2011

S	00002	4.94	4.94	1	0511016326	4/14/11	1203	5	0	2	N	01	01 -	01	13	02	03	03
S	00002	4.94	4.94	1	0511021035	5/12/11	1631	5	0	3	N	01	01 -	01	13	02	03	03
S	00485	2.3	2.30	1	0511014303	4/1/11	2356	6	0	0	N	05	01 -	01	13	11	02	03

Report generated by tdtsswn at 2011-05-23 12:30:47.888

### Report Legend

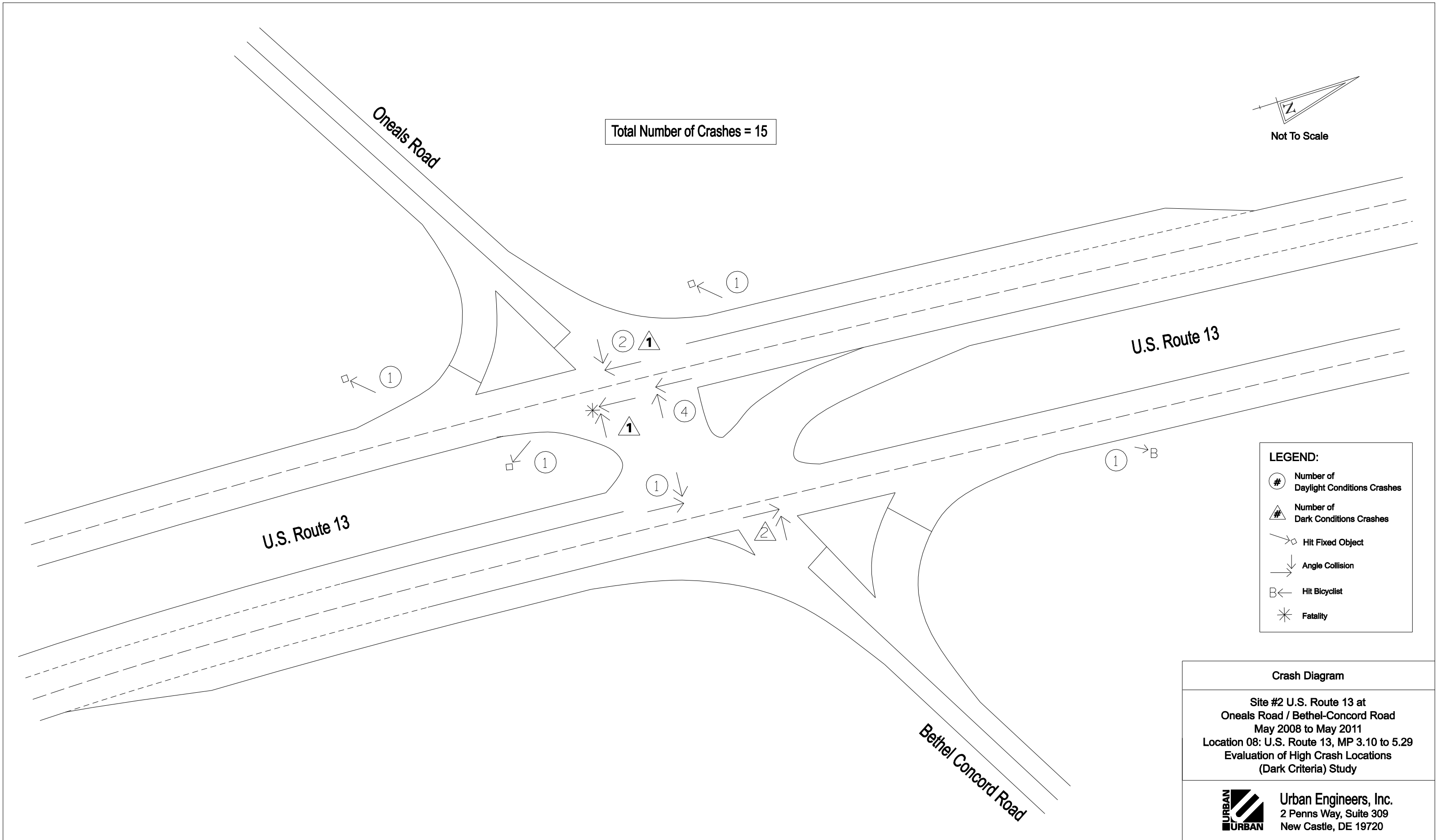
**Cty - County**  
**Rd - Maintenance Road**  
**MP - Milepoint**  
**C-MP - Continuous Milepoint**  
**Dir - Direction of Highway**  
**COMP/HQ# - Complaint Number/Headquarters Number**  
**DAY - Day Of Week Code**  
**Fat - Fatality**  
**Inj - Injury**  
**AL - Alcohol Involved**  
**LC - Lighting Condition**  
**WC - Weather Condition**  
**SC - Surface Condition**  
**MHE - Most Harmful Event**  
**PC - Primary Contributing Circumstance**  
**Class - Report Classification**  
**MOI - Manner of Impact**

"Disclaimer for CARS: Crash data and associated police reports are intended for DelDOT use only and shall not be transmitted, copied, distributed or provided to any entity other than DelDOT unless written approval is received from the DelDOT Legal Section. Police reports are the property of the Delaware State Police."

