

## OVERALL CRASH STATISTICS

Between 2007 and 2011 there were a total of 190,302 crashes reported within MORPC's Transportation Planning Area. Close to 500,000 people were involved in these crashes, of which 507 were fatally injured and 4,701 suffered incapacitating injuries.

While these figures are alarming, there are some encouraging trends. For instance, total crashes declined by 12% from 41,009 in 2007 to 36,091 in 2011. With the exception of 2010, fewer crashes were reported each year than in the previous year, and although fatalities increased in 2011, the overall number of serious injury crashes is down significantly since 2007. This is good news for central Ohio since serious injury crashes are a better indication of the crash severity trend than fatalities, which vary somewhat randomly from year to year. It should also be noted that the observed crash reduction comes at a time when the central Ohio population is increasing.

Table 1. Crash Trends by Year, 2007 to 2011

YEAR	CRASH STATISTICS				OCCUPANT STATISTICS					SAFETY METRICS		
	Fatal Crashes	Injury Crashes	Property Damage Crashes	Total Crashes	Fatalities	Serious Injuries	Minor Injuries	No Injuries	Total People Involved	Injury Rate	MORPC Severity Index	Fatalities and Serious Injuries per 100,000 population
2007	89	10,473	30,447	41,009	95	954	14,421	88,831	104,301	25.8%	1.53	752
2008	105	9,796	28,717	38,618	119	968	13,265	82,666	97,018	25.6%	1.54	774
2009	93	9,217	27,229	36,539	98	908	12,437	80,303	93,746	25.5%	1.53	713
2010	88	9,965	27,992	38,045	92	988	13,456	82,525	97,061	26.4%	1.55	756
2011	97	9,074	26,920	36,091	103	883	12,237	78,520	91,743	25.4%	1.53	688
5-Year Total	472	48,525	141,305	190,302	507	4,701	65,816	412,845	483,869	25.7%	1.54	3,682
Annual Average	94	9,705	28,261	38,060	101	940	13,163	82,569	96,774	25.7%	1.54	736
Percent Change (2007 to 2011)	9.0%	-13.4%	-11.6%	-12.0%	8.4%	-7.4%	-15.1%	-11.6%	-12.0%	-1.3%	-0.1%	-8.6%

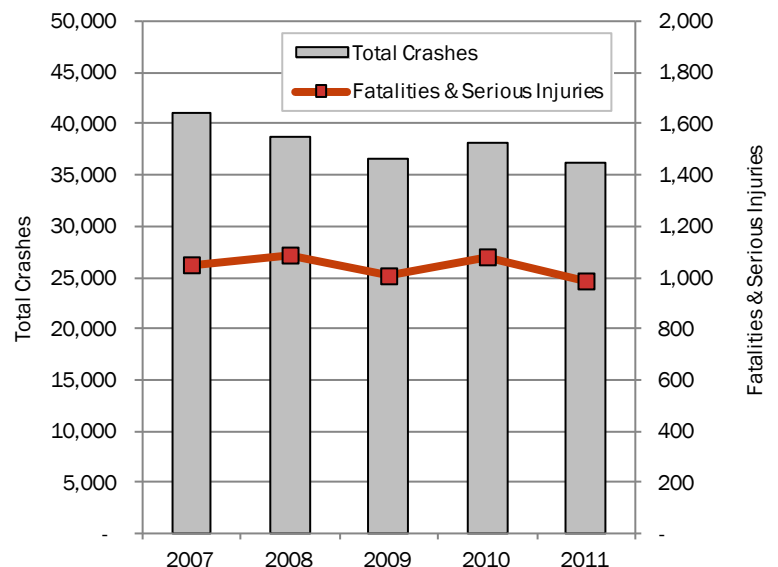
### Notes

- Shaded yellow cells indicate the year with the highest value for each respective column.
- The Severity Index is calculated by the following formula:  $[(12 \times \#FatalCrashes) + (3 \times \#InjuryCrashes) + \#NoInjuryCrashes] / \#TotalCrashes$ .

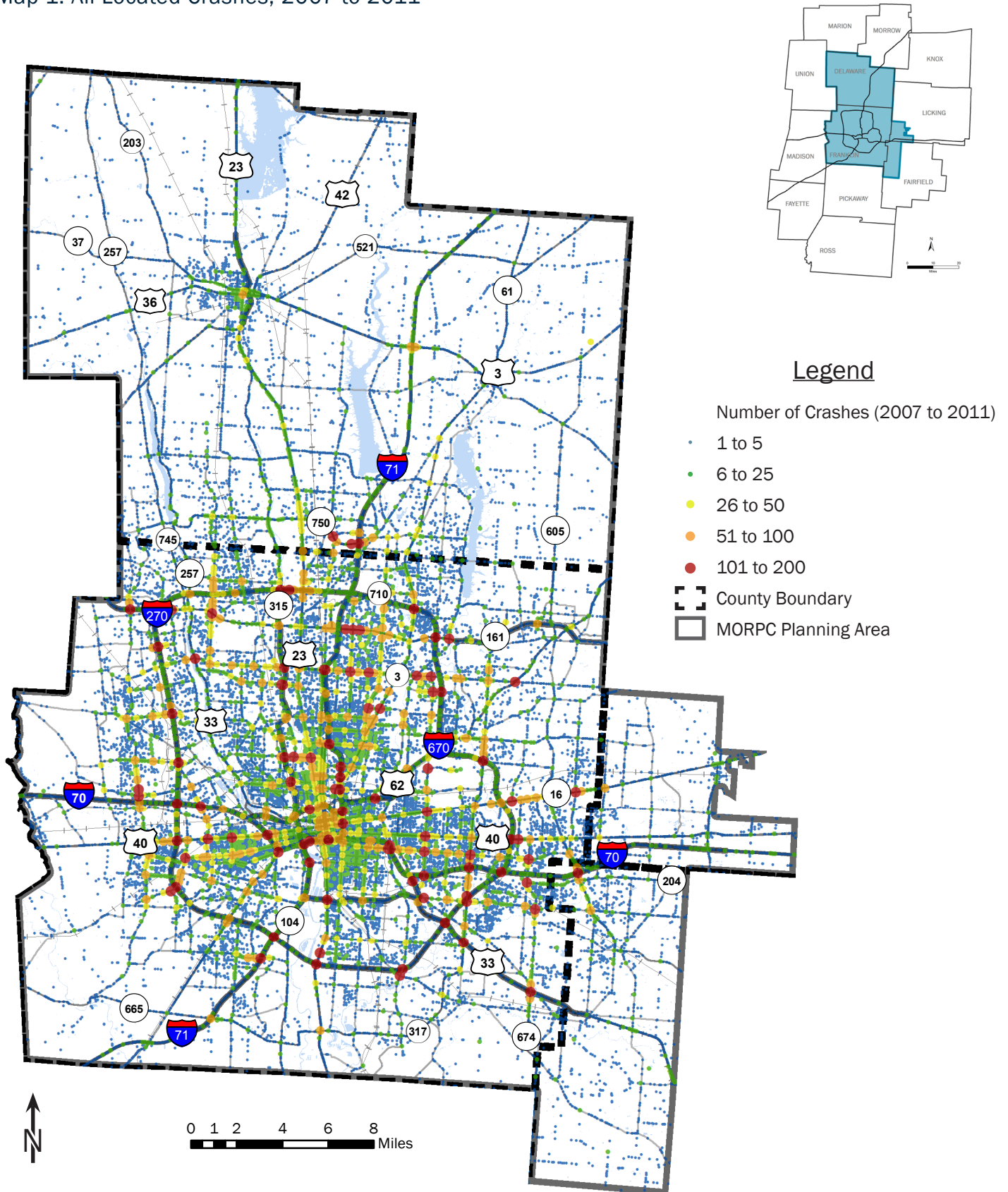
### Key Facts

- The total number of crashes reported in central Ohio was 12% lower in 2011 compared to 2007.
- Around 265 people are involved in a car crash every day.
- On average, a fatal crash occurs approximately every 4 days.
- The likelihood of a central Ohioan being killed in a car crash in any given year is around one in 14,000, while one out of every 1,500 residents is likely to be seriously injured.
- Approximately one out of four crashes results in an injury; however, most injuries are minor.

