WILMAPCO

February 2016 — WILMAPCO DATA REPORT #6 UPDATE

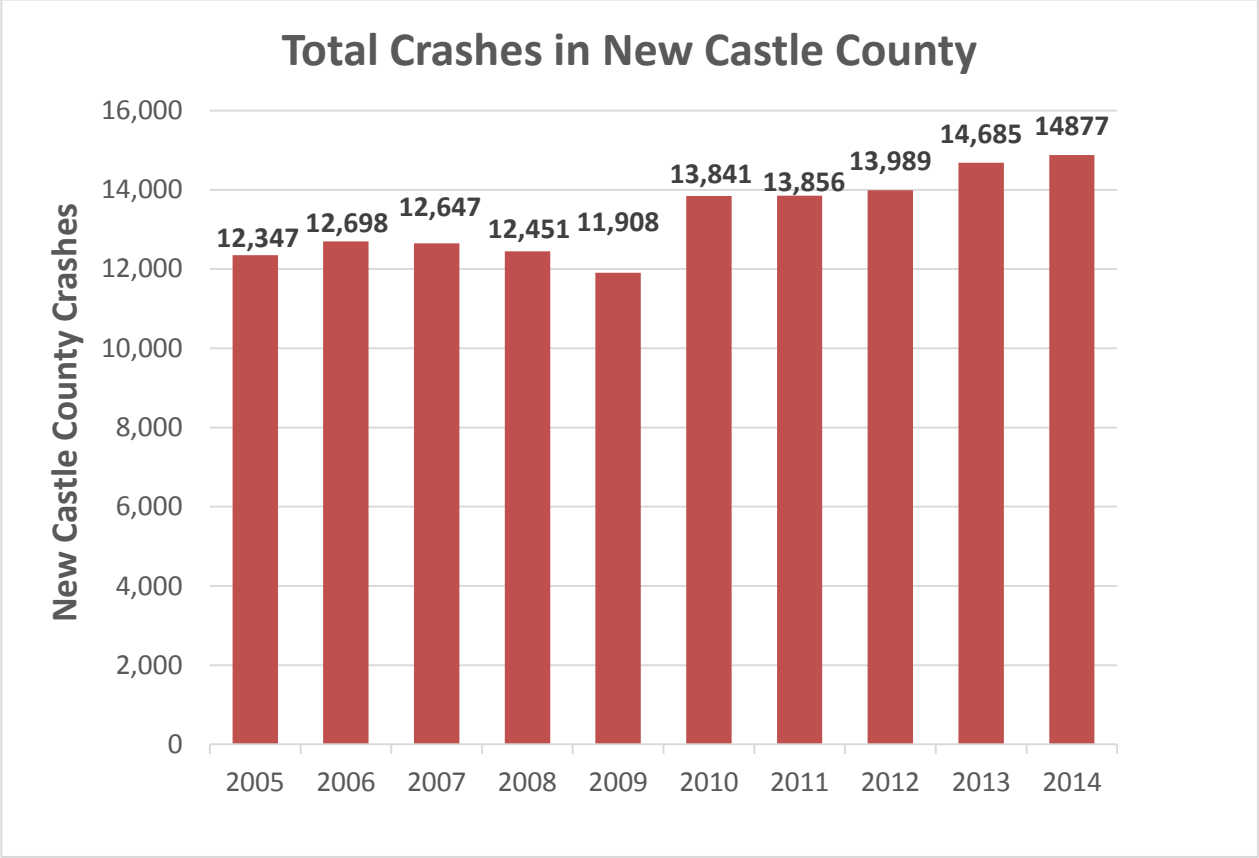
New Castle County Intersection Crash Analysis 2005-2014

By examining statistics we catch a glimpse of recent crash trends. This report compares overall crash trends for New Castle County, Delaware. It also profiles the intersections in New Castle County with the current highest three-year crash average (2011-2013).

- Overall, total crashes increased by 20% between 2005 and 2014 in the New Castle County region.

- Figure 1 shows the highest number of accidents was reported in 2014 with 14,877 crashes, 2,530 more than in 2005.
- There is an increasing trend for total crashes in New Castle County, despite a subtle decrease of 790 crashes (-6.2%) from 2006 to 2009.
- The biggest single-year jump for total crashes occurred between 2009 and 2010, 11,908 crashes to 13,841 crashes. This is an increase of 1933 total crashes within one year.

Figure 1: Total Crashes in New Castle County, 2005 to 2014

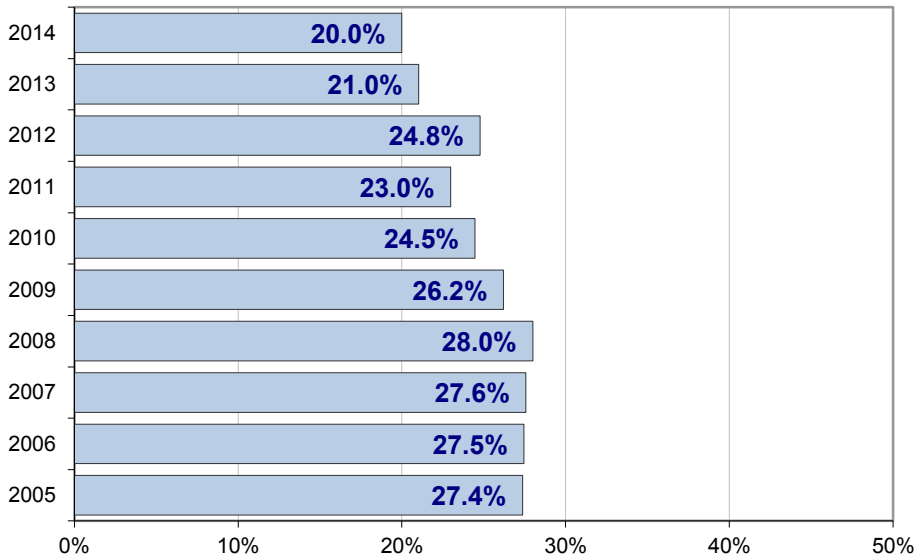


Source: Delaware State Police, Annual Traffic Statistical Reports, 2005-2014

Personal Injury Crashes

- In New Castle County, the number of personal injury crashes declined by 7.4% from 2005 to 2014.
- In New Castle County, personal injuries occur in roughly one-quarter (24.98%) of total crashes. The highest number of personal injury crashes in a year was 3,486 in 2006.
- The highest percentage of personal injury crashes in New Castle County occurred in 2008 at 28%. This number has been steadily decreasing, with the exception of a slight increase in 2012.

Figure 2: Percentage of Total Crashes Involving Personal Injury



Sources: Delaware State Police, Annual Traffic Statistical Reports 2005-2013; Maryland State Highway Administration,

Alcohol Related Crashes

- New Castle County had a drop of 222 crashes from 2005 to 2014, or 27%. This results in a percentage drop of 2.6% of total crashes.
- The highest number of alcohol-related crashes in New Castle County occurred in 2007, with 854 alcohol-related crashes.
- The highest percentage of total crashes in New Castle County that were alcohol related also occurred in 2007 with 6.8% of total crashes being alcohol-related.

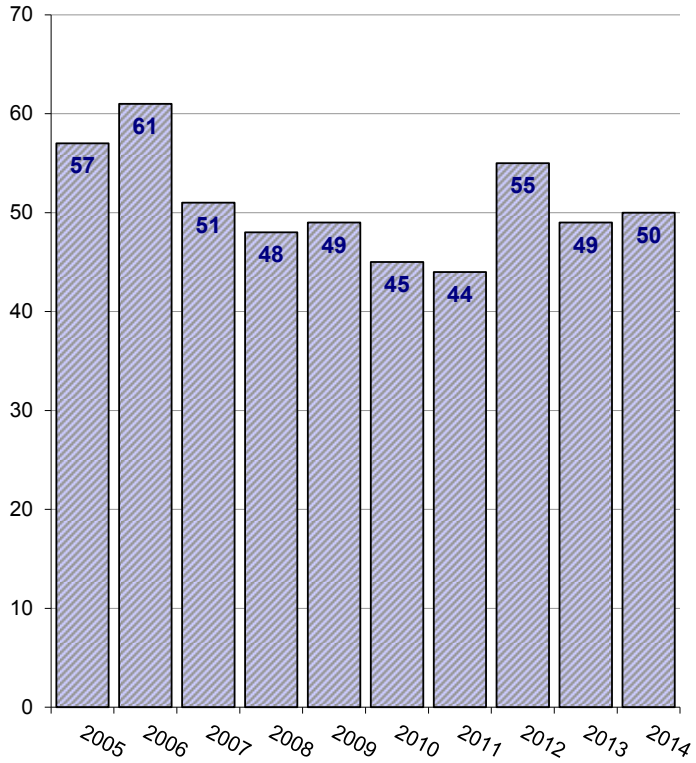
Table 1: Alcohol-Related* Crashes in the New Castle County, 2005 to 2014

	New Castle County	
	Alcohol-Related Crashes	% of Total Crashes
2005	807	6.5%
2006	836	6.6%
2007	854	6.8%
2008	756	6.1%
2009	665	5.6%
2010	709	5.1%
2011	656	4.7%
2012	690	4.9%
2013	630	4.3%
2014	585	3.9%
2005 - 2014	7,188	5.4%

*A crash is considered alcohol related if either the motorist or non-motorist involved has consumed alcohol, regardless of the blood-alcohol level.

Fatal Crashes

Figure 3: Total Fatal Crashes



Sources: Delaware State Police, Annual Traffic Statistical Reports 2005-2013; Maryland State Highway Administration, Office of Traffic & Safety

- From 2005 to 2014, fatal crashes decreased by roughly 12% for New Castle County
- Following along with the personal injury crash trends, the number of fatal crashes in New Castle County was decreasing from 2006—2011, then jumped back up in 2012. The county's average number of fatal crashes from 2005 to 2014 was 51 per year.
- Figure 4 to the right shows the locations of all fatal crashes in New Castle County from 2005 to 2014. There were 456 crashes that resulted in one fatality, accounting for 0.34% of all crashes. Six crash locations resulted in three or more fatalities over the nine years.
- Of these fatal crashes, approximately 44% occurred within an intersection, which will be discussed in more detail later in the report.
- Figure 5 shows the distribution of fatal crashes by impact type, with 51% of fatal crashes caused by angled collisions.