## **APPENDIX B: Crash Diagram**

*Site #2: US 13 (Sussex Highway, Sussex Road 2) @ Oneals Road / Bethel Concord Road (Sussex Road 485) Intersection (M.P. 4.10)*





## **APPENDIX C: Previous Study**

*2004 HSIP – Site DD Report*

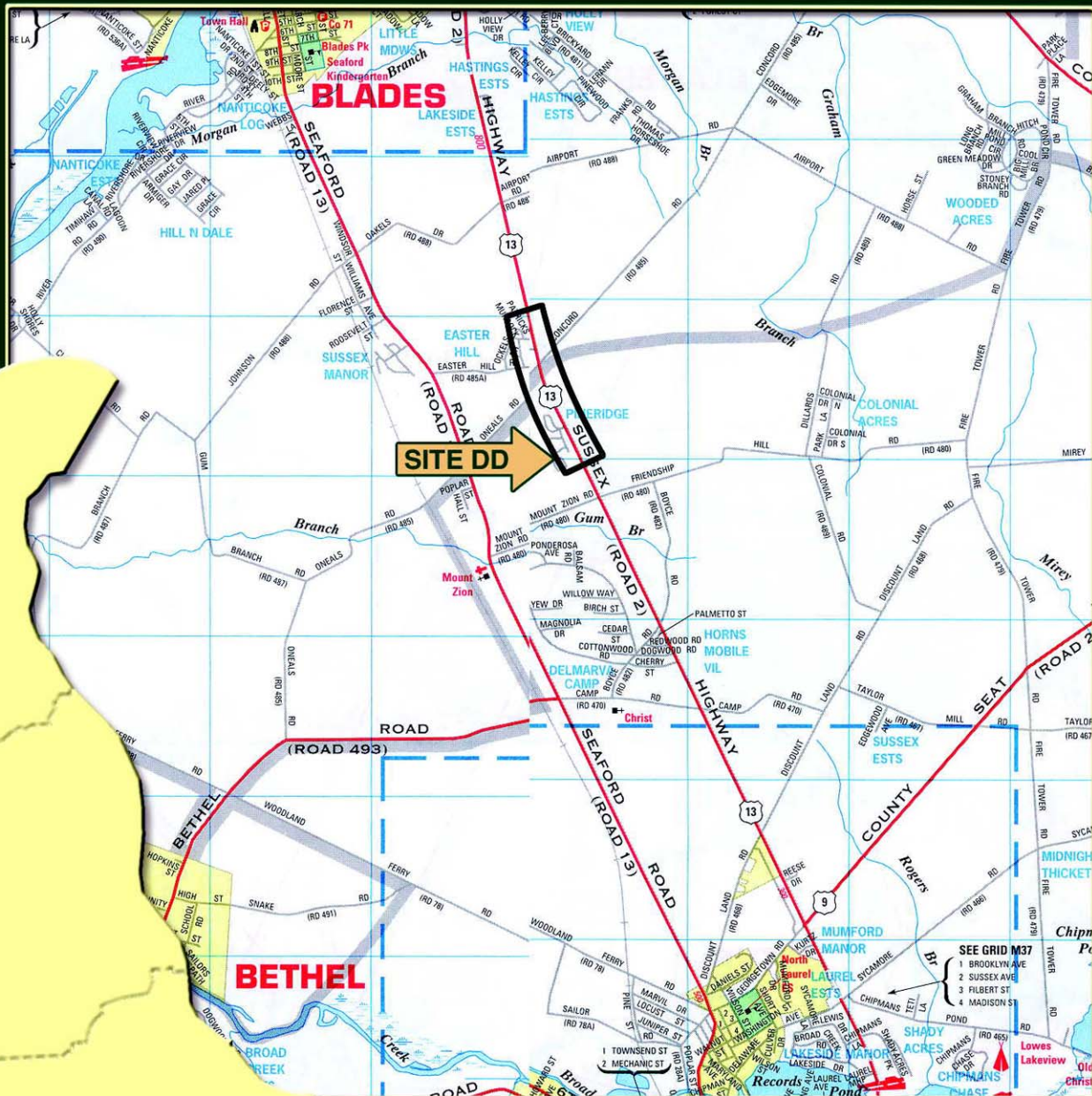
# 2004 Highway Safety Improvement Program - SITE DD

S2 (US 13) - MP 3.6 - 4.49

From 0.23 miles north of Road 480 to 0.34 miles north of Road 485A



SITE DD



DD

2004

WR&A

Whitman, Requardt and Associates, LLP  
801 South Caroline Street, Baltimore, MD 21231

## INTRODUCTION

Site DD is a 0.89-mile corridor located south of Seaford along U.S. 13 from 0.23-miles north of Road 480/Mount Zion Road/Friendship Hill Road to 0.34 miles north of Road 485A/Easter Hill Road. US 13 is a four-lane, divided, open-section roadway with shoulders. The posted speed limit is 55 miles per hour throughout the corridor. The ADT is approximately 26,500. Within the limits of the site, there is one unsignalized intersection at Bethel-Concord Road/Oneals Road/Road 485.

