

### 3.9 Safety

Safety is a key component of transportation planning. One of the most critical goals established for the OMEGA RTPO is to improve the safety of the transportation systems. To identify and document existing safety issues or areas of concern in the eight-county planning area, OMEGA used the GIS Crash Analysis Tool (GCAT). GCAT contains crash data from 2008 to part of 2014. For the purposes of this study, a three-year period, 2011 to 2013 was selected for analysis.

#### 3.9.1 Crash Summaries

As shown in Table 3-10, for the period between 2011 and 2013, there were 30,113 crashes in the eight-county planning area, an increase of almost 2% (190 more crashes). The total number of crashes in Guernsey, Harrison, and Tuscarawas Counties increased significantly over this period. The number of crashes increased by 5.75% (65 more crashes) in Guernsey County, over 24% (72 more crashes) in Harrison County, and by over 10% in Tuscarawas County (227 more crashes). Coshocton County experienced a dramatic decrease in the total number of crashes by almost 35% (176 fewer crashes). Crashes in Holmes County decreased by almost 5% and the total number of crashes in Muskingum County showed a modest decrease of 0.5%. The total number of crashes in Carroll and Columbiana Counties increased by approximately 2%.

**Table 3-10: Crash Summary**

County	2011	2012	2013	Total	Change 2011 to 2013
Carroll	457	493	465	1,415	1.75%
Columbiana	2,051	2,042	2,095	6,188	2.15%
Coshocton	504	418	328	1,250	-34.92%
Guernsey	1,130	1,242	1,195	3,567	5.75%
Harrison	295	321	367	983	24.41%
Holmes	775	754	737	2,266	-4.90%
Muskingum	2,473	2,464	2,461	7,398	-0.49%
Tuscarawas	2,228	2,363	2,455	7,046	10.19%
<b>Total</b>	<b>9,913</b>	<b>10,097</b>	<b>10,103</b>	<b>30,113</b>	<b>1.92%</b>

Source: ODOT GCAT 2011 to 2013

A detailed summary of these accidents is provided in Table 3-11. As shown in Table 3-11, the five most common types of accidents in the OMEGA RTPO planning area are:

- Fixed Object: 29%
- Rear End: 17%
- Animal: 15%
- Angle: 11.5%
- Sideswipe: 9.5%

**Table 3-11: Accident Summary by Type**

	Carroll		Columbiana		Coshocton		Guernsey		Harrison	
Row Labels	Count	Percentage of County	Count	Percentage of County	Count	Percentage of County	Count	Percentage of County	Count	Percentage of County
Angle	117	8.27%	836	13.51%	156	12.48%	322	9.03%	56	5.70%
Animal	130	9.19%	871	14.08%	214	17.12%	719	20.16%	133	13.53%
Backing	39	2.76%	248	4.01%	71	5.68%	127	3.56%	38	3.87%
Fixed Object	592	41.84%	1928	31.16%	383	30.64%	1054	29.55%	414	42.12%
Head On	13	0.92%	53	0.86%	12	0.96%	28	0.78%	16	1.63%
Left Turn	25	1.77%	127	2.05%	17	1.36%	54	1.51%	17	1.73%
Other Non-Collision	29	2.05%	127	2.05%	12	0.96%	104	2.92%	21	2.14%
Other Non-Vehicle	0	0.00%	0	0.00%	0	0.00%	1	0.03%	0	0.00%
Other Object	23	1.63%	70	1.13%	5	0.40%	81	2.27%	4	0.41%
Overturning	68	4.81%	106	1.71%	32	2.56%	66	1.85%	44	4.48%
Parked Vehicle	41	2.90%	258	4.17%	55	4.40%	141	3.95%	36	3.66%
Pedalcycles	0	0.00%	11	0.18%	3	0.24%	6	0.17%	1	0.10%
Pedestrian	4	0.28%	26	0.42%	7	0.56%	19	0.53%	4	0.41%
Rear End	204	14.42%	1016	16.42%	178	14.24%	461	12.92%	87	8.85%
Sideswipe - Meeting	78	5.51%	245	3.96%	45	3.60%	112	3.14%	76	7.73%
Sideswipe - Passing	32	2.26%	234	3.78%	56	4.48%	245	6.87%	28	2.85%
Train	1	0.07%	2	0.03%	0	0.00%	1	0.03%	2	0.20%
Unknown	19	1.34%	30	0.48%	4	0.32%	26	0.73%	6	0.61%
<b>Total</b>	<b>1415</b>	<b>100.00%</b>	<b>6188</b>	<b>100.00%</b>	<b>1250</b>	<b>100.00%</b>	<b>3567</b>	<b>100.00%</b>	<b>983</b>	<b>100.00%</b>