Figure 1. Overall Crash Statistics, 2007 to 2011



Map 1. All Located Crashes, 2007 to 2011



The information shown on this map is compiled from various sources available to us which we believe to be reliable.  
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Source: ODPS/ODOT/MORPC

## CRASH TYPES

While every crash is unique in some respect, they can be categorized according to the circumstances of the crash. Categorizing crashes in this way is an important step, as each crash type indicates a particular problem that may be addressed through a targeted engineering, enforcement, or behavioral countermeasure.

### Key Facts

- From 2007 to 2011, there were over 60,000 rear-end crashes in central Ohio, making them the most common of all crash types. Fortunately, only 1% of rear-end crashes resulted in a fatality or serious injury.
- Although there were only half as many angle crashes as rear-end crashes, there were nearly twice as many fatal angle crashes and more serious injury crashes as well.
- Fixed-object crashes are the third most frequent crash type, but account for the largest share of fatal and serious injury crashes (25%).
- Close to 20% of pedestrian crashes and 10% of bicycle crashes result in a fatality or serious injury compared to just 2% for all crashes.

Figure 2. Select Crash Type Trends, 2007 to 2011

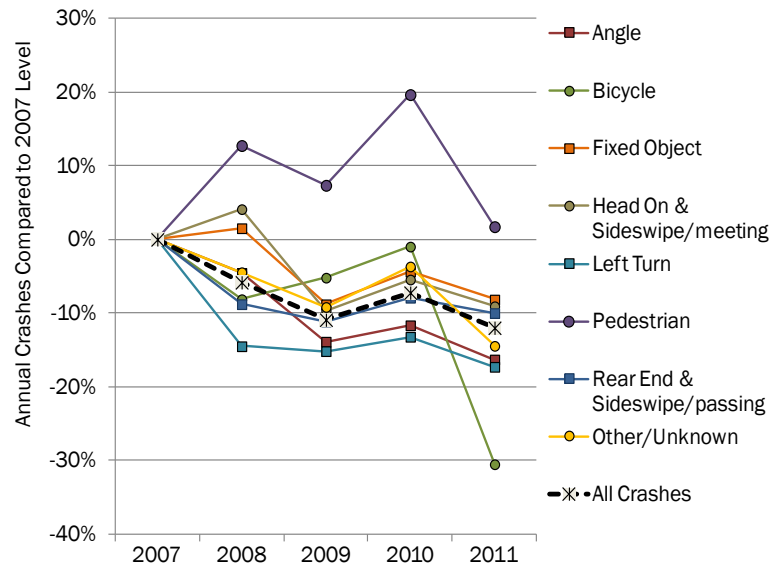


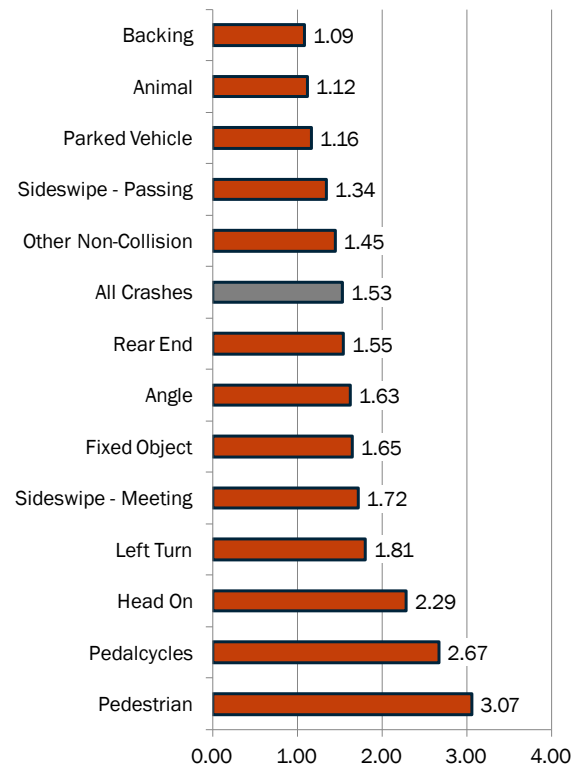
Table 2. Crash Type by Frequency and Severity, 2007 to 2011

CRASH TYPE	TOTAL CRASHES	CRASH SEVERITY				FSI RATE
		Fatal	Serious Injury	Minor Injury	No Injury	
Angle	30,582	49	656	8,635	21,242	2.3%
Animal	5,314	2	25	290	4,997	0.5%
Backing	6,215	2	9	245	5,959	0.2%
Bicycle	1,402	9	124	997	272	9.5%
Fixed Object	23,706	147	935	5,961	16,663	4.6%
Head On	1,240	25	108	554	553	10.7%
Left Turn	9,918	28	319	3,540	6,031	3.5%
Other Non-Collision	2,495	5	69	460	1,961	3.0%
Other Non-Vehicle	1	-	-	-	1	0.0%
Other Object	1,114	2	11	107	994	1.2%
Overturning	936	11	99	506	320	11.8%
Parked Vehicle	17,170	12	110	1,234	15,814	0.7%
Pedestrian	2,507	98	362	1,688	359	18.3%
Rear End	60,713	25	578	15,844	44,266	1.0%
Sideswipe - Meeting	3,785	37	160	993	2,595	5.2%
Sideswipe - Passing	22,810	18	247	3,546	18,999	1.2%
Train	16	-	-	7	9	0.0%
Unknown	378	2	19	87	270	5.6%

#### Notes

- Shaded yellow cells indicate the crash type with the highest value for each respective column.
- FSI Rate refers to the percentage of crashes resulting in a fatality or serious injury.