Figure 4: Locations of Fatal Crashes in New Castle County , 2005 to 2014

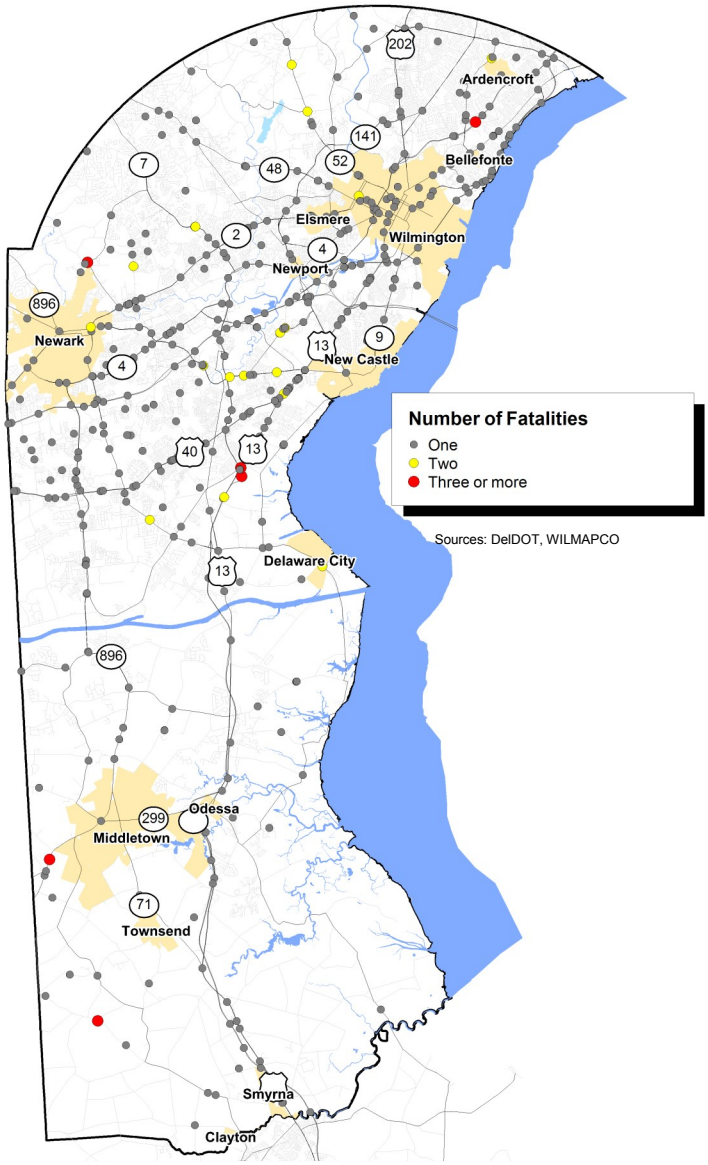
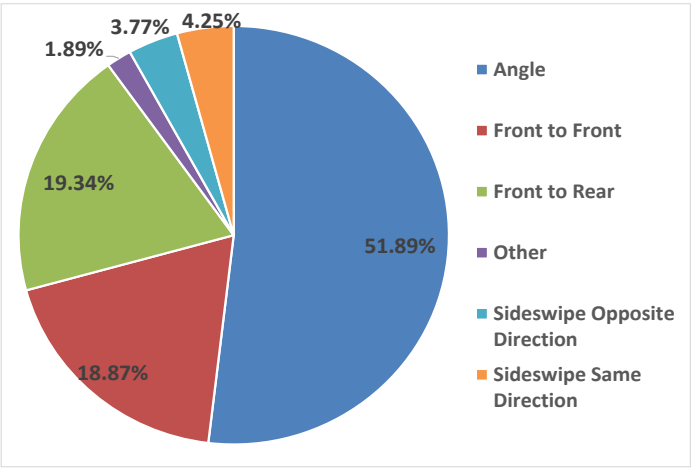


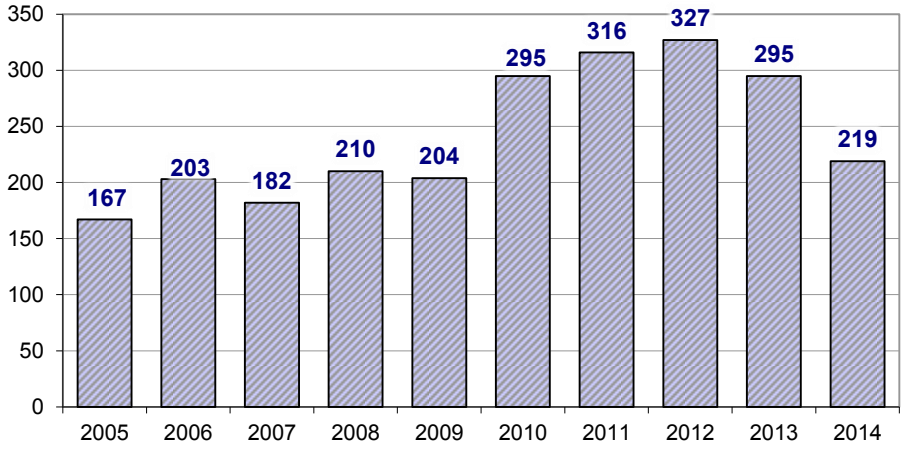
Figure 5: Fatal Crash Impact Type
*excluding crash type "unknown"



Pedestrian Crashes

- In New Castle County, pedestrian crashes experienced a 49% increase from 2005 to 2012.
- Overall from 2005 to 2014 New Castle County experienced a 31% increase in the amount of pedestrian crashes.
- From 2005 to 2014, New Castle County averaged 242 pedestrian crashes, which is about 1.9% of average total crashes.
- In New Castle County, roughly 91% of pedestrian collisions resulted in personal injury, while another 6% were fatal.

Figure 6: Pedestrian Crashes in the WILMAPCO Region

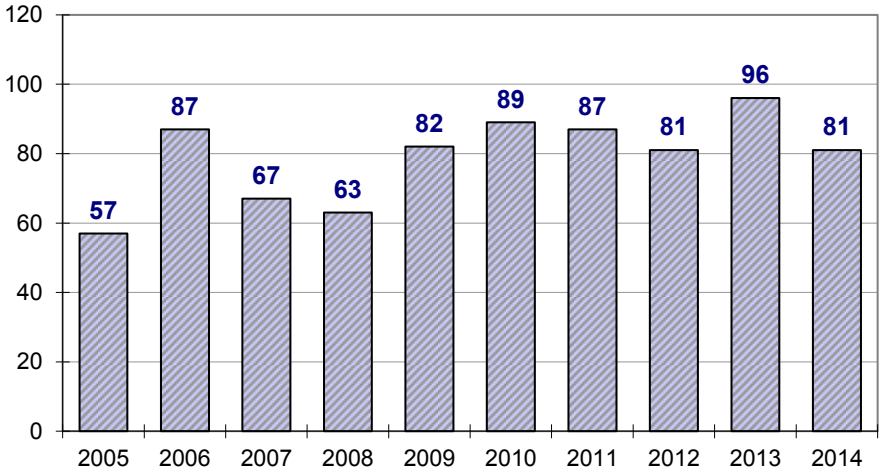


Sources: Delaware State Police, Annual Traffic Statistical Reports, 2005-2013; Maryland State Highway Administration, Office of Traffic & Safety

Bicycle Crashes

- In New Castle County, from 2005 to 2013, bike crashes increased by 39 cases, or 40%.
- The greatest increase in New Castle County occurred from 2005 to 2006 by roughly 34%, followed by a sharp decrease the next year.
- Similar to pedestrians, 91% of cyclist collisions in New Castle County caused personal injury, and 3.5% ended in fatality.

Figure 7: Bicycle Crashes in the WILMAPCO Region



Sources: Delaware State Police, Annual Traffic Statistical Reports, 2005-2013

Pedestrian and Bicycle Crashes

- From 2005 to 2014, New Castle County had a total of 2,418 pedestrian crashes, of which 51% took place at an intersection.
- During the same time, New Castle County had a total of 790 bike crashes. Just under 60% took place at an intersection.
- The number of intersection ped. crashes has significantly gone down from 2012-2014.

Table 2: Non-Motorized Intersection Crashes in New Castle County

	Intersection Ped. Crashes	% of Total Ped. Crashes	Intersection Bike Crashes	% of Total Bike Crashes
2005	107	76.4%	46	83.6%
2006	132	65.7%	62	73.8%
2007	112	61.2%	38	67.9%
2008	138	64.2%	46	73.0%
2009	137	66.8%	61	76.3%
2010	122	64.2%	47	71.2%
2011	129	60.0%	33	63.5%
2012	139	61.8%	37	90.2%
2013	106	63.5%	52	80.0%
2014	97	44.3%	46	56.8%
2005 - 2014	1219	51.0%	468	59.5%

Overall Intersection Crashes for New Castle County

- An intersection crash is defined as occurring within an intersection's "sphere of influence" which varies at each location based on factors such as intersection width and acceleration lanes. An example of an intersection buffer can be seen to the right in Figure 8.
- In 2014, roughly 57% (7,899) of the total crashes for New Castle County happened within an intersection.
- The intersections with the highest number of crashes for 2012-2014 are shown in Figure 9 to the right, with the top ten highlighted in Table 3 below.
- An in-depth look at the crashes at these ten locations is provided at the end of this document.
- The new crash ranking method performed for this analysis takes into account frequency, severity and cost. Further details on this method can be found on pages 8-10.
- Of the top intersection crash locations, SR 7 (Limestone Road) and SR 2 (Kirkwood Highway) rank 1st in crash frequency with an average of 72 crashes over 2012-2014.
- SR 2 and SR 7 also ranks 1st in terms of crash cost based on manner of impact. Crash costs total to $4,310,530 for 2012-2014.
- US 13 and Bacon Avenue ranked 1st in terms of crash severity based on the KABCO method (pg. 10), with severity index of 286.