Source: ODOT 2011 to 2013

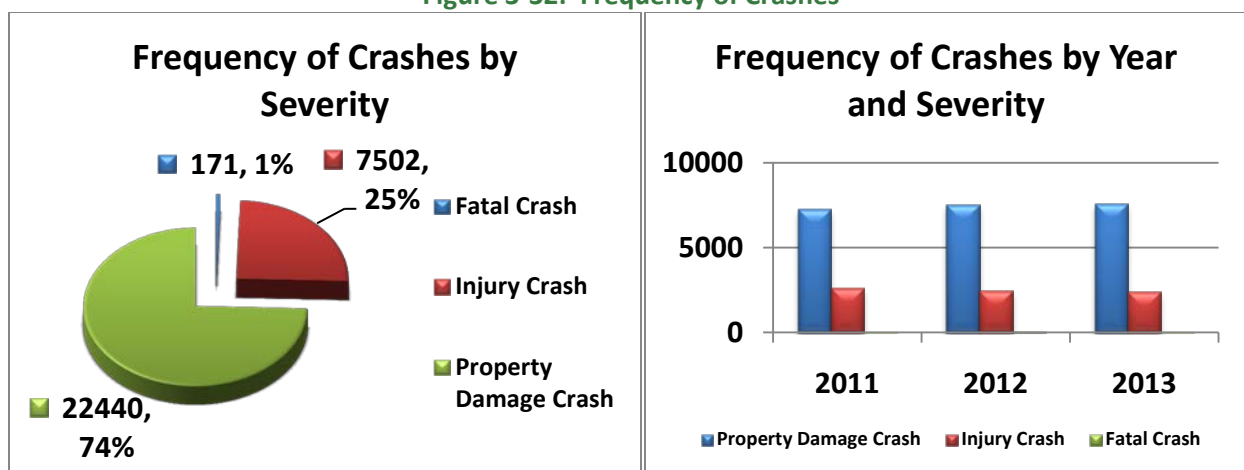
	Holmes		Muskingum		Tuscarawas		Total	
Row Labels	Count	Percentage of County	Count	Percentage of County	Count	Percentage of County	Count	Percentage of Total
Angle	247	10.90%	937	12.67%	787	11.17%	3458	11.48%
Animal	293	12.93%	917	12.40%	1349	19.15%	4626	15.36%
Backing	73	3.22%	246	3.33%	325	4.61%	1167	3.88%
Fixed Object	803	35.44%	1698	22.95%	1738	24.67%	8610	28.59%
Head On	13	0.57%	54	0.73%	46	0.65%	235	0.78%
Left Turn	35	1.54%	286	3.87%	163	2.31%	724	2.40%
Other Non-Collision	42	1.85%	141	1.91%	151	2.14%	627	2.08%
Other Non-Vehicle	0	0.00%	0	0.00%	3	0.04%	4	0.01%
Other Object	25	1.10%	83	1.12%	121	1.72%	412	1.37%
Overturning	55	2.43%	102	1.38%	115	1.63%	588	1.95%
Parked Vehicle	50	2.21%	362	4.89%	270	3.83%	1213	4.03%
Pedalcycles	17	0.75%	21	0.28%	37	0.53%	96	0.32%
Pedestrian	4	0.18%	35	0.47%	25	0.35%	124	0.41%
Rear End	366	16.15%	1603	21.67%	1274	18.08%	5189	17.23%
Sideswipe - Meeting	142	6.27%	251	3.39%	192	2.72%	1141	3.79%
Sideswipe - Passing	84	3.71%	626	8.46%	427	6.06%	1732	5.75%
Train		0.00%	2	0.03%	2	0.03%	10	0.03%
Unknown	17	0.75%	34	0.46%	21	0.30%	157	0.52%
<b>Total</b>	<b>2266</b>	<b>100.00%</b>	<b>7398</b>	<b>100.00%</b>	<b>7046</b>	<b>100.00%</b>	<b>30113</b>	<b>100.00%</b>