**Other Relevant Projects:** U.S. 13 within the limits of the site is included in the Corridor Capacity Preservation Program. This Program seeks to preserve capacity along U.S. 13 and reduce the number of traffic signals and intersections that slow through traffic. No specific improvements are proposed within the limits of the HSIP site.

## ACCIDENT DATA SUMMARIES

A total of 26 accidents were reported during the three-year study period between January 2000 and December 2002 including 13 (50 percent) angle accidents and 6 (23 percent) rear end accidents. Of the six rear end accidents, two involved vehicles stopped behind a school bus. Seventeen (65%) of the accidents occurred at the US 13 at Concord Road intersection. Many of the angle accidents involved westbound motorists who did not stop in the median prior to crossing U.S. 13 and were then struck by southbound through vehicles, but the motorist's intended direction is unclear due to the divided highway. The following is a summary of the accidents by location and type:

- US 13/Bethel-Concord Road - 17 accidents
  - 5 southbound/westbound angle accidents (one fatality)
  - 4 southbound rear end accidents
  - 2 northbound/eastbound angle accident
  - 2 northbound left-turn accidents
  - 1 southbound/eastbound angle accident
  - 1 northbound/westbound angle accident
  - 1 southbound left-turn accident
  - 1 eastbound right-turn/southbound angle accident

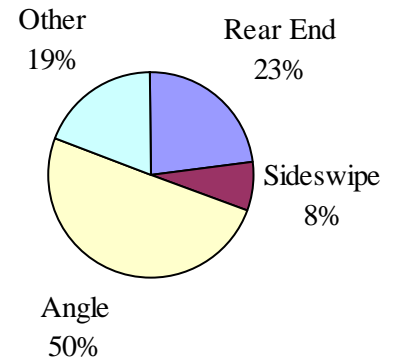
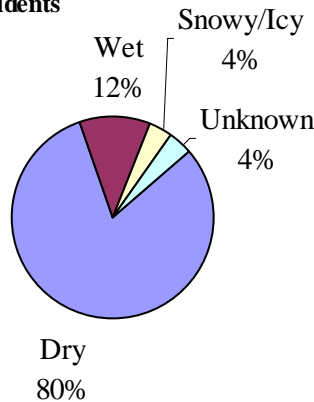
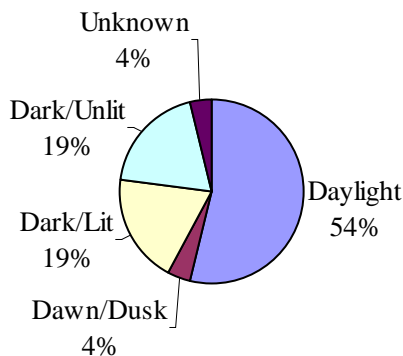
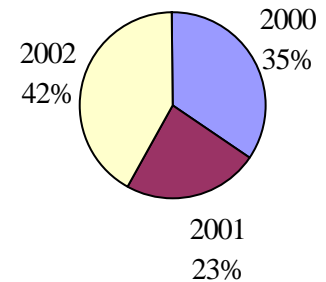
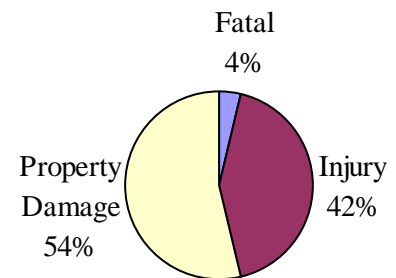
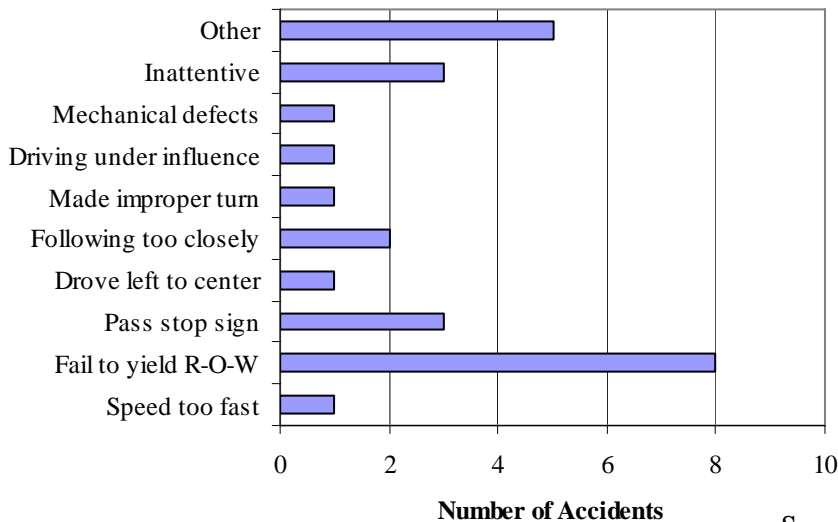
A categorical summary of the accidents by type, severity, surface condition, lighting condition, year, and primary cause is shown in Table 1.