Figure 8: Sample Intersection Buffer

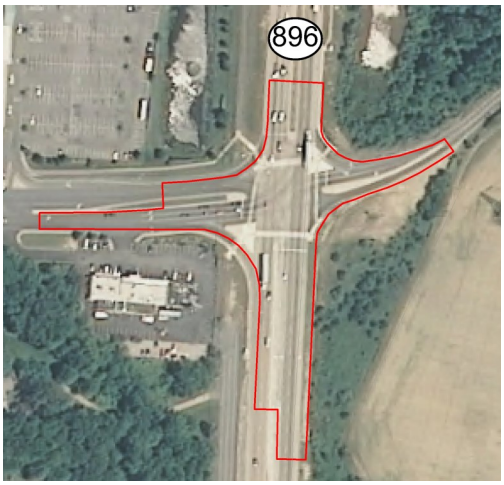


Figure 9: Current Top Twenty Intersection Crash Locations

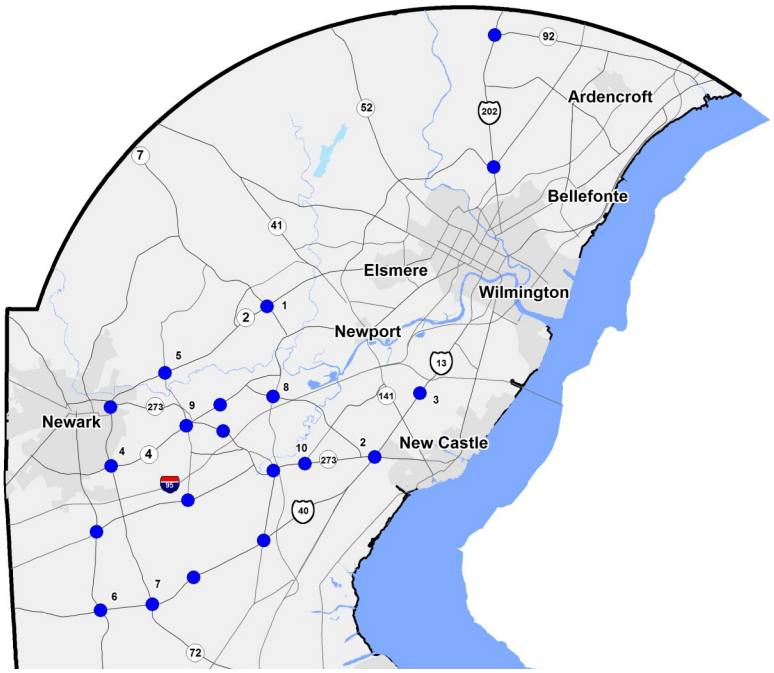


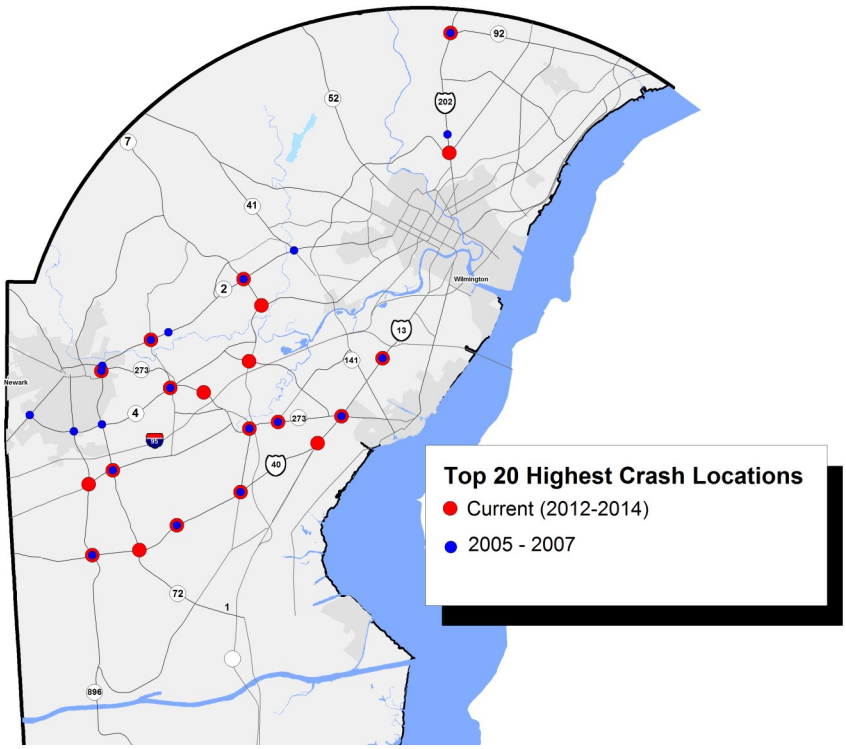
Table 3: Current Top Ten Intersection Crash Locations

Final Rank	Full_name	Intersection Type
1	SR 2 (Kirkwood Hwy) &SR 7 (Limestone Rd.)	Class #5: Principal Arterial vs. Principal Arterial
2	US 13 &SR 273	Class #5: Principal Arterial vs. Principal Arterial
3	US 13 &BACON AVE	Class #2: Principal Arterial vs. Local/Collector
4	SR 2 (Kirkwood Hwy) &RED MILL RD	Class #4: Principal Arterial vs. Minor Arterial
5	SR 273 &Airport Rd.	Class #4: Principal Arterial vs. Minor Arterial
6	SR 7 &SR 58 (CHURCHMANS RD)	Class #5: Principal Arterial vs. Principal Arterial
7	SR 7 &SR 273	Class #5: Principal Arterial vs. Principal Arterial
8	US 40 &SR 7	Class #5: Principal Arterial vs. Principal Arterial
9	SR 4 & SR 72	Class #5: Principal Arterial vs. Principal Arterial
10	US 40 & SR 896	Class #4: Principal Arterial vs. Principal Arterial

Changes in Intersection Crash Trends

- Figure 13 to the right shows the changes in the top twenty highest intersection crash locations from 2005—2007 to 2012—2014.
- Of the current top twenty locations, more than half of them (11) have been in the top twenty since 2005, as shown both on the map and in Table 4.
- Of these eleven intersection locations, seven of them are a part of the top ten intersection crash locations listed on the previous page (Table 3).
- The intersection of US 13 & Bacon Ave. has seen the greatest decrease (28%) in total crashes, despite being in the current top ten crash locations. Its 2005—2007 average yearly crash total was 65, and its current average is 51 per year.
- One of the newer top ten intersection crash locations is SR 7 & SR 58 (Churchman's Road) with an increase of 176% between the 2005—2007 average to the 2012—2014 average.
- All of the current top ten locations have an annual total crash average above 40 crashes per year.
- Eight out of the top ten locations have seen an increase in total crash average since the 2005—2007 period.
- Nine out of the top ten locations are classified as either a Class #5 (intersection of two principal arterials) or a Class #4 (intersection of a principal and minor arterial). The outlier is US 13 & Bacon Avenue, which is only a Class #2 intersection (principle arterial vs. local/collector road)

Figure 12: High Intersection Crash Locations in New Castle County, 2005-2007; 2012-2014



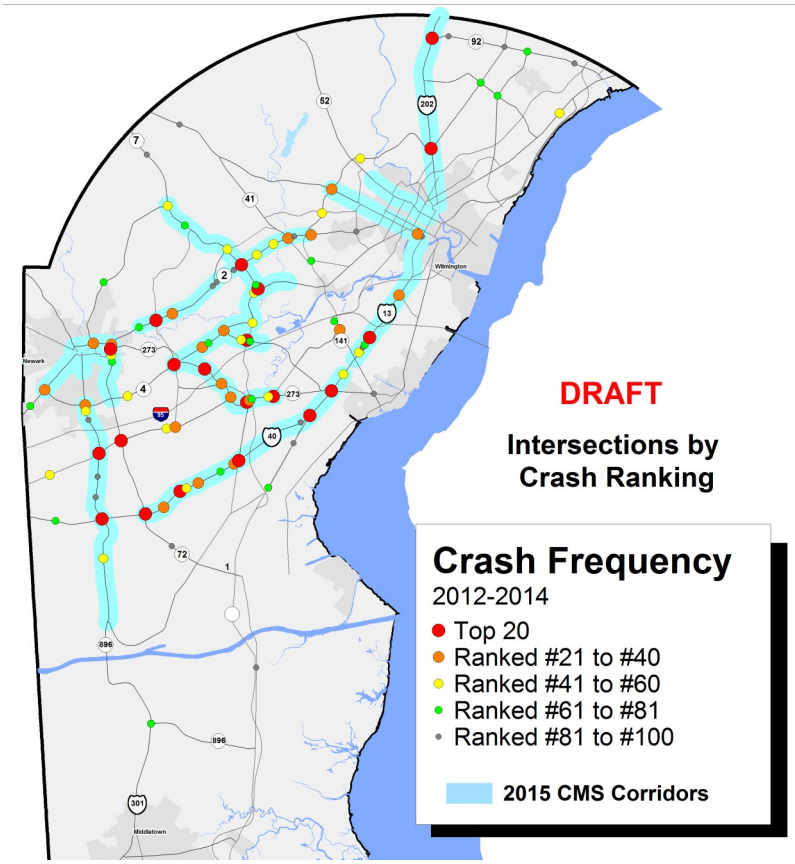
Sources: DelDOT, WILMAPCO

Table 4: Changes in Top 20 Intersections

Intersection Name	Top 20 Highest Intersection Crash Locations				
	2005 - 2007	*2007 - 2009*	*2009 - 2011*	*2011 - 2013*	*2012-2014*
SR 2 & Cleveland Ave.	✓	✓			
SR 2 & Milltown Rd.		✓			
SR 2 & SR 41	✓	✓	✓		
SR 2 (Kirkwood Hwy) & Harmony Rd.	✓				
SR 2 (Kirkwood Hwy) & Red Mill Rd.	✓	✓	✓	✓	✓
SR 2 (Kirkwood Hwy) & SR 7 (Limestone Rd.)	✓	✓	✓	✓	✓
SR 273 & Airport Rd.	✓			✓	✓
SR 273 (Christiana Rd.) & Harmony Rd.			✓	✓	✓
SR 273 & Main St.	✓	✓	✓	✓	✓
SR 4 & Harmony Rd.				✓	
SR 4 & Salem Church Rd.	✓		✓	✓	✓
SR 4 & SR 72	✓	✓	✓	✓	✓
SR 4 & SR 896 (S. College Ave)	✓	✓	✓		
SR 4 / Elkton Rd. & Suburban Plaza Dr.	✓	✓			
SR 7 & SR 273	✓	✓	✓	✓	✓
SR 7 & SR 58 (Churchmans Rd.)			✓	✓	✓
SR 7 (Limestone Rd) & SR 4 (Main St.)			✓	✓	✓
SR 72 & Old Baltimore Pk.	✓			✓	✓
SR 896 & Old Baltimore Pk.			✓	✓	✓
SR 896 (S. College Ave.) & US 40 (Pulaski Hwy.)	✓	✓	✓	✓	✓
US 13 & Bacon Ave.	✓	✓	✓	✓	✓
US 13 & Greater Wilm. Airport		✓	✓		
US 13 & Memorial Dr.		✓			
US 13 & SR 273	✓	✓	✓	✓	✓
US 202 & Murphey Rd. / Powder Mill Rd.	✓	✓			
US 202 & SR 92 (Naamans Rd.)	✓	✓	✓	✓	✓
US 40 & Porter Rd.	✓	✓	✓	✓	✓
US 40 & Scotland Dr.		✓			
US 40 & SR 7	✓	✓	✓	✓	✓
US 40 & SR 72 (Sunset Lake Rd./ Wrangle Hill Rd.)			✓	✓	✓
US 40 & US 13					✓

Frequency

Figure 13: Crash Frequency Ranking Map



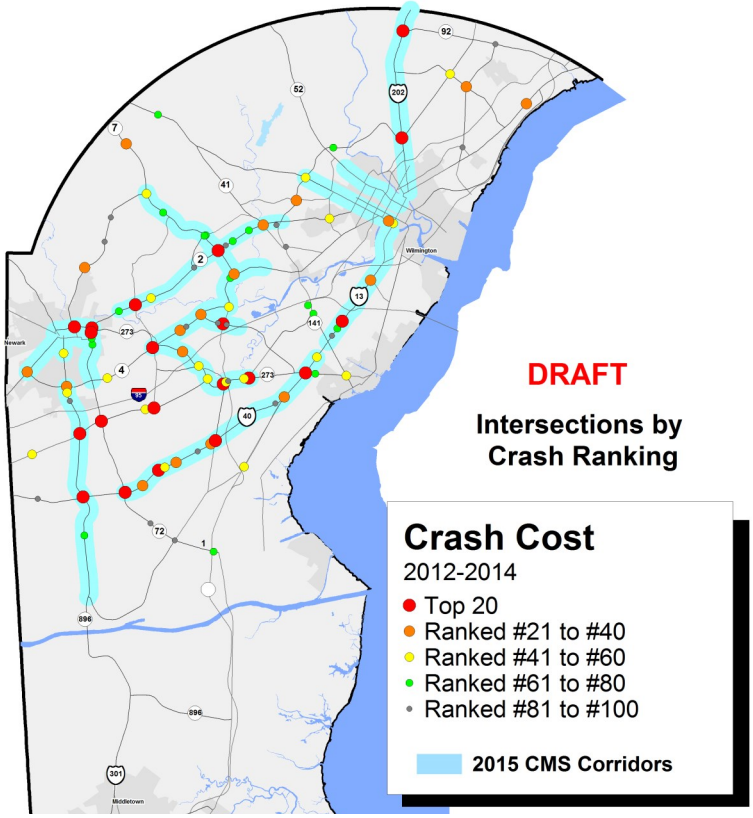
Through observations of the crash frequency rankings, we can see there hasn't been much change in the top 20 intersections from the 2011-13 analysis. However, there are a few minor changes in the top 20 such as US 13 and US 40 intersection. As you can see from the map and table below, the top intersections are SR 7 and SR 2, US 13 and 273 as well as US 13 and Bacon Avenue.