Source: ODOT 2011 to 2013

### 3.9.2 Crash Severity – Fatalities, Injuries and Property Damage

Of the 30,113 crashes in the OMEGA RTPo planning area, 7,502 resulted in injuries and 171 resulted in fatalities (see Figure 3-32 and Table 3-12). The average rate of injury for all crashes is 24.9% and the average rate of fatality for all crashes is 0.56%. Although the highest number of fatalities were in Columbiana County (Table 3-12), the rate of fatality in that county is 0.61%. While only 3.26% of all crashes occur in Harrison County, 1.52% of those crashes resulted in fatalities. Appendix I contains county maps that show the fatal accidents displayed to show the number of fatalities per accident. Appendix J1 contains county based heat maps showing areas where there are accidents with fatalities or injuries.

**Figure 3-32: Frequency of Crashes**



Source: ODOT GCAT 2011 to 2013

**Table 3-12: Crash Severity**

	Fatal Crashes		Injury Crashes		Property Damage Crashes		Total Crashes	
	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
Carroll	9	5.26%	400	5.33%	1006	4.48%	1415	4.70%
Columbiana	38	22.22%	1668	22.23%	4482	19.97%	6188	20.55%
Coshocton	18	10.53%	275	3.67%	957	4.26%	1250	4.15%
Guernsey	18	10.53%	829	11.05%	2720	12.12%	3567	11.85%
Harrison	15	8.77%	298	3.97%	670	2.99%	983	3.26%
Holmes	17	9.94%	629	8.38%	1620	7.22%	2266	7.52%
Muskingum	30	17.54%	1728	23.03%	5640	25.13%	7398	24.57%
Tuscarawas	26	15.20%	1675	22.33%	5345	23.82%	7046	23.40%
<b>Total</b>	<b>171</b>	<b>100.00%</b>	<b>7502</b>	<b>100.00%</b>	<b>22440</b>	<b>100.00%</b>	<b>30113</b>	<b>100.00%</b>

Source: ODOT 2011-2013

### 3.9.3 High Risk Rural Roads

ODOT maintains a list of high-risk rural roads throughout the state covering five years of crash data. At this time the data covers 2008-2012. Segments of roads are studied based on several factors that are

determined by ODOT. This formulaic process results in the identification of high risk rural roads. ODOT further identifies the 100 segments of local roads with the highest risk and the 100 segments of state roads with the highest risk. Appendix K contains the maps produced by ODOT indicating the high-risk rural roads. Note that the years of crash data differs from the years of data used by OMEGA. Because of this, it is possible to have high-risk rural roads that do not indicate crashes on the OMEGA maps.

The High Risk Rural Roads are calculated using a formula. Multiple variables are loaded into the formula. The beginning log point, the ending log point are inserted to get the length of the road. The number of fatalities and the number of incapacitating injuries are also inserted. The number of years the study covers as well as the ADT are also inserted. These variables are then calculated to get an injury rate by using the following formula:

$$((\text{Injuries} + \text{Fatalities}) \times 1,000,000) / ((\text{years} \times 365) \times \text{Length} \times \text{ADT})$$

This determines a value for the number of injuries per one million vehicles. Any roads with a value over the state average are classified a High Risk Rural Road.

State Average		Local Average	
Functional Class	Crash Rate	Functional Class	Crash Rate
Rural Major Collector	13.88	Rural Major Collector	7.88
Rural Minor Collector	17.04	Rural Minor Collector	11.15
Rural Local Road	17.04	Rural Local Road	4.46

The following roads have been identified as high risk rural roads by ODOT based upon data collected between 2008 and 2012.