Figure 3. Severity Index for Select Crash Types

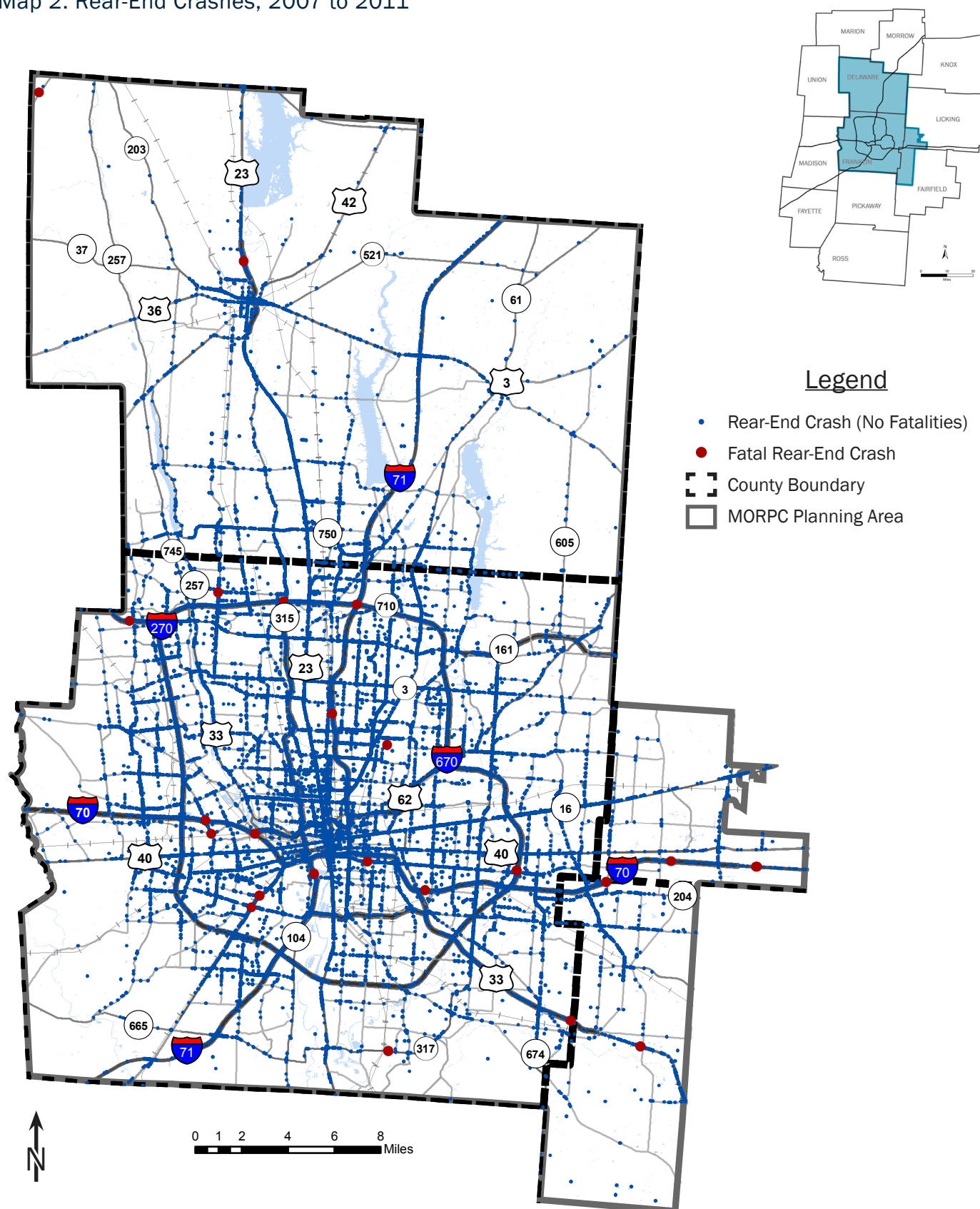


#### Notes

- The Severity Index is calculated by the following formula:  

$$\left[ \frac{(12 \times \#FatalCrashes) + (3 \times \#InjuryCrashes) + \#NoInjuryCrashes}{\#TotalCrashes} \right]$$