Table 5: Top Locations in Crash Frequency

PERMITNUM	Full_name	AVG_CRSH_ 12_14	Crash Frequency (CFR)
N165	SR 2 (Kirkwood Hwy.) &SR 7 (Limestone Rd.)	72	1
N183	US 13 & SR 273	59.7	2
N217	US 13 & Bacon Ave.	51	3
N191	SR 7 & SR 58 (Churchmans Rd.)	50.3	4
N192	SR 7 & SR 273	50.3	5
N185	US 40 & SR 7	49.7	6
N660	SR 4 &SR 72	47.7	7
N317	SR 2 (Kirkwood Hwy) & Red Mill Rd.	46	8
N242	SR 4 & Salem Church Rd.	41.7	9
N483	SR 896 (S. College Ave.) & US 40 (Pulaski Hwy.)	41	10
N239	US 40 & SR 72 (Sunset Lake Rd./ Wrangle Hill Rd.)	39.7	11
N188	SR 896 & Old Baltiomore Pk.	34	12
N339	SR 273 & Airport Rd.	34	13
N393	US 40 & Porter Rd.	33.3	14
N423T	SR 273 & Main St.	33.3	15
N101	US 202 & SR 92 (Naamans Rd.)	32	16
N182	SR 72 & Old Baltimore Pk.	31.1	17
N225	SR 7 (Limestone Rd) & SR 4 (Main St.)	30.7	18
N337	SR 273 (Christiana Rd.) & Harmony Rd.	30.3	19
N184	US 13 & US 40	30	20
N381	Old Baltimore Pk. & Salem Church Rd. (East)	28.7	21
N351	SR 273 & Old Baltimore Pk.	28.3	22
N312	SR 4 & Harmony Rd.	28	23
N369	SR 4 & Churchmans Rd.	27.7	24
N552	US 40 & Church Rd.	26.7	25

Cost (Manner of Impact)

Figure 14: Crash Cost Ranking Map



The crash cost ranking of intersections were derived based on typical costs based on manner of impact. The amount of crashes of a certain impact type were multiplied by the rate, to come up with a cost total. Please see the table 6 below for the average cost of each impact. As you can see from the top 25 locations below, many of the same intersections remain as when ranked by frequency.

Table 6: Manner of Impact Table

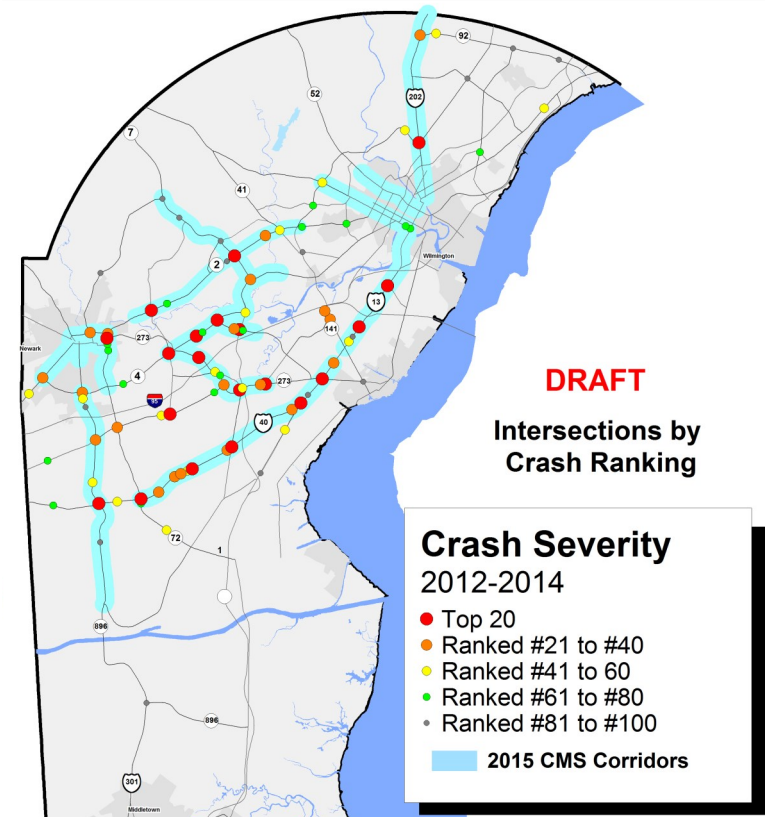
Manner of Impact Code	Manner of Impact	Average Cost
00	Not a collision between two vehicles (Single vehicle crash)	$59,428
01	Front to rear	$12,163
02	Front to Front	$81,100
03	Angle	$34,477
04	Sideswipe, same direction	$8,817
05	Sideswipe, opposite direction	$17,141
06	Rear to side	$3,151
07	Rear to rear	$3,151
99	Other & Unknown	$38,868

Table 7: Top Locations in Crash Cost

PERMITNUM	Full_name	Cost Totals (CCR)	CCR Rank
N165	SR 2 (Kirkwood Hwy.) &SR 7 (Limestone Rd.)	$4,310,530	1
N183	US 13 & SR 273	$3,586,745	2
N317	SR 2 (Kirkwood Hwy) & Red Mill Rd.	$3,121,096	3
N339	SR 273 & Airport Rd.	$3,019,053	4
N239	US 40 & SR 72 (Sunset Lake Rd./ Wrangle Hill Rd.)	$2,969,948	5
N217	US 13 & Bacon Ave.	$2,832,687	6
N483	SR 896 (S. College Ave.) & US 40 (Pulaski Hwy.)	$2,572,475	7
N660	SR 4 &SR 72	$2,570,511	8
N191	SR 7 & SR 58 (Churchmans Rd.)	$2,550,067	9
N192	SR 7 & SR 273	$2,439,957	10
N185	US 40 & SR 7	$2,385,351	11
N242	SR 4 & Salem Church Rd.	$2,381,123	12
N432T	Cleveland Ave. & Paper Mill Rd./ N. Chapel St.	$2,299,691	13
N422T	SR 2 & Cleveland Ave.	$2,295,031	14
N381	Old Baltimore Pk. & Salem Church Rd. (East)	$2,143,315	15
N182	SR 72 & Old Baltimore Pk.	$2,118,541	16
N423T	SR 273 & Main St.	$2,114,674	17
N393	US 40 & Porter Rd.	$2,088,326	18
N188	SR 896 & Old Baltiomore Pk.	$2,061,671	19
N101	US 202 & SR 92 (Naamans Rd.)	$1,824,704	20
N162	SR 2 & SR 41	$1,759,327	21
N312	SR 4 & Harmony Rd.	$1,755,071	22
N179	US 13 & Memorial Dr.	$1,712,892	23
	Market St & Front St.	$1,712,528	24
N362	SR 72 & Possum Park Rd.	$1,700,962	25

Severity

Figure 15: Crash Severity Ranking Map



The crash severity ranking of intersections were derived from the formula below. Given the damage concerning each crash at an intersection, the following numbers are plugged into the formula to calculate a "Severity Index". This helps to give an idea of the damages incurred at a particular crash site. Again you can see, many of the top intersections for this ranking system are the same as the previous two methods.

$$\textit{Severity Index} = 40K + 9A + 5B + 2C + O$$

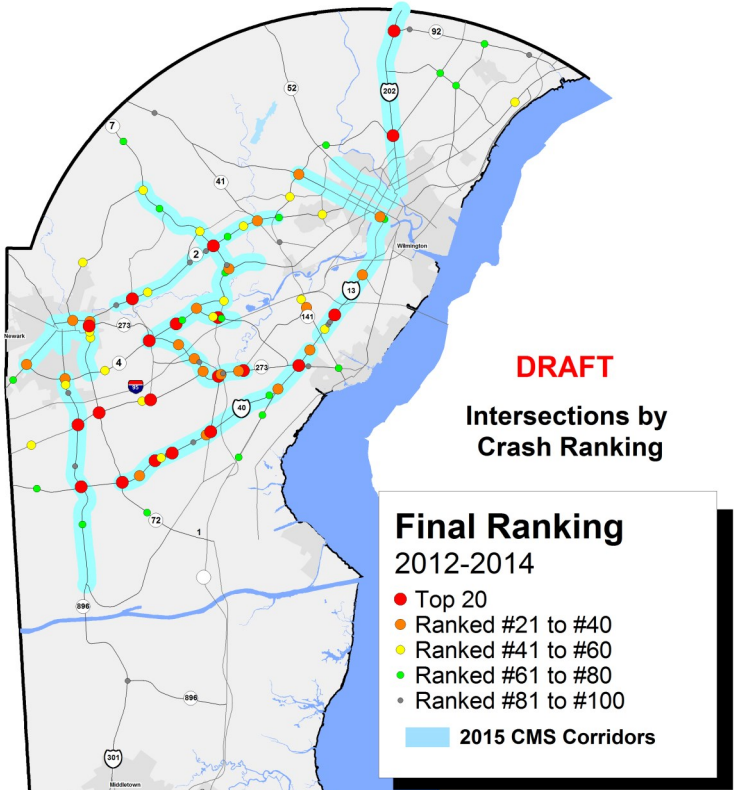
Where:
K = Fatality
A = Incapacitating Injury
B = Non-incapacitating injury
C = Possible Injury
O = Property Damage Only

Table 8: Top Locations in Crash Severity

PERMITNUM	Full_name	Severity Index (CSR)	CSR Rank
N217	US 13 & Bacon Ave.	286	1
N165	SR 2 (Kirkwood Hwy.) &SR 7 (Limestone Rd.)	276	2
N183	US 13 & SR 273	268	3
N339	SR 273 & Airport Rd.	221	4
N317	SR 2 (Kirkwood Hwy) & Red Mill Rd.	221	5
N423T	SR 273 & Main St.	213	6
N185	US 40 & SR 7	204	7
N192	SR 7 & SR 273	189	8
N191	SR 7 & SR 58 (Churchmans Rd.)	187	9
N660	SR 4 &SR 72	180	10
N483	SR 896 (S. College Ave.) & US 40 (Pulaski Hwy.)	176	11
N239	US 40 & SR 72 (Sunset Lake Rd./ Wrangle Hill Rd.)	171	12
N381	Old Baltimore Pk. & Salem Church Rd. (East)	163	13
N242	SR 4 & Salem Church Rd.	158	14
N312	SR 4 & Harmony Rd.	152	15
N552	US 40 & Church Rd.	152	16
N369	SR 4 & Churchmans Rd.	150	17
N184	US 13 & US 40	145	18
N337	SR 273 (Christiana Rd.) & Harmony Rd.	136	19
N179	US 13 & Memorial Dr.	133	20
N101	US 202 & SR 92 (Naamans Rd.)	131	21
N436T	SR 4 &SR 896 (S. College Ave)	131	22
N188	SR 896 & Old Baltiomore Pk.	130	23
N460	SR 273 & Appleby Rd.	127	24
N008P	US 13 & Greater Wilm. Airport	126	25

Final Scoring/Ranking

Figure 16: Final Ranking Map



The final rankings of each intersection were taken as the average of the previous three rankings. In the table below showing the top 25 intersections, this average is listed as "FS_Rank". Based on these averages the intersections are ordered from least to greatest and then ranked from 1-25.