#### Carroll County

- 40<sup>th</sup> Highest State System, SR 542 between Holly Road NW and Magnolia Corporation Line
- 46<sup>th</sup> Highest Local System, SR 171 between Avalon Rd and SR 43

#### Columbiana County

- 11<sup>th</sup> Highest State System, SR 172 between Stark County Line and US 30
- 16<sup>th</sup> Highest State System, SR 558 between SR 45 and Fairfield School Road
- 33<sup>rd</sup> Highest State System, SR 172 between Rochester Road and US 30
- 56<sup>th</sup> Highest State System, SR 517 between Lisbon Corporation Line and SR 7
- 5<sup>th</sup> Highest State System, Cameron Rd between County Airport Road and McIntosh Road
- 29<sup>th</sup> Highest State System, Lower Elkton Road between half a mile south of Crestview Road and half a mile north of Kelly Park Road
- 49<sup>th</sup> Highest State System, Scotts Mill Road between Taylor Road and SR 154
- 66<sup>th</sup> Highest State System, Dyke Road between Yeagar Road and one half mile west of Jackson Street
- 70<sup>th</sup> Highest State System, Roller Coaster Road between Lincoln Highway and one half mile northwest of Guy Road

### **Coshocton County**

- 13<sup>th</sup> Highest Local System, CR 271 between one half mile south of Township 278 Road and one half mile north of County 429 Road
- 38<sup>th</sup> Highest Local System, Welker Drive

### **Guernsey County**

No road segments in the top 100 local or top 100 state lists

### **Harrison County**

- 10<sup>th</sup> Highest Local System, Toot Road between Mattern Road and SR 9
- 27<sup>th</sup> Highest Local System, Rose Valley Road between Lamborn Road and Unionvale Kenwood Road
- 53<sup>rd</sup> Highest Local System, Dennison Avenue between US 250 and Sheridan Avenue
- 83<sup>rd</sup> Highest Local System, Old Jewett Road between New Rumley Road and Scott Road

### **Holmes County**

- 96<sup>th</sup> Highest State System, SR 241 between Millersburg Corporation Line and CR 616
- 52<sup>nd</sup> Highest Local System, School Street between S Railroad Street and Bucy Drive
- 80<sup>th</sup> Highest Local System, TR 454 between TR 452 and SR 39

### **Muskingum County**

No road segments in the top 100 local or top 100 state lists

### **Tuscarawas County**

- 96<sup>th</sup> Highest Local System, Pleasant Valley Drive between Reeds Run Road NE and 0.5 miles south of Reeds Run Road NE

## **3.9.4 Geometrics**

Geometrics data represents the grade, and/or curve of a road where crashes occur. Crashes related to road geometrics are summarized in Figure 3-33 and Table 3-13. Note that police reports for 166 crashes provided no geometrics data. Appendix L shows maps by county of accidents involving curved roads designated by fatal and non-fatal accidents.

Figure 3-33: Frequency of Crashes by Road Contour

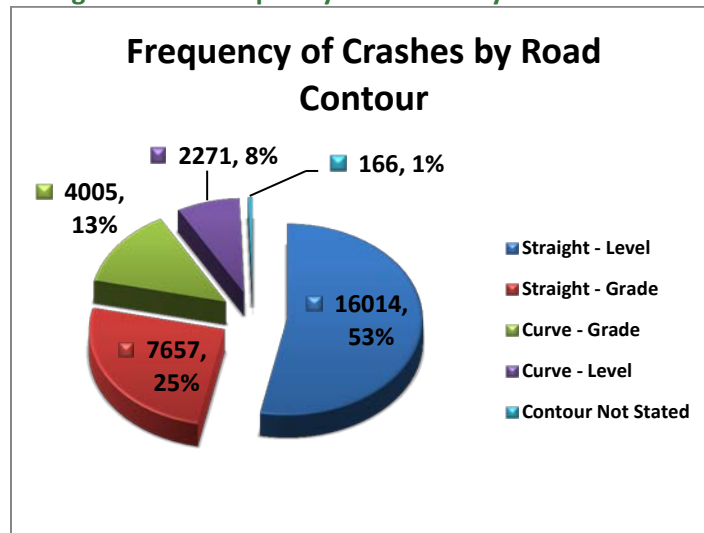
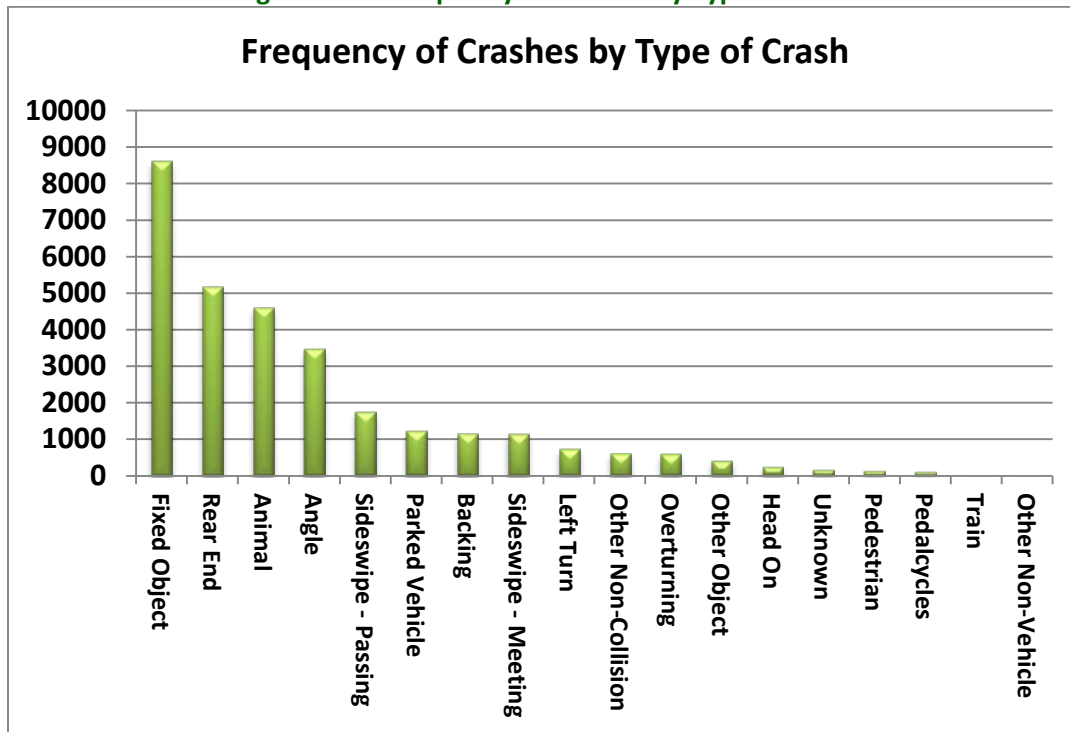