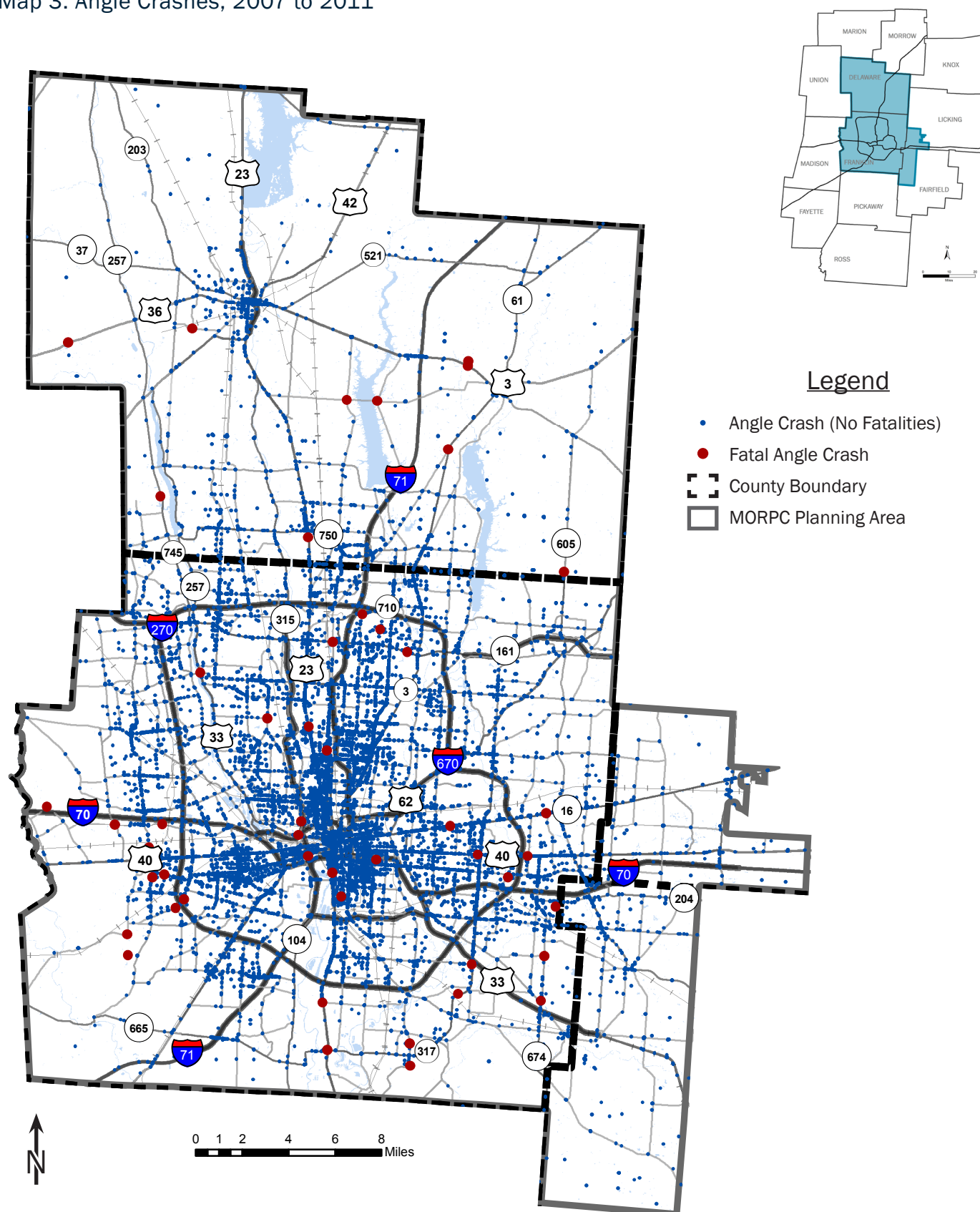
Map 2. Rear-End Crashes, 2007 to 2011



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Source: ODPS/ODOT/MORPC

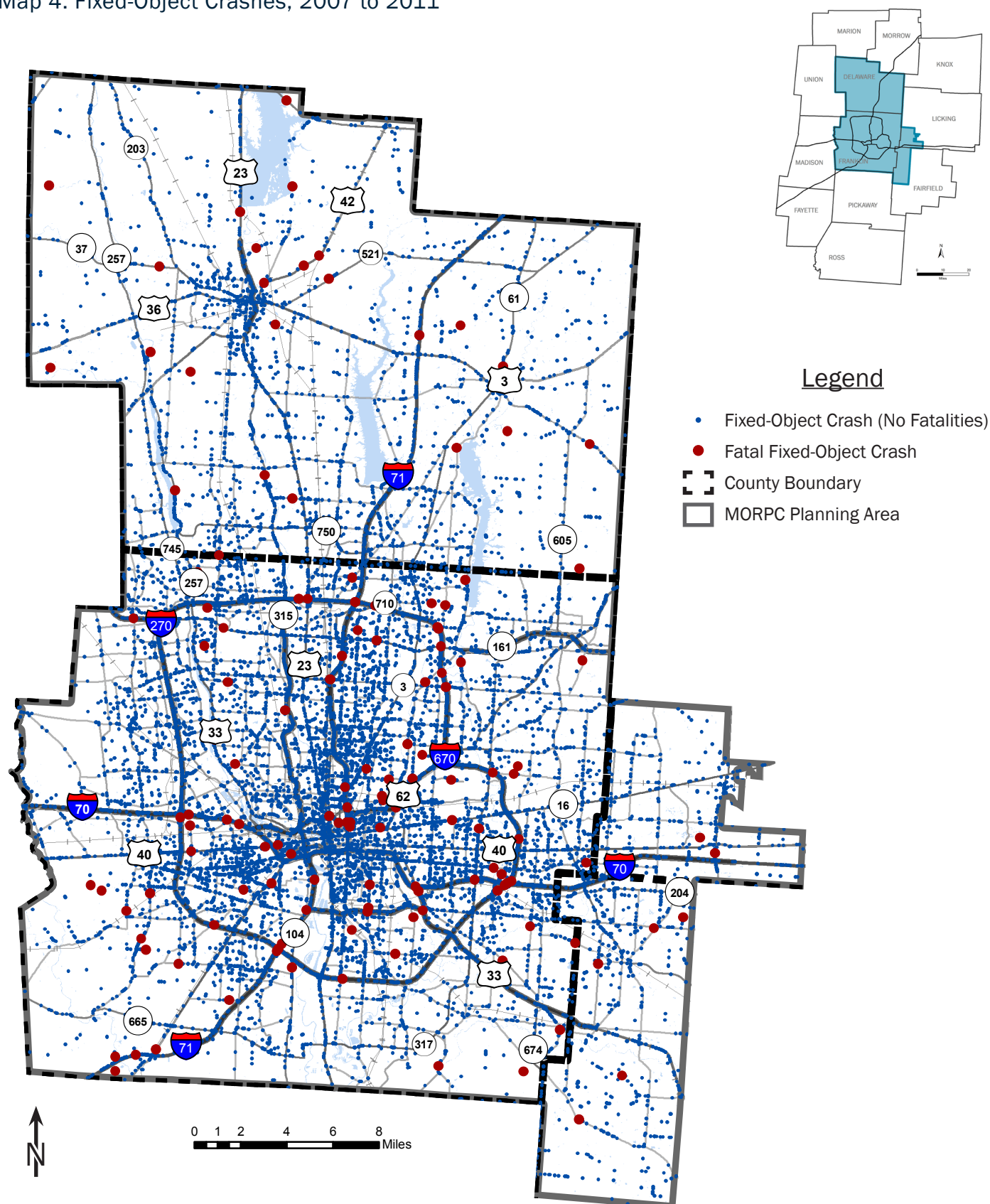
### Map 3. Angle Crashes, 2007 to 2011



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*Source: ODPS/ODOT/MORPC*

Map 4. Fixed-Object Crashes, 2007 to 2011



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Source: ODPS/ODOT/MORPC

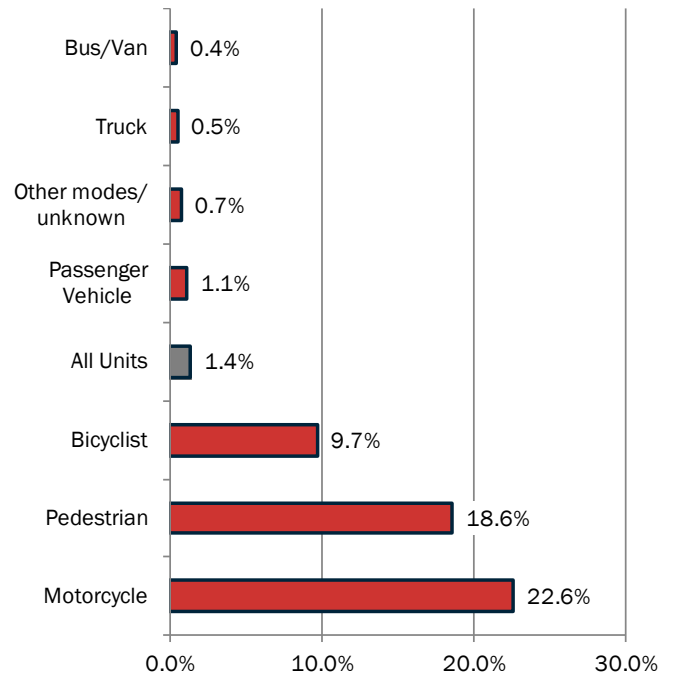
## UNIT STATISTICS

The majority of crashes in central Ohio occur among one or more passenger vehicles. However, it is also important to understand the frequency and severity of the other types of 'units' involved. In this context, the term 'unit' refers to the vehicle involved in the crash. For bicycle and pedestrian crashes, the 'unit' refers to the person involved.

Table 3. Unit Statistics, 2007 to 2011

UNIT TYPE	MOST SEVERE INJURY				TOTAL UNITS	UNITS IN ERROR
	Fatal Injury	Serious Injury	Minor Injury	No Injury		
Bicyclist	12	123	1,002	202	1,339	49%
Bus/Van	0	12	280	2,494	2,786	38%
Motorcycle	63	443	1,231	420	2,157	49%
Other modes	2	22	274	1,181	1,479	37%
Passenger Vehicle	307	3,176	49,222	242,426	295,131	49%
Pedestrian	89	339	1,567	162	2,157	39%
Truck	7	53	594	11,141	11,795	55%
Unknown	0	44	302	1,821	2,167	89%

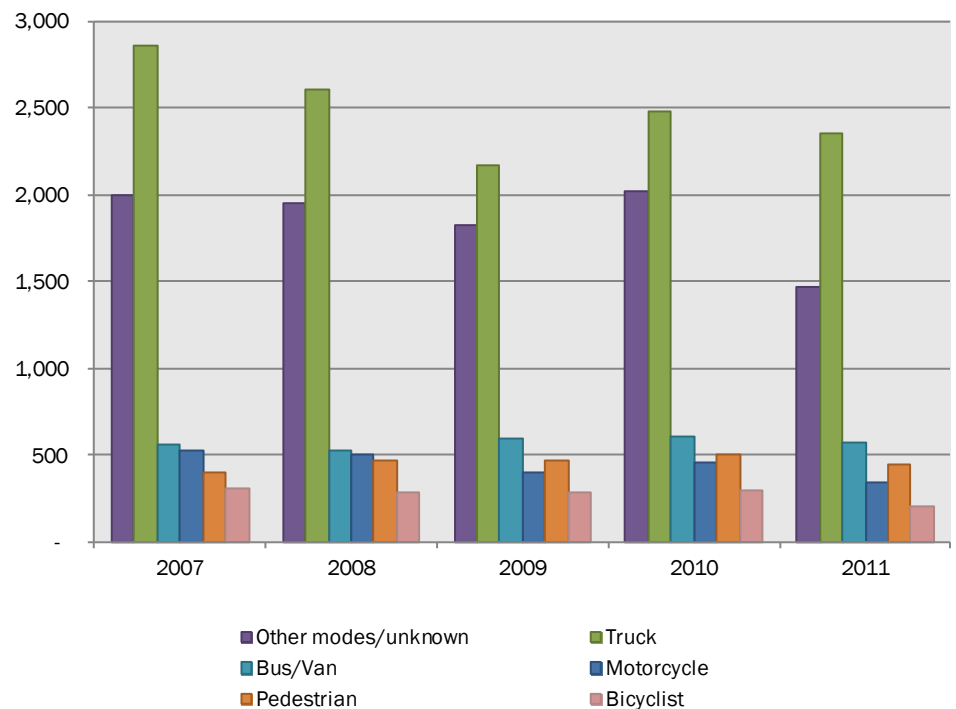
Figure 4. Fatal & Serious Injury Rate by Unit Type



### Key Facts

- From 2007 through 2011, there were 343,615 units involved in reported crashes. Of these, over 295,000 (86%) were passenger vehicles. Trucks were the next most common type, accounting for nearly 12,000 units (3.4%).
- Occupants of buses and vans are the least likely to suffer a fatal or serious injury during a crash, while motorcyclists, pedestrians, and bicyclists are the most vulnerable.
- Motorcyclists and their passengers are 20 times more likely to be killed or seriously injured in a crash during a collision than the occupants of a passenger vehicle. The comparable figures for pedestrians and bicyclists are 17 and 9, respectively.
- The number of units reported has declined since 2007 for each mode, except for pedestrians and buses/vans.