## FIELD OBSERVATIONS

### U.S. 13/Oneals Road/Bethel-Concord Road

- Oneals Road/Bethel-Concord Road intersects U.S. 13 at a skew. This intersection operates under stop control on the eastbound and westbound approaches. Both the eastbound and the westbound Oneals Road/Bethel-Concord Road approaches have channelized right-turns and a shared left-turn/through lane. Southbound left-turning vehicles are channelized by a concrete island.
- YIELD signs are located in the median opening for westbound traffic and northbound and southbound left-turning traffic. The median can only accommodate a single eastbound or westbound vehicle in each direction at one time. For example, if several westbound vehicles try to squeeze into the median together to reduce the delay at Bethel-Concord Road but then the rear vehicle juts into northbound traffic.

**TABLE 1**  
**Accident Data Summary**



- The “STOP AHEAD” warning sign located on the westbound approach to U.S. 13 is faded and obstructed by tree branches.
- The Bethel-Concord Road Street Name blade on the northeast corner of the intersection is damaged.
- Westbound motorists were observed looking far over their right shoulder while waiting in the median opening to locate an adequate gap on southbound U.S. 13. Several motorists were observed completing either a through or left-turn movement without stopping.
- While the Ford dealership on the southeast corner may provide some ambient light, there is no street lighting provided along the U.S. 13 corridor.
- During the AM peak, heavy volumes exiting the Easter Hill Road intersection located just north of the Oneals Road intersection may have delayed eastbound and westbound vehicles at the Oneals Road/Bethel-Concord Road intersection. Aggressive drivers at the southern intersection who have been delayed may not wait for an appropriate gap in traffic creating a potential safety problem.
- Eastbound and westbound Oneals Road/Bethel-Concord Road queues were minimal during peak hours.

- Eastbound and westbound right turns operate under “Stop” control.

### ***REMEDIAL IMPROVEMENTS***

- Install a stop line and a double yellow centerline on the eastbound Oneals Road approach to U.S. 13.
- Install a stop line and extend the double yellow centerline on the westbound Bethel-Concord Road approach to U.S. 13.
- Replace the faded “STOP AHEAD” (W3-1a) and the Advance Street Name Plaque (W16-8) located on westbound Bethel-Concord Road approaching U.S. 13.
- Trim the tree branch on westbound Bethel-Concord Road obstructing the “Stop Ahead” sign.
- Replace the “Cross Road” (W2-2) signs and Advance Street Name Plaques on northbound and southbound U.S. 13 approaching Bethel-Concord Road with “Cross Road” signs illustrating the skew of the intersection along with Advance Street Names Plaques that display the street name.
- Replace the Bethel-Concord Road Street Name blade located on the northeast corner of the U.S. 13/Oneals Road/Bethel-Concord Road intersection.

### ***TASK 1A STUDIES***

The HSIP committee recommends performing turning movement counts and conflict analyses at the U.S. 13 at Oneals Road/Bethel-Concord Road intersection to determine the need for and impacts associated with intersection channelization to prohibit specific turning movements and reduce conflict points at the intersection.

### ***TOTAL COST OF REMEDIAL IMPROVEMENTS - \$1000***



In-House Working Document (Not for external distribution)