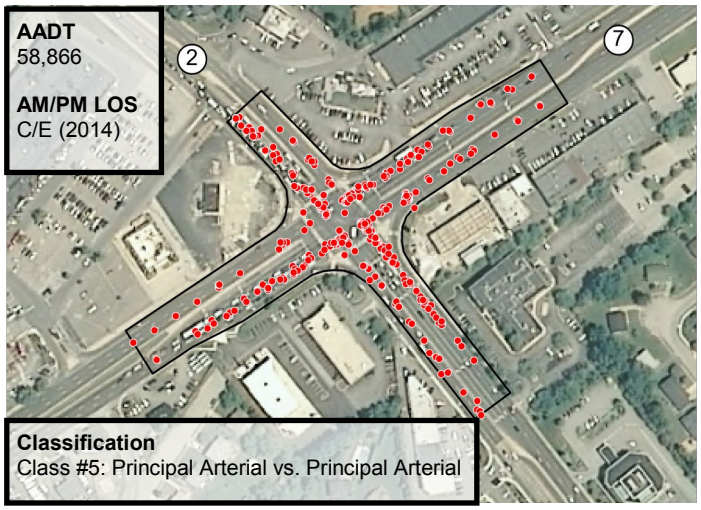
$$FS\_Rank = (CFR + CCR + CSR)/3$$

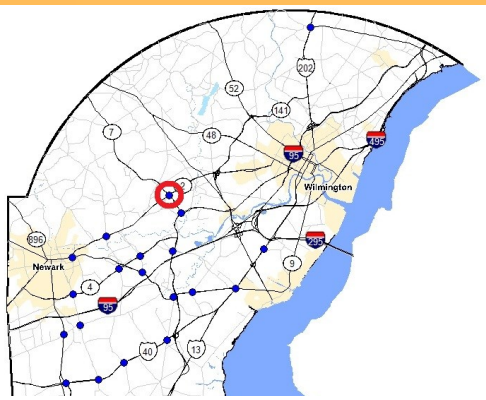
As you can see, the top most dangerous intersctions (in accordance with this method) are Kirkwood Highway (SR2) and Limestone Road (SR 7), US 13 and SR 273 and US 13 and Bacon Avenue.

Table 9: Top Crash Locations

PERMITNUM	Full_name	FS Rank	Final Rank
N165	SR 2 (Kirkwood Hwy.) &SR 7 (Limestone Rd.)	1.3	1
N183	US 13 & SR 273	2.3	2
N217	US 13 & Bacon Ave.	3.3	3
N317	SR 2 (Kirkwood Hwy) & Red Mill Rd.	5.3	4
N339	SR 273 & Airport Rd.	7.0	5
N191	SR 7 & SR 58 (Churchmans Rd.)	7.3	6
N192	SR 7 & SR 273	7.7	7
N185	US 40 & SR 7	8.0	8
N660	SR 4 &SR 72	8.3	9
N483	SR 896 (S. College Ave.) & US 40 (Pulaski Hwy.)	9.3	10
N239	US 40 & SR 72 (Sunset Lake Rd./ Wrangle Hill Rd.)	9.3	11
N242	SR 4 & Salem Church Rd.	11.7	12
N423T	SR 273 & Main St.	12.7	13
N381	Old Baltimore Pk. & Salem Church Rd. (East)	16.3	14
N188	SR 896 & Old Baltiomore Pk.	18.0	15
N101	US 202 & SR 92 (Naamans Rd.)	19.0	16
N312	SR 4 & Harmony Rd.	20.0	17
N393	US 40 & Porter Rd.	22.0	18
N552	US 40 & Church Rd.	22.3	19
N182	SR 72 & Old Baltimore Pk.	22.7	20
N184	US 13 & US 40	23.0	21
N432T	Cleveland Ave. & Paper Mill Rd./ N. Chapel St.	23.0	22
N369	SR 4 & Churchmans Rd.	23.3	23
N337	SR 273 (Christiana Rd.) & Harmony Rd.	24.0	24
N422T	SR 2 & Cleveland Ave.	25.0	25

SR 2 (Kirkwood Highway) & SR 7 (Limestone Road)





The intersection of SR 2 & SR 7 has the current highest three-year crash average, with an average of 72 crashes per year for 2012-2014.
As the intersection of two principal arterials, it sees nearly 59,000 vehicles per day approach it.

Figure 17: Average Annual Crashes

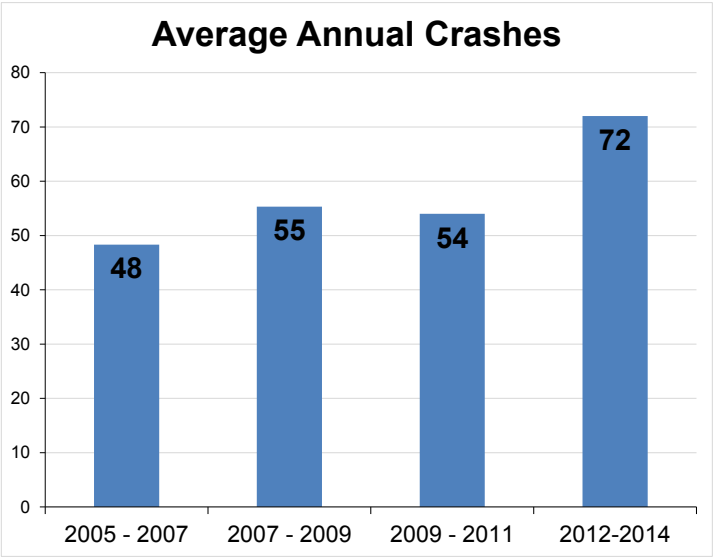


Table 10: Manner of Impact (Cost)

Crash Impact Type	#	Average Cost
Single Vehicle Crash	9	$59,428
Front to Rear	130	$12,163
Front to Front	6	$81,100
Angle	38	$34,477
Sideswipe (Same Direction)	28	$8,817
Sideswipe (Opposite Direction)	2	$17,141
Rear to Side	0	$3,151
Rear to rear	0	$3,151
Other & Unknown	3	$38,868
	Total:	$4,310,530

Table 11: Crash Severity

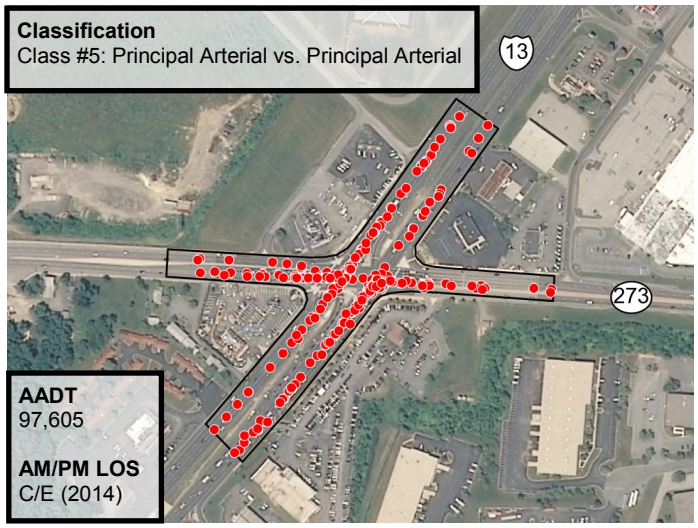
Severity (12-14)	#	
K	0	0
A	1	9
B	17	85
C	4	8
O	174	174
Severity Index	**Total:**	276

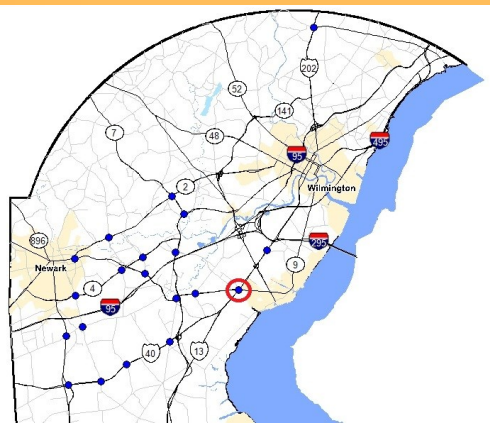
$$FS\_Rank = (CFR + CCR + CSR)/3$$

$$FS\_Rank = (1 + 1 + 2)/3 = 1.3$$

$$Final\ Rank = 1$$

US 13 & SR 273





The intersection of US 13 & SR 273 has the current second-highest three-year crash average, with an average of 60 crashes per year for 2012-2014.
Though it has had fewer crashes than SR 2 & SR 7, just under 100,000 vehicles approach the intersection each day.

Figure 18: Average Annual Crashes

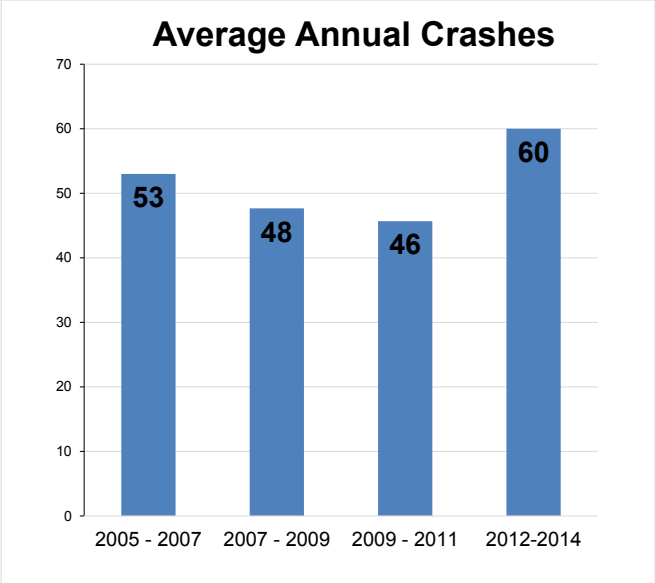


Table 12: Crash Impact Type

Crash Impact Type	#	Average Cost
Single Vehicle Crash	13	$59,428
Front to Rear	100	$12,163
Front to Front	2	$81,100
Angle	28	$34,477
Sideswipe (Same Direction)	29	$8,817
Sideswipe (Opposite Direction)	12	$17,141
Rear to Side	0	$3,151
Rear to rear	1	$3,151
Other & Unknown	5	$38,868
	Total:	$3,586,745

Table 13: Crash Severity

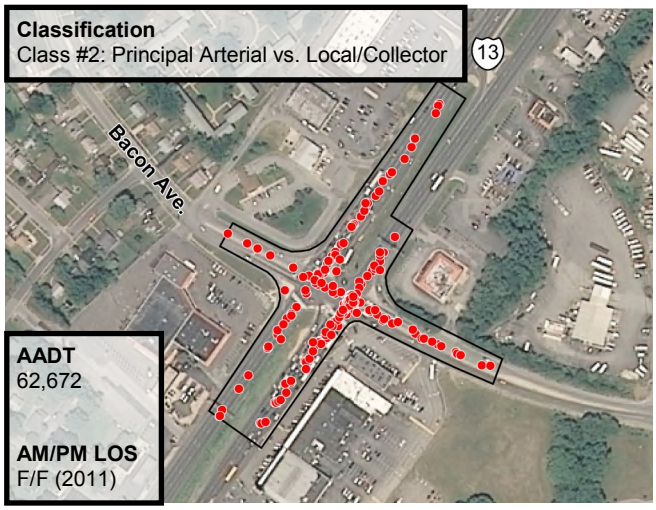
Severity (12-14)	#	
K	0	0
A	6	54
B	13	65
C	1	2
O	147	147
Severity Index	**Total:**	268

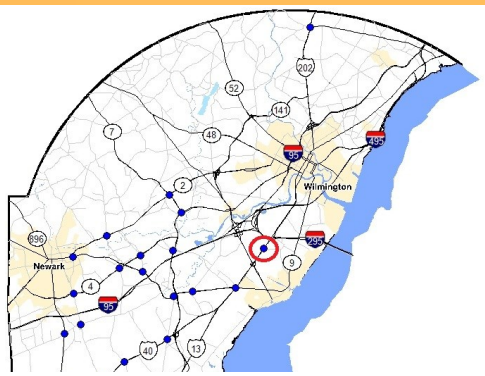
$$FS\_Rank = (CFR + CCR + CSR)/3$$

$$FS\_Rank = (2 + 2 + 3)/3 = 2.3$$

$$Final\ Rank = 2$$

US 13 & Bacon Avenue





The intersection of US 13 & Bacon Ave. holds the highest crash severity ranking, with a severity index of 286. Though it is the only intersection in the top ten to include a local or collector road, over 62,000 vehicles approach the intersection daily.