Figure 5. Number of Units Reported by Year (excluding passenger vehicles)



## CONTRIBUTING FACTORS & ROADWAY CONDITIONS

The factors leading up to a crash provide engineers and law enforcement officials with valuable information needed to reduce the severity and frequency of future crashes. In this regard, there are behavioral aspects, along with infrastructure and environmental conditions, that must be considered. The statistics shown here refer to the contributing factor for the at-fault vehicle (the 'Unit in Error' as noted on the crash report).

### Key Facts

- Following too closely is the most common contributing factor, accounting for around 30% of all crashes.
- Failure to control accounts for only 15% of all crashes, but 26% of fatal & serious injury crashes.
- Around 3.4% of crashes occurring under dark, unlit conditions result in a fatality or serious injury, compared to 1.7% during daylight conditions.
- Surprisingly, crashes that occur during wet conditions (rain, snow, or ice) are less severe compared to those during normal, dry conditions.
- Speed-related crashes are more than twice as likely to result in a fatal or serious injury than other crashes.
- Almost 4% of single-car crashes result in a fatality or serious injury compared to 1.8% of crashes involving two vehicles.

Figure 6. Primary Contributing Factors (excluding pedestrian and bike crashes)

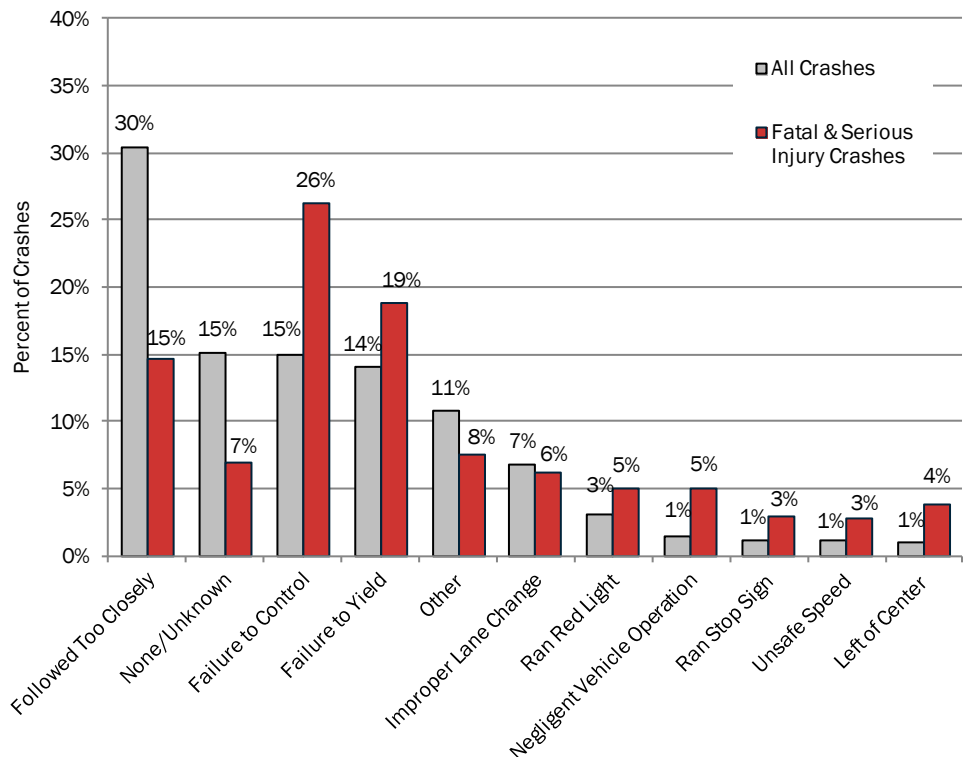


Figure 7. Risk Factors for Fatal and Serious Injuries

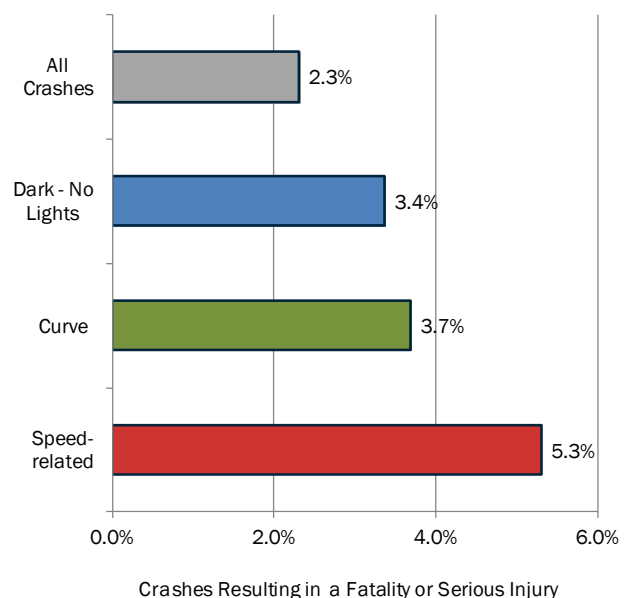


Table 4. Effect of Speeding and Number of Units on Severity

Number of Units Involved in Crash		1	2	3 or more	Total
Not Speed-Related	Total Crashes	25,911	134,696	15,070	175,677
	FSI Crashes	882	2,211	504	3,597
	FSI Rate	3.4%	1.6%	3.3%	2.0%
Speed-Related	Total Crashes	5,038	7,069	1,180	13,287
	FSI Crashes	337	284	83	704
	FSI Rate	6.7%	4.0%	7.0%	5.3%
All Crashes	Total Crashes	30,949	141,765	16,250	188,964
	FSI Crashes	1,219	2,495	587	4,301
	FSI Rate	3.9%	1.8%	3.6%	2.3%

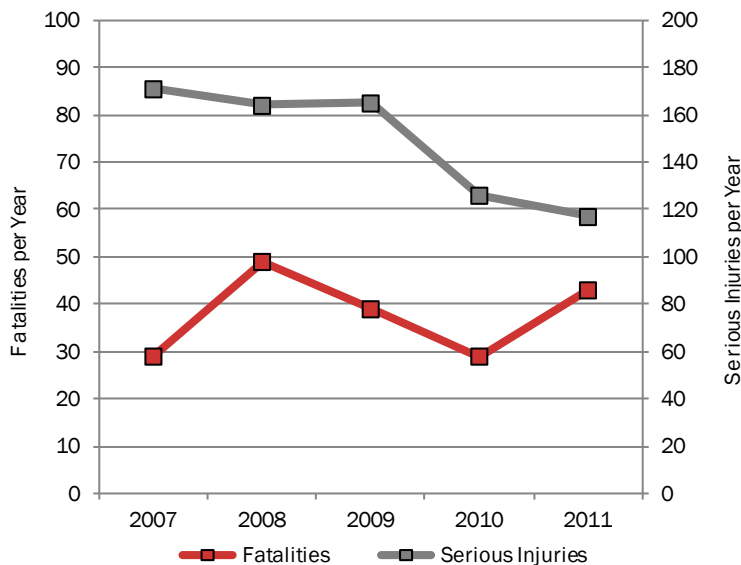
#### Notes

- These data include only those crashes where a determination was made as to whether the crash was speed-related.
- The shaded yellow cells indicate the highest value for each row.
- FSI Crashes = the number of fatal and serious injury crashes.
- FSI Rate = the percent of crashes that resulted in a fatal or serious injury.