Northbound U.S. 13 at Oneals  
Road/Bethel Concord Road



Southbound U.S. 13 at Oneals  
Road/Bethel Concord Road



Eastbound Oneals Road approaching  
U.S. 13



Westbound Bethel Concord Road at U.S.  
13

## **APPENDIX D: Statewide 1.0 Mile Corridors Ranked by Critical Ratio**



**Delaware - Statewide**  
**Accident Date Range**  
01/01/2007 - 12/31/2009

**Interval Length**  
1.0 mile

**Parameters**  
AMBIENT\_LIGHT\_PARAMETER-05

Rank	Crit. Ratio	County	Road	Road Name	Beg MP	End MP	# Accs	Notes
1	10.12	1	355D	Harmony Road	0	0.05	1	<10 accidents - Did not meet criteria
2	5.93	1	34H	US 13	0	0.1	1	<10 accidents - Did not meet criteria
3	4.48	1	367	Welsh Tract Road	0	0.99	19	Location #1
4	4.48	1	367	Welsh Tract Road	0.1	1.09	19	Location #1
5	4.01	1	367	Welsh Tract Road	0.2	1.19	17	Location #1
6	4.01	1	367	Welsh Tract Road	0.3	1.29	17	Location #1
7	3.78	1	367	Welsh Tract Road	0.4	1.39	16	Location #1
8	3.76	1	367	Welsh Tract Road	0.5	1.49	16	Location #1
9	3.7	3	199	Fowlers Beach Road	1.2	2.15	4	<10 accidents - Did not meet criteria
10	3.6	1	11A	Delaware Park Road	0	0.15	4	<10 accidents - Did not meet criteria
11	3.56	3	246	Albury Avenue	0.9	1.89	7	<10 accidents - Did not meet criteria
12	3.55	3	199	Fowlers Beach Road	1.1	2.09	4	<10 accidents - Did not meet criteria
13	3.51	3	396		1.8	2.79	6	<10 accidents - Did not meet criteria
14	3.51	3	396		1.9	2.89	6	<10 accidents - Did not meet criteria
15	3.46	2	14	SR 42	3	3.91	5	<10 accidents - Did not meet criteria
16	3.43	1	31A	Old Limestone Road	0	0.31	1	<10 accidents - Did not meet criteria
17	3.43	3	14C		0	0.29	1	<10 accidents - Did not meet criteria
18	3.27	3	60	SR 54	3.1	4.09	7	<10 accidents - Did not meet criteria
19	3.27	3	60	SR 54	3.2	4.19	7	<10 accidents - Did not meet criteria
20	3.27	3	60	SR 54	3.3	4.29	7	<10 accidents - Did not meet criteria
21	3.25	1	38	St. Andrews School Road	0	0.99	7	<10 accidents - Did not meet criteria
22	3.23	2	429	Mechanic Street	3.1	4.09	6	<10 accidents - Did not meet criteria
23	3.23	2	429	Mechanic Street	3.2	4.19	6	<10 accidents - Did not meet criteria
24	3.23	2	429	Mechanic Street	3.3	4.29	6	<10 accidents - Did not meet criteria
25	3.18	1	429	Mechanic Street	3.8	4.79	7	<10 accidents - Did not meet criteria
26	3.14	2	14	SR 42	2.9	3.89	5	<10 accidents - Did not meet criteria
27	3.09	2	14	SR 42	2.8	3.79	5	<10 accidents - Did not meet criteria
28	3.05	2	14	SR 42	2.7	3.69	5	<10 accidents - Did not meet criteria
29	3.05	3	246	Albury Avenue	1	1.99	6	<10 accidents - Did not meet criteria
30	3.04	2	14	SR 42	2.6	3.59	5	<10 accidents - Did not meet criteria
31	3.02	1	367	Welsh Tract Road	0.6	1.59	13	Location #1
32	3.02	3	396		2.2	3.16	5	<10 accidents - Did not meet criteria
33	3	3	542A		0	0.18	1	<10 accidents - Did not meet criteria
34	2.93	3	396		2	2.99	5	<10 accidents - Did not meet criteria
35	2.93	3	396		2.1	3.09	5	<10 accidents - Did not meet criteria
36	2.83	1	355B		0	0.26	1	<10 accidents - Did not meet criteria
37	2.83	3	361	West Avenue	2.3	3.29	8	<10 accidents - Did not meet criteria
38	2.81	1	12A	Farrand Drive Ext.	0	0.1	2	<10 accidents - Did not meet criteria
39	2.8	3	60	SR 54	4.8	5.79	6	<10 accidents - Did not meet criteria
40	2.8	3	60	SR 54	4.9	5.89	6	<10 accidents - Did not meet criteria
41	2.8	3	60	SR 54	5	5.99	6	<10 accidents - Did not meet criteria
42	2.79	3	361	West Avenue	2.2	3.19	8	<10 accidents - Did not meet criteria
43	2.78	3	361	West Avenue	2.1	3.09	8	<10 accidents - Did not meet criteria
44	2.75	3	261		1.1	2.09	8	<10 accidents - Did not meet criteria
45	2.71	1	429	Mechanic Street	3.7	4.69	6	<10 accidents - Did not meet criteria
46	2.71	3	544		0.2	1.19	6	<10 accidents - Did not meet criteria
47	2.69	1	224	Upper Snuffmill Road	0	0.95	6	<10 accidents - Did not meet criteria
48	2.69	1	429	Mechanic Street	3.6	4.59	6	<10 accidents - Did not meet criteria
49	2.69	2	429	Mechanic Street	2.8	3.79	5	<10 accidents - Did not meet criteria
50	2.69	2	429	Mechanic Street	2.9	3.89	5	<10 accidents - Did not meet criteria
51	2.69	2	429	Mechanic Street	3	3.99	5	<10 accidents - Did not meet criteria
52	2.66	3	199	Fowlers Beach Road	0.8	1.79	3	<10 accidents - Did not meet criteria
53	2.66	3	199	Fowlers Beach Road	0.9	1.89	3	<10 accidents - Did not meet criteria
54	2.66	3	199	Fowlers Beach Road	1	1.99	3	<10 accidents - Did not meet criteria
55	2.65	1	315A		0	0.08	1	<10 accidents - Did not meet criteria
56	2.65	3	261		1.2	2.19	7	<10 accidents - Did not meet criteria
57	2.58	1	318A	St. James Church Road	0	0.24	1	<10 accidents - Did not meet criteria
58	2.58	3	246		0.5	1.49	5	<10 accidents - Did not meet criteria
59	2.58	3	544		0.1	1.09	6	<10 accidents - Did not meet criteria
60	2.56	3	246	Albury Avenue	0.6	1.59	5	<10 accidents - Did not meet criteria
61	2.55	2	127		0	0.41	1	<10 accidents - Did not meet criteria
62	2.55	3	246	Albury Avenue	0.7	1.69	5	<10 accidents - Did not meet criteria
63	2.55	3	246	Albury Avenue	0.8	1.79	5	<10 accidents - Did not meet criteria
64	2.55	3	246	Albury Avenue	1.1	2.09	5	<10 accidents - Did not meet criteria