Table 3-13: Crash Geometrics

	Contour Not Stated		Curve - Grade		Curve - Level		Straight - Grade		Straight - Level		Total	
	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
Carroll	11	0.78%	338	23.89%	139	9.82%	408	28.83%	519	36.68%	1415	100.00%
Columbiana	100	1.62%	784	12.67%	418	6.76%	2069	33.44%	2817	45.52%	6188	100.00%
Coshocton	10	0.80%	145	11.60%	137	10.96%	145	11.60%	813	65.04%	1250	100.00%
Guernsey	17	0.48%	549	15.39%	260	7.29%	976	27.36%	1765	49.48%	3567	100.00%
Harrison	0	0.00%	290	29.50%	113	11.50%	293	29.81%	287	29.20%	983	100.00%
Holmes	1	0.04%	379	16.73%	188	8.30%	767	33.85%	931	41.09%	2266	100.00%
Muskingum	14	0.19%	689	9.31%	484	6.54%	1739	23.51%	4472	60.45%	7398	100.00%
Tuscarawas	13	0.18%	831	11.79%	532	7.55%	1260	17.88%	4410	62.59%	7046	100.00%
<b>Total</b>	<b>166</b>	<b>0.55%</b>	<b>4005</b>	<b>13.30%</b>	<b>2271</b>	<b>7.54%</b>	<b>7657</b>	<b>25.43%</b>	<b>16014</b>	<b>53.18%</b>	<b>30113</b>	<b>100.00%</b>

Source:ODOT 2011 to 2013

Figure 3-34: frequency of Crashes by Type of Crash



Source: ODOT 2011 to 2013

### 3.9.5 Fixed Object Crashes

As shown in Figure 3-34 and Table 3-11, the most common type of accident within the OMEGA RTPO planning area is fixed object crashes. As indicated in Table 3-11, 28.59% of crashes were fixed object crashes. The percentage of fixed object crashes in Muskingum and Tuscarawas Counties is lower than the average, while the percentage of fixed object crashes in Carroll, Columbiana, Coshocton, Guernsey, Harrison and Holmes counties are higher than the average.

### 3.9.6 Animal Crashes

As indicated by Table 3-11 there were 4,626 crashes with animals, representing 15.36% of all crashes. As indicated by Table 3-14, 91% of those crashes were crashes with deer; 3.05% were crashes with farm animals, while 5.17% were crashes with other animals.