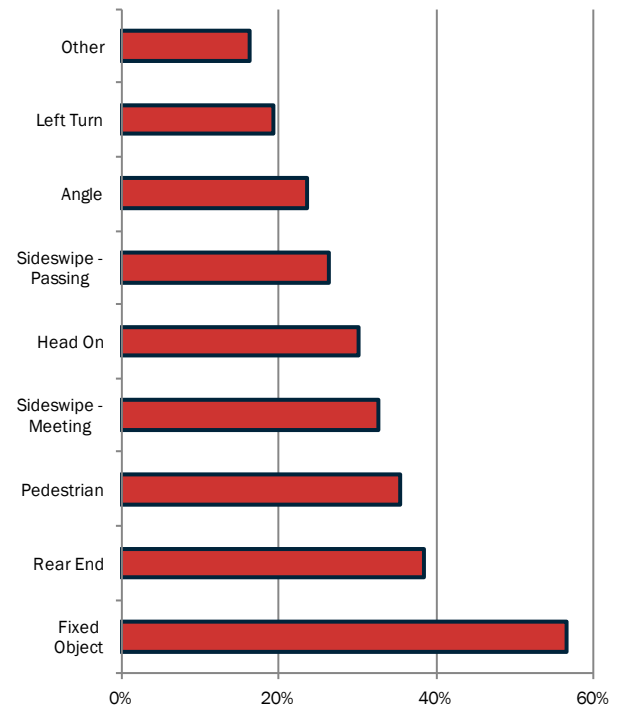
## ALCOHOL-RELATED FATALITIES & SERIOUS INJURIES

Alcohol is a suspected factor in many of the fatal and serious injury crashes in central Ohio. Between 2007 and 2011, an average of 38 people died in alcohol-related crashes each year and close to 150 more sustained serious injuries. For the purposes here, a fatality or serious injury is classified as 'alcohol-related' if the driver, pedestrian, or bicyclist of the at-fault vehicle was suspected of being under the influence of alcohol by the reporting officer.

**Figure 8. Alcohol-Related Fatalities & Serious Injuries by Year**



**Figure 9. Percent of Fatalities Resulting from Alcohol-Related Crashes, by Crash Type**



### Key Facts

- From 2007 to 2011, alcohol was a suspected factor in 37% of all fatalities and 16% of serious injuries.
- Alcohol is suspected in over half of all fatalities resulting from fixed-object crashes.
- Alcohol-related serious injuries declined by 30% between 2007 and 2011.
- Although alcohol-related fatalities increased from 2007 to 2011, there is not a clear trend evident in the data.

**Table 5. Alcohol-Related Fatalities & Serious Injuries by Crash Type**

CRASH TYPE	FATALITIES				SERIOUS INJURIES			
	Total Fatalities	Alcohol-Related Fatalities	% Alcohol-Related	% All Fatalities (Alcohol-Related)	Total Serious Injuries	Alcohol-Related Serious Injuries	% Alcohol-Related	% All Serious Injuries (Alcohol-Related)
Angle	51	12	24%	2%	853	64	8%	1%
Fixed Object	159	90	57%	18%	1,071	325	30%	7%
Head On	30	9	30%	2%	200	48	24%	1%
Left Turn	31	6	19%	1%	417	30	7%	1%
Pedestrian	99	35	35%	7%	394	57	14%	1%
Rear End	26	10	38%	2%	696	69	10%	1%
Sideswipe - Meeting	43	14	33%	3%	241	55	23%	1%
Sideswipe - Passing	19	5	26%	1%	306	18	6%	0%
Other	49	8	16%	2%	523	77	15%	2%
<b>Total</b>	<b>507</b>	<b>189</b>	<b>37%</b>	<b>37%</b>	<b>4,701</b>	<b>743</b>	<b>16%</b>	<b>16%</b>

#### Notes

- The column titled '%All Fatalities/Serious Injuries (Alcohol-Related)' refers to the percent of all fatalities or serious injuries that are attributable to alcohol-related crashes of the particular crash type. For example, alcohol-related fixed-object crashes account for 18% of all fatal crashes and 7% of all serious injury crashes.
- Shaded yellow cells indicate the crash type with the highest value for each respective column. In this case, fixed-object crashes are the most problematic for alcohol-related crashes in all categories.

## OCCUPANT AND VEHICLE CHARACTERISTICS

There are many factors that influence whether someone is involved in a crash and the severity of resulting injuries. Driver experience and skill are important factors, along with the safety features of the vehicles involved. Additionally, a person's underlying health may affect the extent of their injuries.

### Key Facts

- Drivers and occupants over 30 years old are overrepresented in fatal and serious injuries compared to their involvement in all crashes, probably due to underlying health conditions.
- Although the population in central Ohio is aging, crashes attributable to senior drivers has declined since 2007.
- The number of crashes with a teenager listed as the at-fault driver was nearly 20% lower in 2011 compared to 2007.
- Drivers and occupants of vehicles built prior to 1985 are more than 6 times as likely to suffer a fatal or serious injury during a crash compared to vehicles built since 2010.