Figure 19: Average Annual Crashes

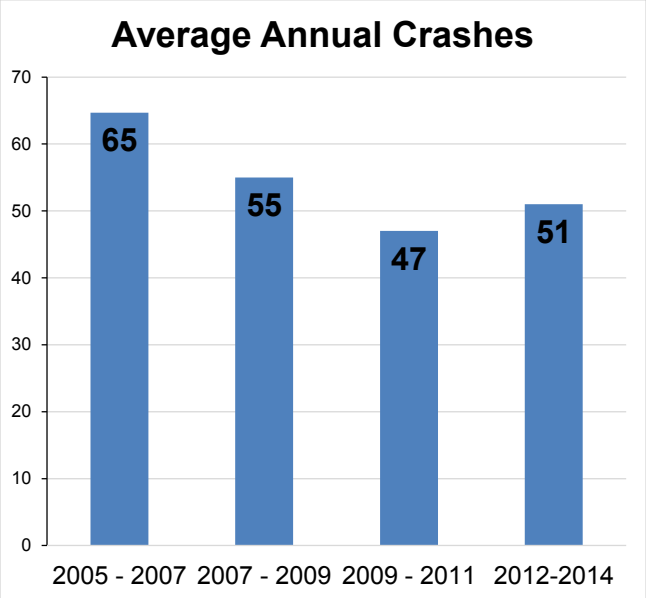


Table 14: Crash Impact Type

Crash Impact Type	#	Average Cost
Single Vehicle Crash	3	$59,428
Front to Rear	90	$12,163
Front to Front	1	$81,100
Angle	30	$34,477
Sideswipe (Same Direction)	22	$8,817
Sideswipe (Opposite Direction)	1	$17,141
Rear to Side	0	$3,151
Rear to rear	0	$3,151
Other & Unknown	6	$38,868
	Total:	$2,832,687

Table 15: Crash Severity

Severity (12-14)	#	
K	2	80
A	0	0
B	12	60
C	12	24
O	122	122
Severity Index	**Total:**	286

$$FS\_Rank = (CFR + CCR + CSR)/3$$

$$FS\_Rank = (3 + 6 + 1)/3 = 3.3$$

$$Final\ Rank = 3$$

SR 2 (Kirkwood Highway) & Red Mill Road

Figure 20: Average Annual Crashes

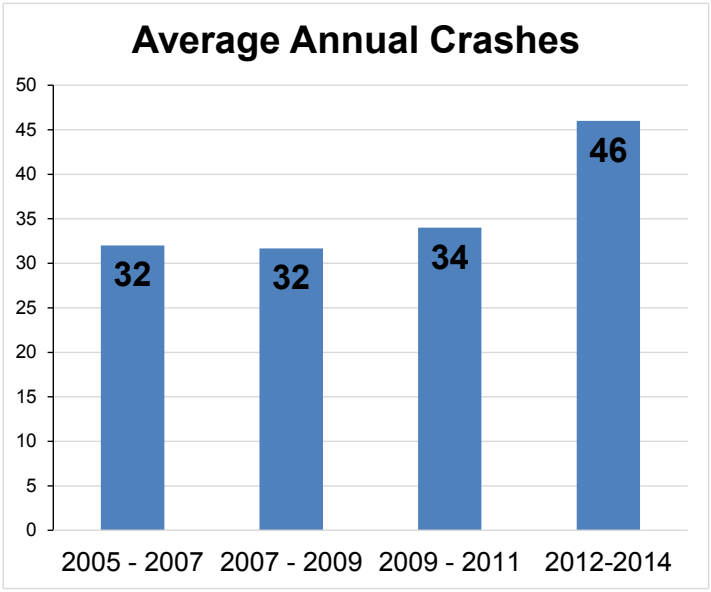
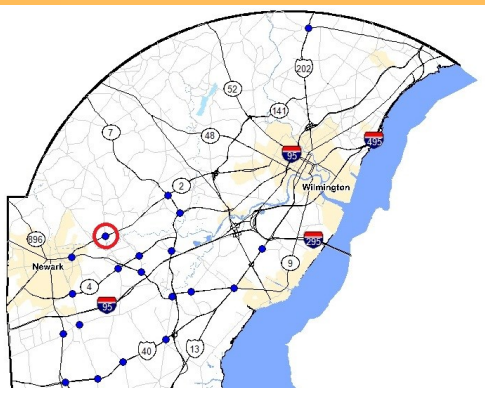


Table 17: Crash Severity

Severity (12-14)	#	
K	1	40
A	1	9
B	10	50
C	3	6
O	116	116
Severity Index	**Total:**	221



The intersection of SR 2 & Red Mill Road holds the crash impact (cost) average, with an average cost of $3,121,096 for 2012-2014.
As the intersection of a principal arterial and a minor arterial, it sees almost 49,000 vehicles approach it daily.

Table 16: Crash Impact Type

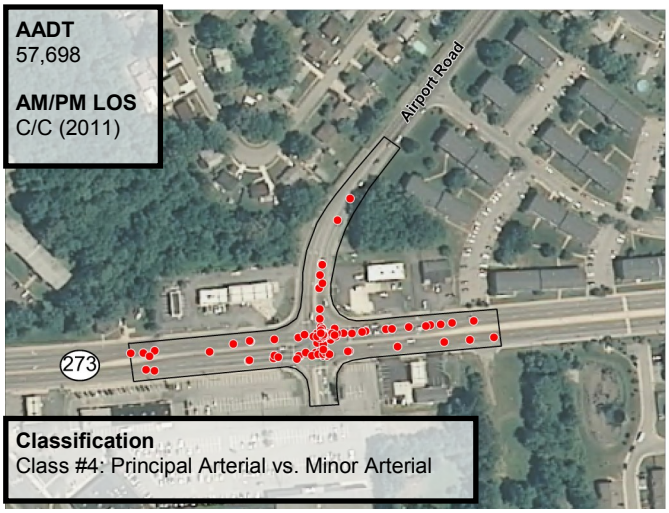
Crash Impact Type	#	Average Cost
Single Vehicle Crash	8	$59,428
Front to Rear	78	$12,163
Front to Front	5	$81,100
Angle	28	$34,477
Sideswipe (Same Direction)	13	$8,817
Sideswipe (Opposite Direction)	1	$17,141
Rear to Side	0	$3,151
Rear to rear	0	$3,151
Other & Unknown	5	$38,868
	Total:	$3,121,096

$$FS\_Rank = (CFR + CCR + CSR)/3$$

$$FS\_Rank = (8 + 5 + 5)/3 = 5.3$$

$$Final\ Rank = 4$$

SR 273 & Airport Road



The intersection of SR 273 & Airport Road holds the fourth-highest severity ranking, with a severity index of 221 for 2012-2014.
As the intersection of a principal arterial and a minor arterial, it sees nearly 58,000 vehicles approach it each day.

Figure 21: Average Annual Crashes

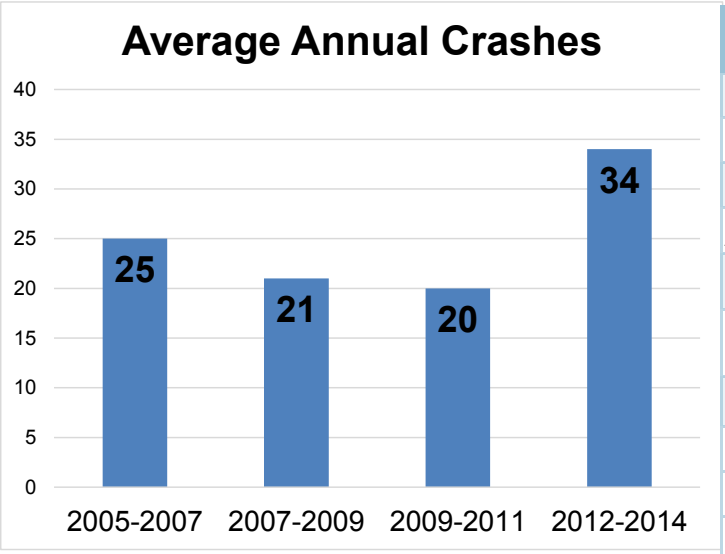


Table 18: Crash Impact Type

Crash Impact Type	#	Average Cost
Single Vehicle Crash	3	$59,428
Front to Rear	28	$12,163
Front to Front	9	$81,100
Angle	46	$34,477
Sideswipe (Same Direction)	14	$8,817
Sideswipe (Opposite Direction)	0	$17,141
Rear to Side	0	$3,151
Rear to rear	7	$3,151
Other & Unknown	1	$38,868
	Total:	$3,019,053

Table 19: Crash Severity

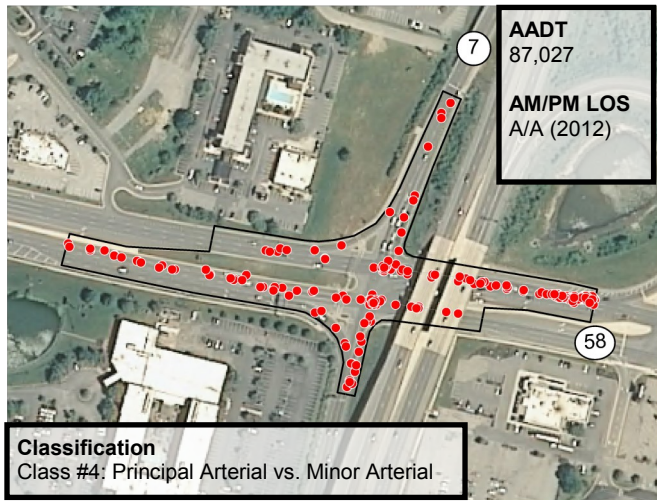
Severity (12-14)	#	
K	0	0
A	7	63
B	14	70
C	10	20
O	68	68
Severity Index	**Total:**	221

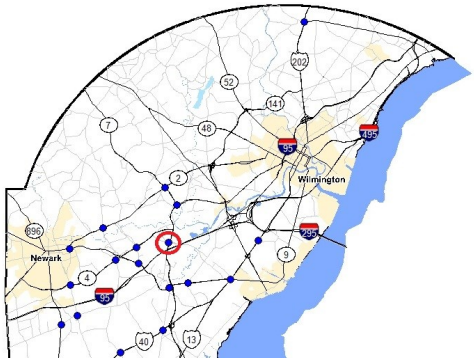
$$FS\_Rank = (CFR + CCR + CSR)/3$$

$$FS\_Rank = (13 + 4 + 4)/3 = 7$$

$$Final\ Rank = 5$$

SR 7 & SR 58 (Churchman's Road)





The intersection of SR 7 & SR 58 has the fourth-highest three-year crash average, with an average of 50 crashes per year for 2012-2014.