Table 3-14: Animal Crashes

	Carroll	Columbiana	Coshocton	Guernsey	Harrison	Holmes	Muskingum	Tuscarawas	Total
Deer Hit	117	800	183	676	113	217	858	1282	4246
Farm Animal Hit	4	22	6	19	13	40	14	23	141
Other Animal	9	48	25	24	7	36	47	43	239
<b>Total</b>	<b>130</b>	<b>870</b>	<b>241</b>	<b>719</b>	<b>133</b>	<b>293</b>	<b>919</b>	<b>1348</b>	<b>4626</b>

Source: ODOT 2011 to 2013

### 3.9.7 Heat Map Showing All Crashes

Appendix J1 contains a county by county heat map of all crashes. Appendix J2 contains a county by county heat map of rural accidents. The difference between these two maps is that the complete heat maps contains all crashes, the rural heat map only includes accidents that occur outside of cities or villages. This allows the heat map scale to cover a smaller range by excluding large population areas so you can see the areas of the rural areas with larger number of accidents much easier. Areas of red indicate a higher occurrence of crashes, while green indicates fewer crashes.

Using these heat maps, OMEGA has identified the following areas of concern.

#### Carroll County

- In Carrollton, 41 crashes happened within two blocks of the intersection of Lisbon Street and Main Street, with 13 crashes occurring within the intersection itself.
- In Minerva there are 39 crashes along State Route 183, a section of road 1.25 miles long. Five of the crashes were at the intersection at Grant Boulevard.
- In Brown Township at the intersection of State Route 43 and State Route 183, 26 crashes within a block of the intersection including 9 crashes in the intersection have occurred.

#### Columbiana County

- In Saint Clair Township along one mile of State Route 170 between Dresden Avenue and Saint Clair Avenue, approximately 150 crashes with 33 in the intersection at Dresden Avenue and 19 in the intersection with Saint Clair Avenue have occurred.
- In Hanover Township, 29 crashes occurred within one half mile of the intersection of State Route 9 and State Route 172.
- In Salem Township, 55 crashes occurred along State Route 45 between St Jacob Logtown Road and State Route 558.

#### Coshocton County

- In Coshocton, 80 accidents along 2<sup>nd</sup> Street between Chestnut Street and Vine Street, a section of road only half a mile long, have occurred.
- In Lafayette Township, 10 accidents occurred at the intersection of State Route 93 and US 36.
- In Bethlehem Township, 18 crashes occurred within one mile of the intersection of US 36 and State Route 60.

#### Guernsey County

- Near Exit 178 on I-70 at State Route 209, approximately 85 crashes have occurred with 33 being at the interstate.
- In Oxford Township, 34 crashes occurred along Interstate 70 between Batesville Road and Pisgah Road.
- In Valley Township, 83 crashes occurred along State Route 313 within the township boundaries

#### Harrison County

- In Cadiz, 30 crashes near a 500 foot section of Main Street between Warren Street and Market Street have occurred.



- In Monroe Township, 26 crashes occurred along Cadiz- Dennison Road between the Tuscarawas County line and Plum Run Road.
- In Green Township, 9 crashes occurred along the half mile section of Cadiz-Steubenville Road between Hopedale and the Jefferson County Line

#### **Holmes County**

- Along a 1.5 mile curved section of State Route 83 in Mechanic Township, 24 crashes have occurred.
- Between Berlin and Walnut Creek, 100 crashes occurred along the 4 mile stretch of SR 39 between US 62 and SR 515
- In Berlin Township, 39 crashes occurred along a 700 foot section of US 62/SR 39 between the west end of Oak Street and the east end of Oak Street.

#### **Muskingum County**

- In Zanesville approximately 700 crashes occurred along Maple Avenue between Brandywine Avenue and SR 146.
- In Zanesville along SR 60 between Linden Avenue and Elm Street approximately 180 crashes occurred with 47 at Linden Avenue and 36 at Elm Street.
- In Wayne Township, 41 crashes occurred along SR 60 between Millers Lane and Cutler Lake Road.

#### **Tuscarawas County**

- In New Philadelphia, 141 crashes occurred within one quarter mile of the intersection of SR 39 and High Avenue with 45 crashes occurring in the intersection.
- Along a 3.5 mile section of US 250 between Dennison and the Harrison County Line, 64 crashes have occurred.
- In Goshen Township, 123 crashes have occurred between New Philadelphia and Roswell along SR 39.