Figure 10. Percent of People Involved in Crashes by Age and Severity of Injuries

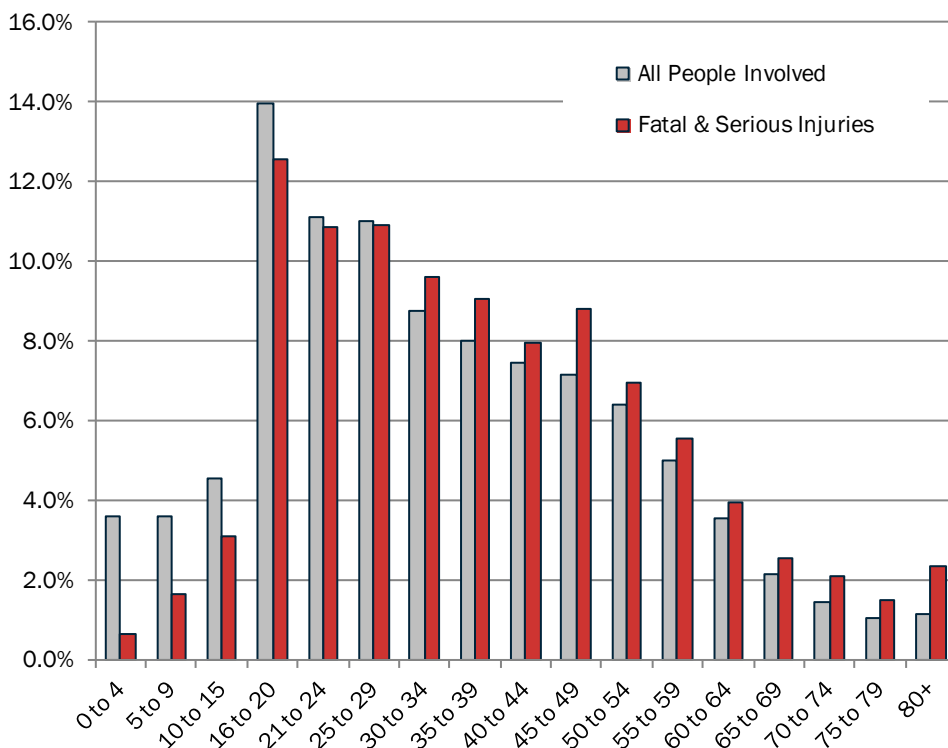


Figure 11. Fatal and Serious Injury Rate by Vehicle Year

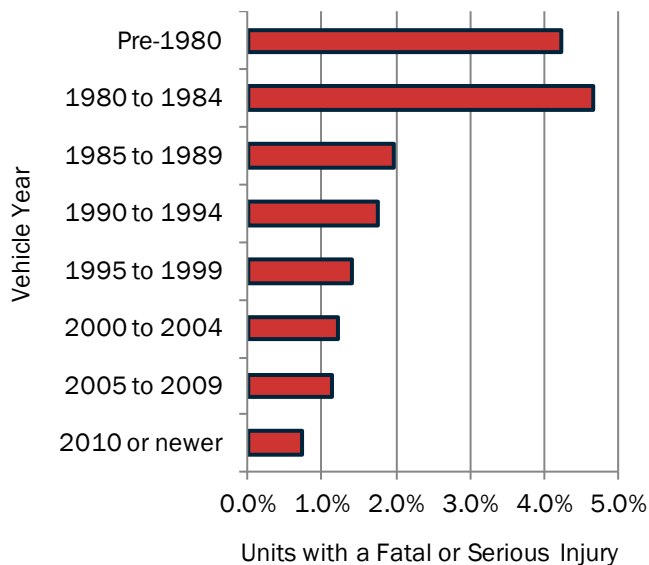
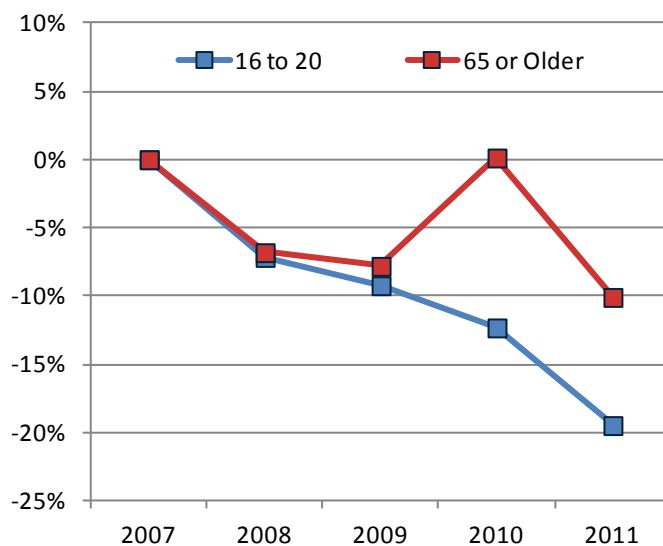


Figure 12. Crash Trend by Age of At-Fault Driver, Select Age Groups



## MOTORCYCLE CRASHES

Motorcycle crashes tend to be particularly severe due to the speed and vulnerability of the motorcyclist. Educational programs that seek to improve the motorcyclist's skill go a long way toward reducing the number and severity of crashes; however, behavioral issues like speeding also need to be addressed.

### Key Facts

- Motorcyclists have the highest rate of fatal and serious injuries reported among all types of roadway users - over 20% of motorcyclists suffered a serious injury or fatality when involved in a collision.
- The total number of motorcycle crashes declined by 34% from 2007 to 2011.
- The number of motorcycle crashes is highest throughout the warmer months of May thru September.
- Almost 25% of fatal motorcycle crashes are reported as being 'speed-related'.
- Motorcycle errors account for 55% of all motorcycle crashes, but 71% of fatal crashes.

Table 7. Motorcycle Crash Severity by Contributing Factor						
CONTRIBUTING FACTOR		CRASH SEVERITY				TOTAL CRASHES
		Fatal	Serious Injury	Minor Injury	No Injury	
MOTORCYCLIST ERROR	Failure To Control	21%	34%	29%	16%	27%
	Followed Too Closely/ACDA	9%	6%	8%	16%	9%
	Improper Lane Change/Passing/Offroad	2%	4%	3%	5%	3%
	Negligent vehicle operation	7%	4%	2%	2%	3%
	Unsafe Speed or Exceeded Speed Limit	14%	3%	2%	1%	2%
	Other Factors	18%	8%	11%	8%	10%
	Total (Motorcyclist Error)	71%	59%	55%	47%	55%
OTHER UNIT IN ERROR	Failure To Yield	14%	25%	23%	15%	21%
	Followed Too Closely/ACDA	2%	2%	7%	21%	9%
	Improper Lane Change/Passing/Offroad	2%	3%	3%	4%	3%
	Improper Turn	2%	3%	3%	3%	3%
	Ran Red Light	2%	1%	1%	0%	1%
	Other Factors	7%	7%	9%	10%	9%
	Total (Other Unit in Error)	29%	41%	45%	53%	45%
Total Crashes		3%	21%	56%	21%	100%

#### Notes

- Percentages shown are based only on crashes with an 'at-fault' vehicle reported.
- Percentages shown refer to the portion of total crashes attributable to the contributing factor, for each severity level. For instance, 'Failure to Control' accounts for 21% of all fatal motorcycle crashes.
- Shaded yellow cells indicate the contributing factor with the highest value for each respective column, excluding grouped categories ('Other Factors').

Table 6. Motorcycle Crashes by Severity, 2007-2011

YEAR	CRASH SEVERITY		TOTAL CRASHES	FSI RATE
	Fatal	Serious Injury		
2007	10	93	527	20%
2008	13	103	504	23%
2009	16	83	399	25%
2010	12	88	463	22%
2011	12	76	347	25%
Total	63	443	2,240	23%

#### Notes

- FSI Rate = the percent of crashes that resulted in a fatal or serious injury.