**Delaware - Statewide**

**Accident Date Range**

01/01/2007 - 12/31/2009

**Interval Length**

1.0 mile

**Parameters**

AMBIENT\_LIGHT\_PARAMETER-05

Rank	Crit. Ratio	County	Road	Road Name	Beg MP	End MP	# Accs	Notes
65	2.55	3	261		1	1.99	8	<10 accidents - Did not meet criteria
66	2.51	3	28	US 9	6	6.99	14	Location #2
67	2.5	2	295		0	0.99	3	<10 accidents - Did not meet criteria
68	2.5	2	295		0.1	1.09	3	<10 accidents - Did not meet criteria
69	2.46	3	361	West Avenue	1.9	2.89	8	<10 accidents - Did not meet criteria
70	2.44	2	88		0.2	1.19	4	<10 accidents - Did not meet criteria
71	2.43	2	14	SR 42	2.4	3.39	4	<10 accidents - Did not meet criteria
72	2.43	2	14	SR 42	2.5	3.49	4	<10 accidents - Did not meet criteria
73	2.42	2	88		0.3	1.29	4	<10 accidents - Did not meet criteria
74	2.4	2	88		0.4	1.39	4	<10 accidents - Did not meet criteria
75	2.4	3	544		0.3	1.29	5	<10 accidents - Did not meet criteria
76	2.38	2	14	SR 42	2.3	3.29	4	<10 accidents - Did not meet criteria
77	2.37	1	454	Sawmill Branch Road	0.5	1.46	3	<10 accidents - Did not meet criteria
78	2.37	3	28	US 9	5.9	6.89	13	Location #2
79	2.35	1	275	Golden Ring Road	1.4	2.39	8	<10 accidents - Did not meet criteria
80	2.35	1	275	Golden Ring Road	1.5	2.49	8	<10 accidents - Did not meet criteria
81	2.35	3	261		0.9	1.89	8	<10 accidents - Did not meet criteria
82	2.34	2	88		0.5	1.49	4	<10 accidents - Did not meet criteria
83	2.34	3	396		1.7	2.69	4	<10 accidents - Did not meet criteria
84	2.34	3	60	SR 54	3	3.99	5	<10 accidents - Did not meet criteria
85	2.34	3	60	SR 54	3.4	4.39	5	<10 accidents - Did not meet criteria
86	2.34	3	60	SR 54	3.5	4.49	5	<10 accidents - Did not meet criteria
87	2.34	3	60	SR 54	3.6	4.59	5	<10 accidents - Did not meet criteria
88	2.34	3	60	SR 54	3.7	4.69	5	<10 accidents - Did not meet criteria
89	2.34	3	60	SR 54	3.8	4.79	5	<10 accidents - Did not meet criteria
90	2.34	3	60	SR 54	5.1	6.09	5	<10 accidents - Did not meet criteria
91	2.32	3	361		2	2.99	7	<10 accidents - Did not meet criteria
92	2.31	2	271		3.1	4.01	2	<10 accidents - Did not meet criteria
93	2.28	1	260	Brecks Lane Road	0	0.57	2	<10 accidents - Did not meet criteria
94	2.28	2	384		3	3.99	7	<10 accidents - Did not meet criteria
95	2.27	2	88		0.1	1.09	4	<10 accidents - Did not meet criteria
96	2.22	1	429	Mechanic Street	3.5	4.49	5	<10 accidents - Did not meet criteria
97	2.22	2	207		2.9	3.89	4	<10 accidents - Did not meet criteria
98	2.22	2	207		3	3.99	4	<10 accidents - Did not meet criteria
99	2.21	1	429	Mechanic Street	3.3	4.29	5	<10 accidents - Did not meet criteria
100	2.21	1	82	SR 1	5.5	6.49	12	Location #3
101	2.19	3	261		0.8	1.79	8	<10 accidents - Did not meet criteria
102	2.17	1	275	Golden Ring Road	1.6	2.59	7	<10 accidents - Did not meet criteria
103	2.17	1	469	Black Diamond Road	0.4	1.39	3	<10 accidents - Did not meet criteria
104	2.17	1	469	Black Diamond Road	0.5	1.49	3	<10 accidents - Did not meet criteria
105	2.17	1	469	Black Diamond Road	0.6	1.59	3	<10 accidents - Did not meet criteria
106	2.17	1	469	Black Diamond Road	0.7	1.69	3	<10 accidents - Did not meet criteria
107	2.16	3	28	US 9	9.1	10.09	13	Location #4
108	2.15	2	30	Main Street	1.5	2.49	9	<10 accidents - Did not meet criteria
109	2.15	2	429		2.7	3.69	4	<10 accidents - Did not meet criteria
110	2.15	2	429		3.4	4.39	4	<10 accidents - Did not meet criteria
111	2.15	2	429		3.6	4.59	4	<10 accidents - Did not meet criteria
112	2.15	3	353		2.3	3.29	3	<10 accidents - Did not meet criteria
113	2.15	3	525		1.8	2.79	7	<10 accidents - Did not meet criteria
114	2.15	3	525		1.9	2.89	7	<10 accidents - Did not meet criteria
115	2.15	3	525		2	2.99	7	<10 accidents - Did not meet criteria
116	2.15	3	525		2.1	3.09	7	<10 accidents - Did not meet criteria
117	2.15	3	525		2.2	3.19	7	<10 accidents - Did not meet criteria
118	2.14	3	28	US 9	6.1	7.09	12	Location #2
119	2.14	3	361		2.4	3.39	6	<10 accidents - Did not meet criteria
120	2.13	1	452	Fieldsboro Road	0	0.99	3	<10 accidents - Did not meet criteria
121	2.13	1	452	Fieldsboro Road	0.1	1.09	3	<10 accidents - Did not meet criteria
122	2.13	1	452	Fieldsboro Road	0.2	1.19	3	<10 accidents - Did not meet criteria
123	2.13	1	452	Fieldsboro Road	0.3	1.29	3	<10 accidents - Did not meet criteria
124	2.13	1	452	Fieldsboro Road	0.4	1.39	3	<10 accidents - Did not meet criteria
125	2.13	1	452	Fieldsboro Road	0.5	1.49	3	<10 accidents - Did not meet criteria
126	2.13	1	452	Fieldsboro Road	0.6	1.59	3	<10 accidents - Did not meet criteria
127	2.13	2	30	Main Street	1.6	2.59	9	<10 accidents - Did not meet criteria
128	2.13	3	353		2.4	3.39	3	<10 accidents - Did not meet criteria