As the intersection of a principal arterial and a minor arterial, it is one of the most travelled intersection on the list, with over 87,000 vehicles approaching daily.

Figure 22: Average Annual Crashes

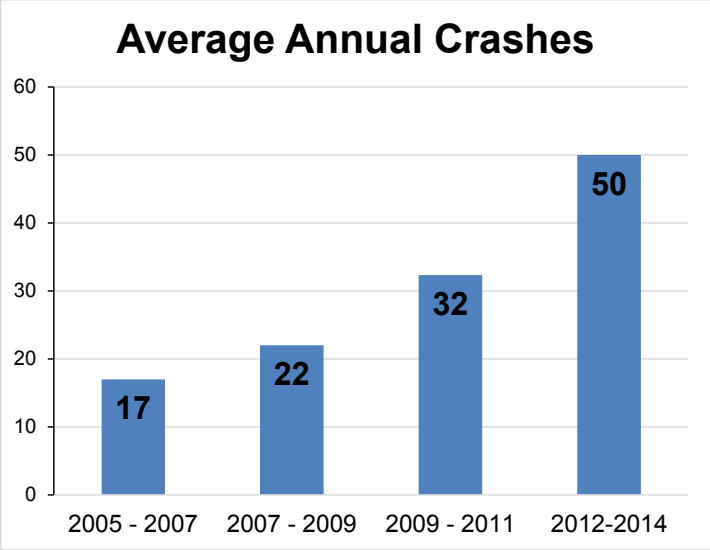


Table 20: Crash Impact Type

Crash Impact Type	#	Average Cost
Single Vehicle Crash	2	$59,428
Front to Rear	104	$12,163
Front to Front	1	$81,100
Angle	26	$34,477
Sideswipe (Same Direction)	17	$8,817
Sideswipe (Opposite Direction)	0	$17,141
Rear to Side	0	$3,151
Rear to rear	0	$3,151
Other & Unknown	1	$38,868
	Total:	$2,550,067

Table 21: Crash Severity

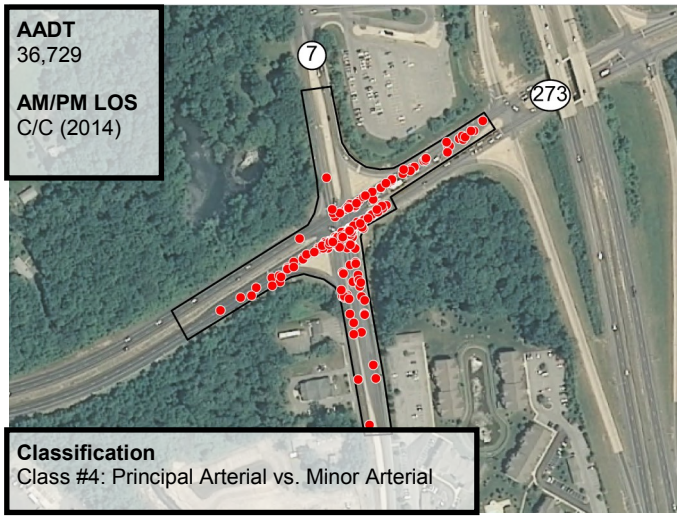
Severity (12-14)	#	
K	0	0
A	0	0
B	10	50
C	4	8
O	129	129
Severity Index	**Total:**	187

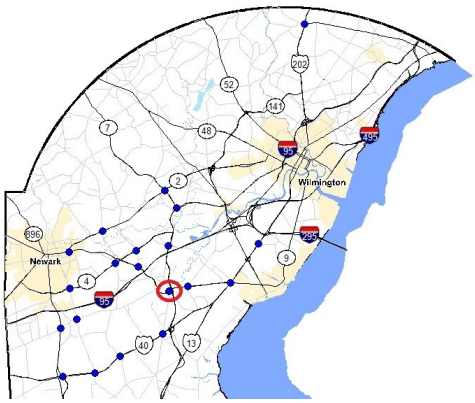
$$FS\_Rank = (CFR + CCR + CSR)/3$$

$$FS\_Rank = (4 + 9 + 9)/3 = 7.3$$

$$Final\ Rank = 6$$

SR 7 & SR 273





The intersection of SR 7 & SR 273 has the fifth-highest three-year crash average, with an average of 47 crashes per year for 2011-2013.
Despite its high crash average, fewer than 37,000 vehicles approach the intersection daily.

Figure 23: Average Annual Crashes

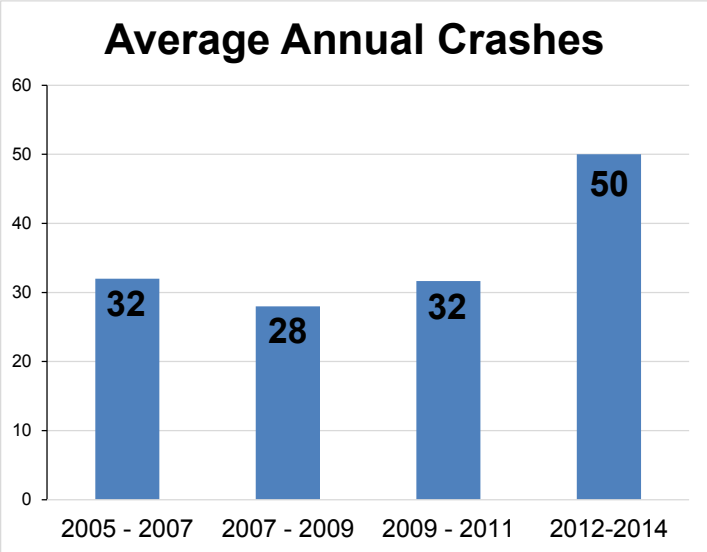


Table 22: Crash Impact Type

Crash Impact Type	#	Average Cost
Single Vehicle Crash	6	$59,428
Front to Rear	113	$12,163
Front to Front	2	$81,100
Angle	11	$34,477
Sideswipe (Same Direction)	19	$8,817
Sideswipe (Opposite Direction)	0	$17,141
Rear to Side	0	$3,151
Rear to rear	0	$3,151
Other & Unknown	0	$38,868
	Total:	$2,439,957

Table 23: Crash Severity

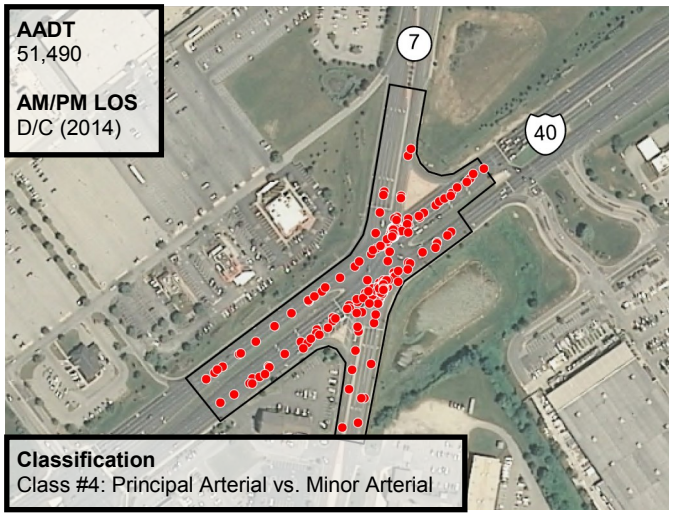
Severity (12-14)	#	
K	0	0
A	1	9
B	7	35
C	7	14
O	131	131
Severity Index	**Total:**	189

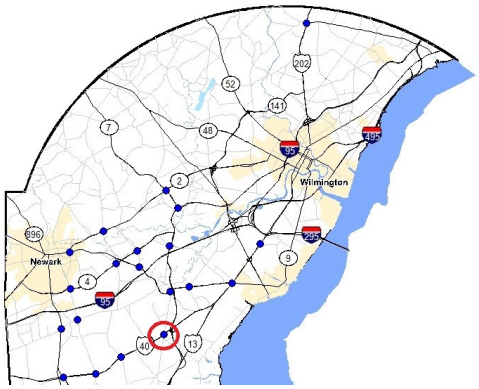
$$FS\_Rank = (CFR + CCR + CSR)/3$$

$$FS\_Rank = (5 + 10 + 8)/3 = 7.7$$

$$Final\ Rank = 7$$

US 40 & SR 7





The intersection of US 40 & SR 7 has the sixth-highest three-year crash average, with an average of 50 crashes per year for 2012-2014.
As the intersection of a principal arterial and a minor arterial, it sees over 51,000 vehicles approach it each day.

Figure 24: Average Annual Crashes

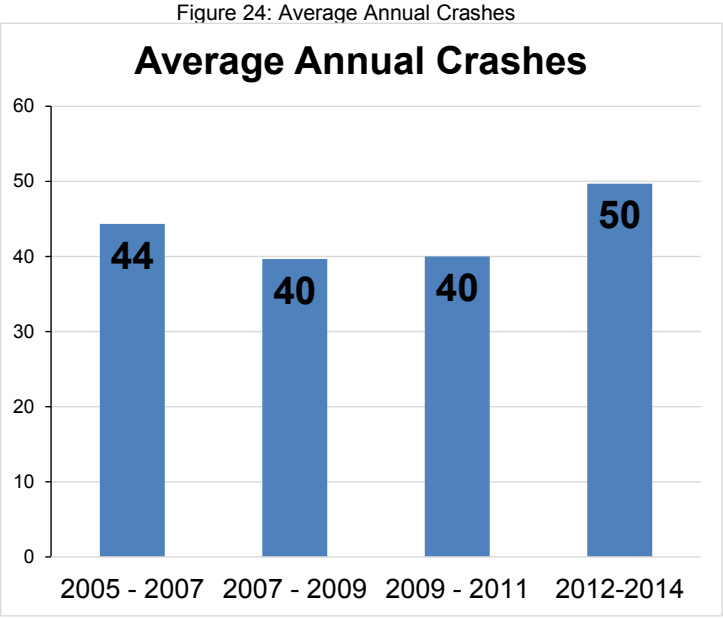


Table 24: Crash Impact Type

Crash Impact Type	#	Average Cost
Single Vehicle Crash	4	$59,428
Front to Rear	122	$12,163
Front to Front	3	$81,100
Angle	6	$34,477
Sideswipe (Same Direction)	11	$8,817
Sideswipe (Opposite Direction)	0	$17,141
Rear to Side	0	$3,151
Rear to rear	0	$3,151
Other & Unknown	3	$38,868
	Total:	$2,385,351