### **3.9.8 High Risk Intersections**

ODOT District 11 has identified 11 intersections of concern in Carroll, Columbiana, Harrison, Holmes and Tuscarawas Counties. A summary of the accidents that have occurred within 500 feet of each of these intersections is provided in Table 3-15.

**Table 3-15: High Risk Intersections**

Location	County	Crashes	Fatalities	Issue	Comments	
SR 39 and SR 43	Carroll	19	0	Sight distance and poor turning radius	3 were Left Turns	11 were Rear Ends
SR 9 and SR 43	Carroll	39	0	Sight distance and poor turning radius	11 were Fixed Object	6 were Backing
SR 170 and TR 1026	Columbiana	3	0	Crash history	1 was Angle	1 was Fixed Object
SR 517 and SR 558	Columbiana	3	0	Sight distance and profile grades	1 was Animal	1 was Other Object
SR 39 and CR 77	Holmes	9	0	Crash history, sight distance and turn lanes	7 were Rear Ends	2 were Angle
US 62 and CR 207	Holmes	5	0	Crash history and sight distance	4 were Angle	1 was Backing
SR 515 and CR 168	Holmes	6	0	Sight distance	4 were Angle	1 was Side Sweep-Meeting
US 250 and SR 646	Harrison	4	1	Turning movements from US 250 to SR 646	2 were Fixed Objects	2 were Angle
US 250 and SR 151	Harrison	8	1	Crash history and need for turn lanes	3 were Fixed Objects	2 were Animal
SR 39 and CR 89	Tuscarawas	5	0	Crash history and increased truck traffic	3 were Animals	2 were Rear Ends
SR 39 and TR 314	Tuscarawas	7	0	Crash history and increased truck traffic	4 were Animals	2 were Rear Ends

Source: ODOT 2011 to 2013

### 3.9.9 US Route 30 Crash Rate Analyses

US 30 Ohio's Energy Corridor is a statewide highway corridor and critical to economic development of the region. Given the importance of this corridor, OMEGA reviewed the crash data for the period between 2011 and 2013 to assess the need for safety improvements along US 30 between the Stark County border and SR 11. A crash rate study was performed along the corridor to determine the rate of crashes.

Crash rate was calculated using the procedures in ODOT's Safety Project Scoring Tool FY2014 Spreadsheet. The crash rate is calculated by using the following formula and inserting 3 for the number of years:

$$(\text{Number of Crashes} \times 1,000,000) / ((\text{years} \times 365) \times \text{Length} \times \text{ADT})$$

Crash rates along the US 30 are provided in Table 3-16 along with the corresponding core for this element under ODOT's Safety Program. As shown in Table 3-16 and Figure 3-35, four segments along US 30 have crash rates high enough to receive the maximum of 10 points for this criteria and one segment would receive 8 points. These segments are:

- Section begin 17.70: Middle Fork Little Beaver Creek to Market Street in Lisbon (10 points)
- Section begin 18.32: Market Street to Lincoln Way in Lisbon (10 points)
- Section begin 24.71: State Route 45 to East Liverpool Rd in Madison Township (10 points)
- Section begin 24.76: East Liverpool Rd to State Route 11 in Madison Township (10 points)
- Section begin 8.87: 1<sup>st</sup> to the Hanoverton Corporation Boundary in Hanoverton

**Table 3-16: US 30 Crash Rates**

Section Begin	Length	AADT	Crashes	Crash Rate	Score
0.00	2.98	7594	32	1.29	1
2.98	4.35	3519	45	2.68	4
7.33	1.54	3718	18	2.87	4
8.87	0.53	2629	7	4.59	8
9.40	6.94	2744	55	2.64	4
16.34	1.36	6211	31	3.35	5
17.70	0.62	6630	25	5.55	10
18.32	0.54	8778	36	6.94	10
18.86	1.49	5412	18	2.04	3
20.35	3.53	3915	41	2.71	4
23.88	0.83	3915	9	2.53	4
24.71	0.05	4119	2	8.87	10
24.76	0.33	1079	10	25.65	10

Source: ODOT 2011 to 2013



Figure 3-35: US 30 Crash Rates