**Delaware - Statewide**

**Accident Date Range**

01/01/2007 - 12/31/2009

**Interval Length**

1.0 mile

**Parameters**

AMBIENT\_LIGHT\_PARAMETER-05

Rank	Crit. Ratio	County	Road	Road Name	Beg MP	End MP	# Accs	Notes
129	2.12	2	8	US 113	9.6	10.59	13	Location #5
130	2.12	3	24	SR 24	18.2	19.19	7	<10 accidents - Did not meet criteria
131	2.12	3	24	SR 24	18.4	19.39	7	<10 accidents - Did not meet criteria
132	2.12	3	24	SR 24	18.5	19.49	7	<10 accidents - Did not meet criteria
133	2.11	3	246	Albury Avenue	0.3	1.29	4	<10 accidents - Did not meet criteria
134	2.11	3	261		1.3	2.29	5	<10 accidents - Did not meet criteria
135	2.11	3	353		2.1	3.09	3	<10 accidents - Did not meet criteria
136	2.11	3	477		0	0.99	3	<10 accidents - Did not meet criteria
137	2.1	1	26	Old Baltimore Pike	2.5	3.49	21	Location #6
138	2.1	3	48		7.2	8.19	7	<10 accidents - Did not meet criteria
139	2.1	3	48		7.3	8.29	7	<10 accidents - Did not meet criteria
140	2.1	3	48		7.4	8.39	7	<10 accidents - Did not meet criteria
141	2.1	3	48		7.5	8.49	7	<10 accidents - Did not meet criteria
142	2.1	3	48		7.6	8.59	7	<10 accidents - Did not meet criteria
143	2.1	3	48		7.7	8.69	7	<10 accidents - Did not meet criteria
144	2.1	3	48		7.8	8.79	7	<10 accidents - Did not meet criteria
145	2.1	3	48		7.9	8.89	7	<10 accidents - Did not meet criteria
146	2.1	3	48		8	8.99	7	<10 accidents - Did not meet criteria
147	2.09	2	30	Main Street	0.7	1.69	7	<10 accidents - Did not meet criteria
148	2.09	3	246	Albury Avenue	0.4	1.39	4	<10 accidents - Did not meet criteria
149	2.09	3	28	US 9	8.9	9.89	12	Location #4
150	2.07	3	246	Albury Avenue	1.8	2.7	3	<10 accidents - Did not meet criteria
151	2.07	3	326	State Street	0.8	1.79	8	<10 accidents - Did not meet criteria
152	2.06	2	188		0	0.32	1	<10 accidents - Did not meet criteria
153	2.06	3	353		2	2.99	3	<10 accidents - Did not meet criteria
154	2.06	3	353		2.5	3.49	3	<10 accidents - Did not meet criteria
155	2.05	1	26	Old Baltimore Pike	2.8	3.79	21	Location #6
156	2.05	3	594		0	0.99	6	<10 accidents - Did not meet criteria
157	2.04	2	30	Main Street	0.4	1.39	7	<10 accidents - Did not meet criteria
158	2.04	3	246		1.2	2.19	4	<10 accidents - Did not meet criteria
159	2.04	3	28	US 9	9	9.99	12	Location #4
160	2.04	3	544		0.4	1.39	4	<10 accidents - Did not meet criteria
161	2.03	2	303		1.2	2.19	2	<10 accidents - Did not meet criteria
162	2.02	1	301	Thompson's Station Road	0.3	1.29	9	<10 accidents - Did not meet criteria
163	2.02	1	301	Thompson's Station Road	0.4	1.39	9	<10 accidents - Did not meet criteria
164	2.02	2	54	Main Street	0.1	1.09	6	<10 accidents - Did not meet criteria