Table 25: Crash Severity

Severity (12-14)	#	
K	0	0
A	2	18
B	10	50
C	7	14
O	122	122
Severity Index	**Total:**	204

$$FS\_Rank = (CFR + CCR + CSR)/3$$

$$FS\_Rank = (6 + 11 + 7)/3 = 8$$

$$Final\ Rank = 8$$

SR 4 & SR 72

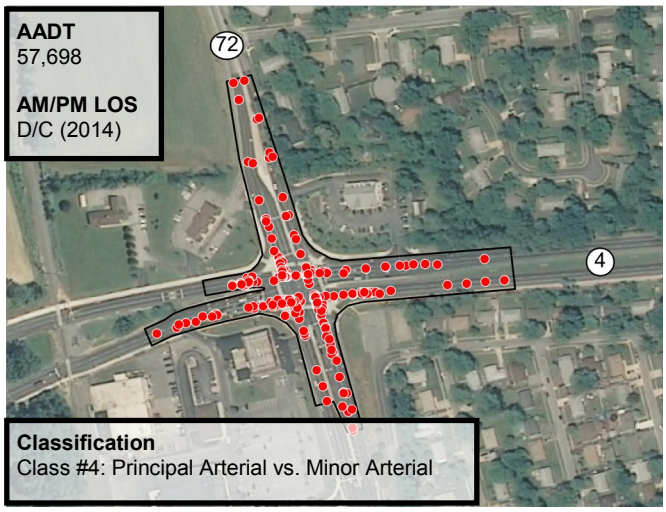
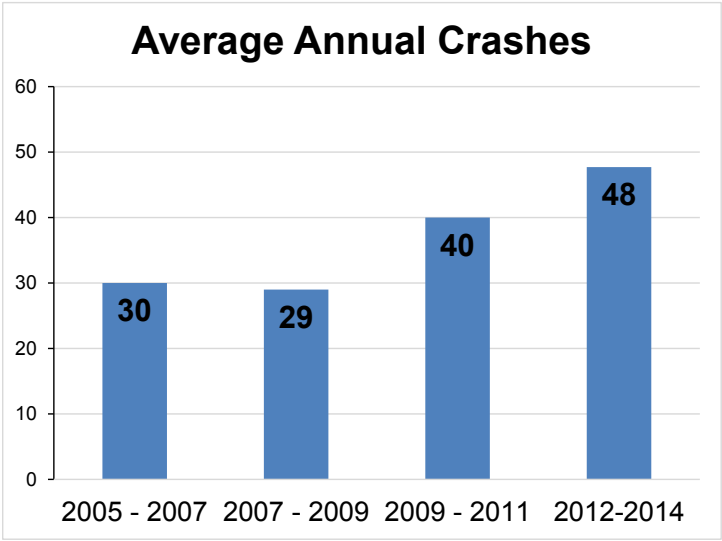
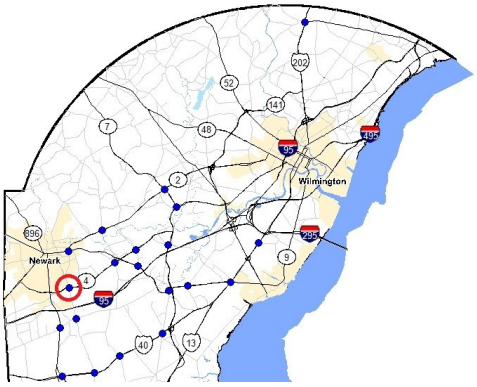


Figure 25: Average Annual Crashes





The intersection of SR 4 & SR 72 has the seventh-highest three-year crash average, with an average of 48 crashes per year for 2012-2014.
As the intersection of a principal arterial and a minor arterial, it sees nearly 58,000 vehicles approach it each day.

Table 26: Crash Impact Type

Crash Impact Type	#	Average Cost
Single Vehicle Crash	5	$59,428
Front to Rear	95	$12,163
Front to Front	1	$81,100
Angle	25	$34,477
Sideswipe (Same Direction)	14	$8,817
Sideswipe (Opposite Direction)	3	$17,141
Rear to Side	0	$3,151
Rear to rear	0	$3,151
Other & Unknown	0	$38,868
	Total:	$2,570,511

Table 27: Crash Severity

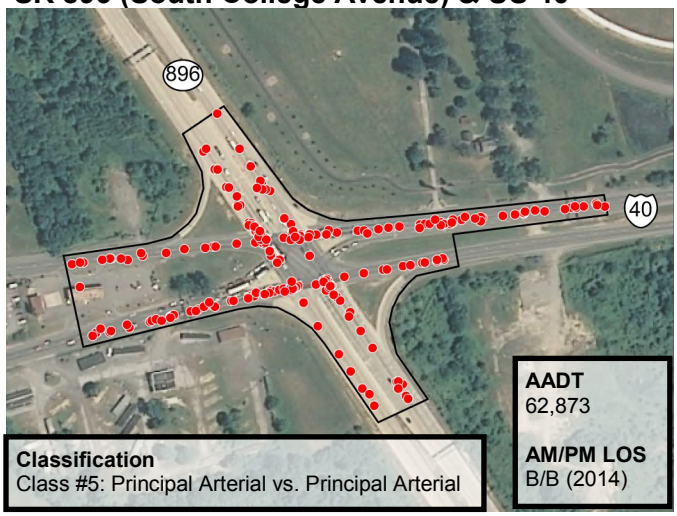
Severity (12-14)	#	
K	0	0
A	3	27
B	5	25
C	0	0
O	128	128
Severity Index	**Total:**	180

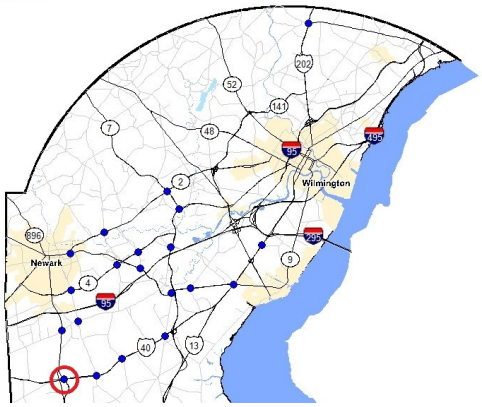
$$FS\_Rank = (CFR + CCR + CSR)/3$$

$$FS\_Rank = (7 + 8 + 10)/3 = 8.3$$

$$Final\ Rank = 9$$

SR 896 (South College Avenue) & US 40





The intersection of SR 896 & US 40 holds the seventh-highest crash impact cost average, with an average cost of $2,572,475 crashes for 2012-2014.
As the intersection of two principal arterials, it sees nearly 63,000 vehicles approach it each day.

Figure 26: Average Annual Crashes

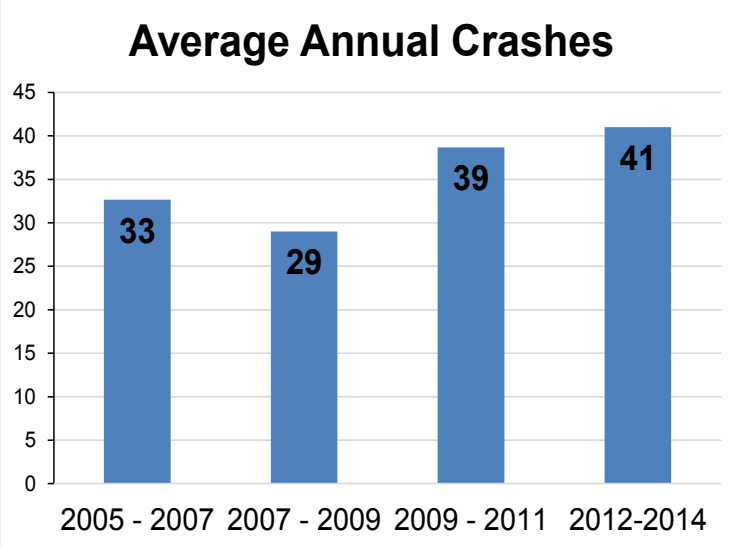


Table 28: Crash Impact Type

Crash Impact Type	#	Average Cost
Single Vehicle Crash	5	$59,428
Front to Rear	64	$12,163
Front to Front	4	$81,100
Angle	25	$34,477
Sideswipe (Same Direction)	22	$8,817
Sideswipe (Opposite Direction)	0	$17,141
Rear to Side	0	$3,151
Rear to rear	0	$3,151
Other & Unknown	3	$38,868
	Total:	$2,572,475

Table 29: Crash Severity

Severity (12-14)	#	
K	0	0
A	1	9
B	11	55
C	8	16
O	96	96
Severity Index	**Total:**	176

$$FS\_Rank = (CFR + CCR + CSR)/3$$

$$FS\_Rank = (10 + 7 + 11)/3 = 9.3$$

$$Final\ Rank = 10$$

Crash Data Sources

Crash analyses for this report have been conducted using two main sources of data:

- Delaware State Police, Office of Traffic Control, which collect and tabulate all traffic crash reports for annual compilations, and
- Maryland State Highway, Office of Traffic and Safety, which runs Maryland's highway traffic safety program and complies annual reports of crash statistics.

These sources have provided the general county-wide statistical data for total crashes, personal injuries, fatalities, pedestrian, and bicycle. This information was tabulated for the WILMAPCO region and represented in easily understood formats of tables and graphs.

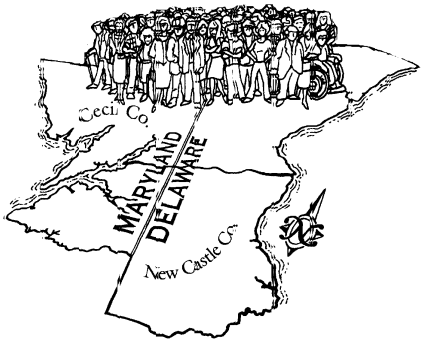
To look more specifically at trends in crash data, particularly along road segments, WILMAPCO and DelDOT have complied several Geographic Information System (GIS) files of all reported crashes and associated attribute data for calendar years 2005 to 2013 using the raw data from the Delaware State Police. This information is represented in map form as well as tables.

A combination of two GIS files were used to conduct the various analyses for New Castle County:

- Intersection Crashes – This consists of all crashes within intersection buffer, including annual totals for pedestrian, bicycle, and truck crashes at intersections.
- Crashes by Point –This table provided a more detailed review of the geographic location of each crash.

This type of detailed analysis is only applicable to New Castle because Cecil County data is not yet available in a format that can be used to conduct a full crash analysis. When Cecil data becomes available, a detailed road segment analysis will be conducted.

The Wilmington Area Planning Council (WILMAPCO) is a Metropolitan Planning Organization serving New Castle County, DE and Cecil County, MD. Our mission is to serve the citizens and stakeholders of the region by carrying out a comprehensive, continuing and cooperative regional transportation planning process consistent with federal transportation legislation. This series of data reports is designed to summarize various data and information about our region to allow decision makers and members of the public to better understand the changes within our region. This document was created by the WILMAPCO Demographics and Data Subcommittee. For more information on this and other data reports, please visit our website at http://www.wilmapco.org/data/index.htm.



Other WILMAPCO Data Reports can be accessed at
http://www.wilmapco.org/data-reports/

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