165	2.02	2	54	Main Street	0.2	1.19	6	<10 accidents - Did not meet criteria
166	2.02	2	54	Main Street	0.3	1.29	6	<10 accidents - Did not meet criteria
167	2.02	2	54	Main Street	0.4	1.39	6	<10 accidents - Did not meet criteria
168	2.02	2	54	Main Street	0.5	1.49	6	<10 accidents - Did not meet criteria
169	2.01	3	28	US 9	5.8	6.79	11	Location #4
170	2.01	3	488		2.8	3.79	4	<10 accidents - Did not meet criteria
171	2.01	3	488		2.9	3.89	4	<10 accidents - Did not meet criteria
172	2	1	82	SR 1	5.6	6.59	12	Location #3
173	2	1	9	SR 52	3.2	4.19	16	Location #7
174	2	2	8	US 113	9.7	10.69	12	Location #5
175	1.99	3	361		1.8	2.79	7	<10 accidents - Did not meet criteria
176	1.99	3	479A		0	0.6	2	<10 accidents - Did not meet criteria
177	1.98	1	26	Old Baltimore Pike	2.6	3.59	20	Location #6
178	1.98	1	26	Old Baltimore Pike	2.9	3.89	20	Location #6
179	1.98	1	9	SR 52	3.1	4.09	16	Location #7
180	1.98	2	325	Big Oak Road	1.4	2.39	4	<10 accidents - Did not meet criteria
181	1.98	2	73	North Street	4.3	5.29	7	<10 accidents - Did not meet criteria
182	1.98	3	207		1.3	2.29	7	<10 accidents - Did not meet criteria
183	1.98	3	353		1.9	2.89	3	<10 accidents - Did not meet criteria
184	1.98	3	544		1	1.99	2	<10 accidents - Did not meet criteria
185	1.97	1	26	Old Baltimore Pike	2.7	3.69	20	Location #6
186	1.97	2	30	Main Street	1.4	2.39	8	<10 accidents - Did not meet criteria
187	1.97	3	2	US 13	3.6	4.59	18	Location #8
188	1.96	1	383	Church Road	0.4	1.37	8	<10 accidents - Did not meet criteria
189	1.96	2	30	Main Street	0.3	1.29	7	<10 accidents - Did not meet criteria
190	1.96	2	384		3.1	4.09	6	<10 accidents - Did not meet criteria
191	1.96	3	16	SR 16	25.8	26.79	5	<10 accidents - Did not meet criteria
192	1.96	3	16	SR 16	25.9	26.89	5	<10 accidents - Did not meet criteria

**Delaware - Statewide****Accident Date Range**

01/01/2007 - 12/31/2009

**Interval Length**

1.0 mile

**Parameters**

AMBIENT\_LIGHT\_PARAMETER-05

Rank	Crit. Ratio	County	Road	Road Name	Beg MP	End MP	# Accs	Notes
193	1.96	3	16	SR 16	26	26.99	5	<10 accidents - Did not meet criteria
194	1.96	3	16	SR 16	26.1	27.09	5	<10 accidents - Did not meet criteria
195	1.96	3	353		2.6	3.59	3	<10 accidents - Did not meet criteria
196	1.95	2	73	North Street	4.2	5.19	7	<10 accidents - Did not meet criteria
197	1.95	3	326	State Street	0.7	1.69	8	<10 accidents - Did not meet criteria
198	1.94	1	32	US 40	4.2	5.19	25	Location #9
199	1.94	2	73	North Street	4.4	5.39	7	<10 accidents - Did not meet criteria
200	1.94	3	213	Walnut Street	8.1	9.09	5	<10 accidents - Did not meet criteria
201	1.94	3	484		2.7	3.69	4	<10 accidents - Did not meet criteria
202	1.92	1	17	SR 92	0	0.99	17	Location #10