Figure 13. Average Motorcycle Crashes by Month

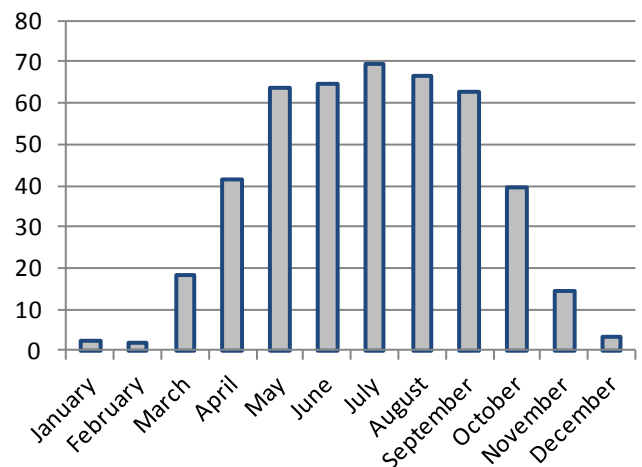
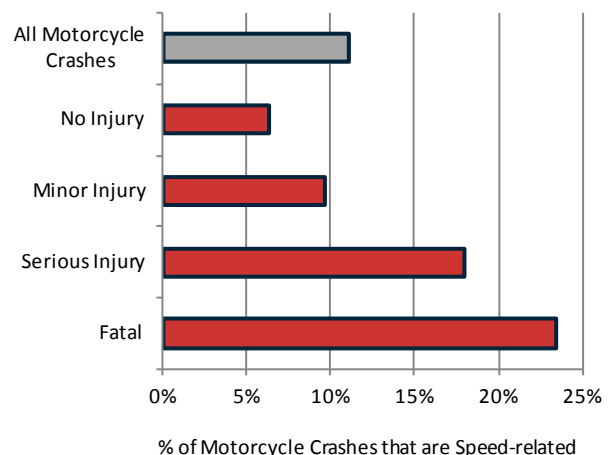
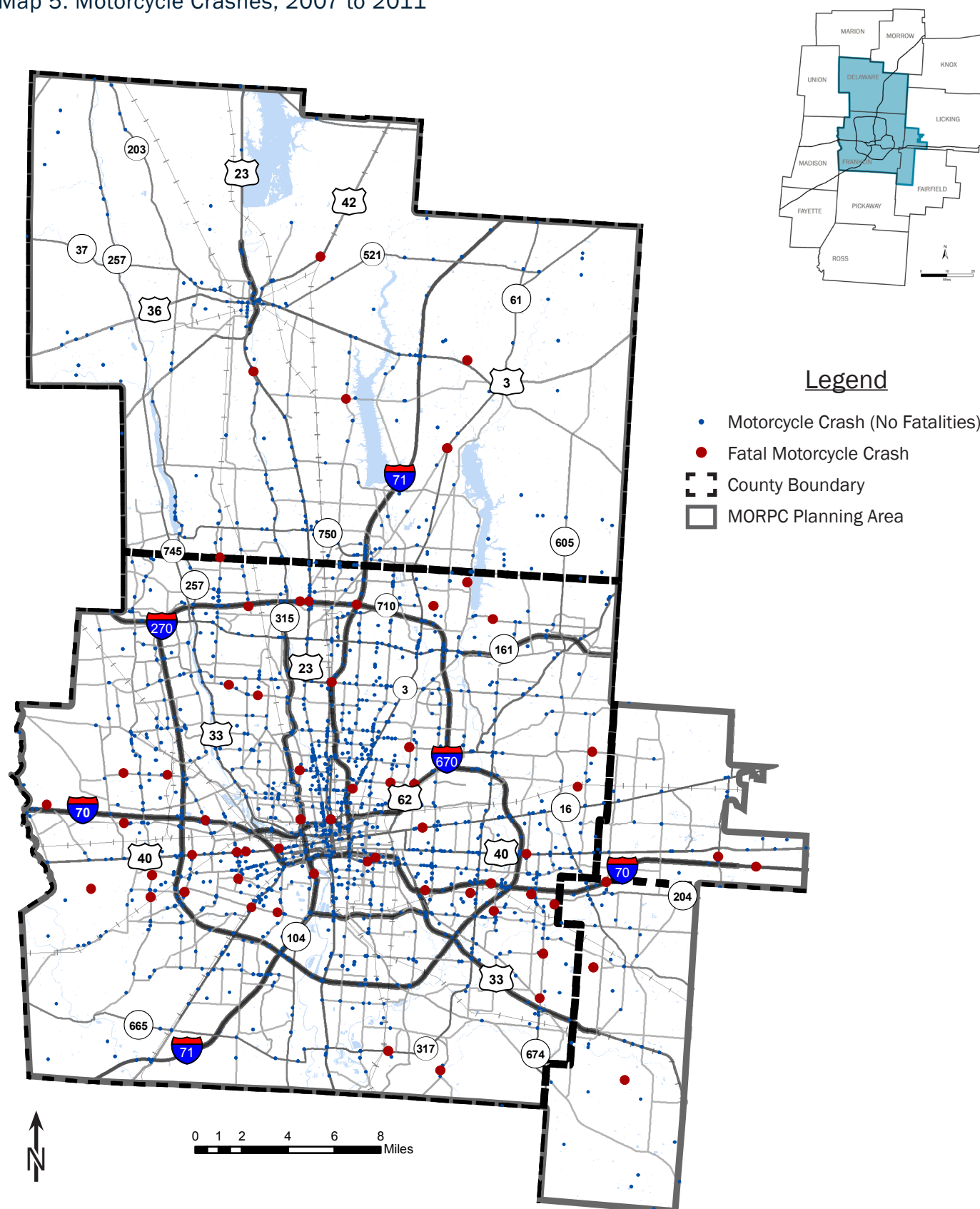


Figure 14. Motorcycle Crash Speed and Severity



Map 5. Motorcycle Crashes, 2007 to 2011



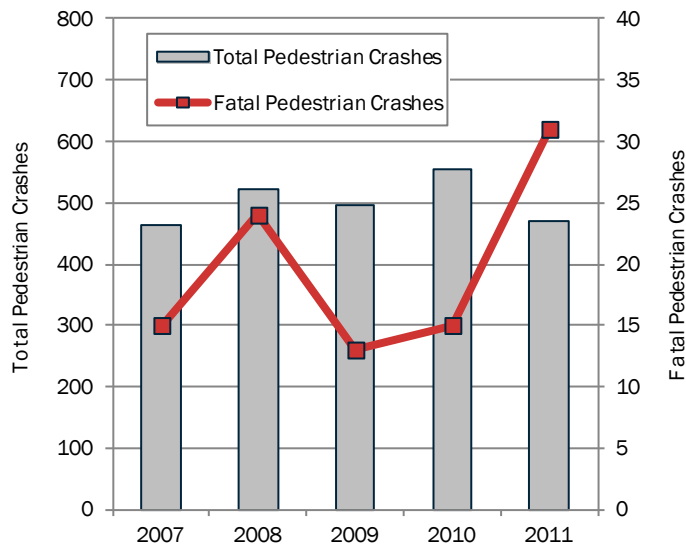
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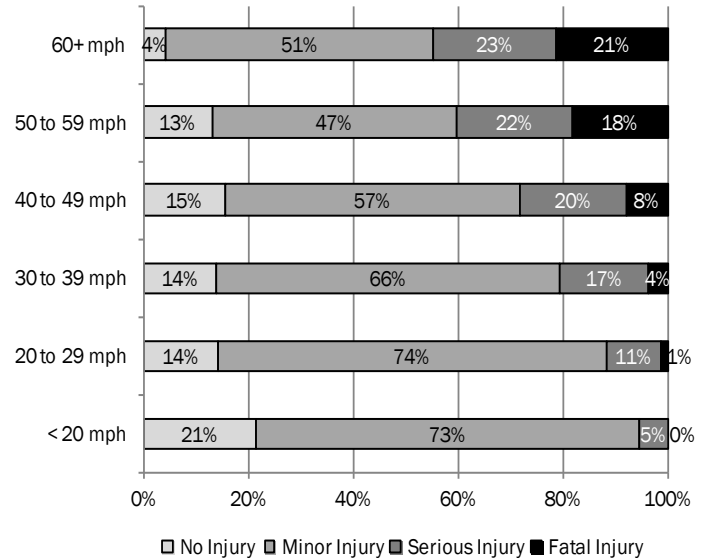
## PEDESTRIAN CRASHES

Although the number of pedestrian crashes in central Ohio is relatively low compared to other crash types, they tend to be much more severe, and therefore are an important area of concern. From 2007 to 2011, pedestrian crashes accounted for over 20% of all fatal crashes.

**Figure 15. Pedestrian Crash Trend, 2007 to 2011**



**Figure 16. Pedestrian Crash Severity by Speed Limit**



### Key Facts

- In contrast to other crash types, pedestrian crashes have remained roughly constant over the 5-year period.
- Pedestrian fatalities doubled in 2011 compared to 2010; however, this is likely due to random year-to-year variation rather than indicating a trend (preliminary 2012 pedestrian fatality totals are similar to 2010 figures).
- Speed is a key determinant of the injury level sustained in a pedestrian crash. Pedestrian crashes on roads with a posted speed limit less than 30mph rarely lead to a fatality. The fatality rate increases sharply beyond 30mph, rising to over 20% where the speed limit is 60mph or greater.
- Pedestrians were reported to be at fault in 42% of all pedestrian crashes, but 71% of fatal crashes.
- 'Improper crossing' and 'illegally in roadway' combine to account for over 50% of reported fatal crashes involving a pedestrian, while "failure to yield" on the part of the driver was the most common cause of crashes reported overall.

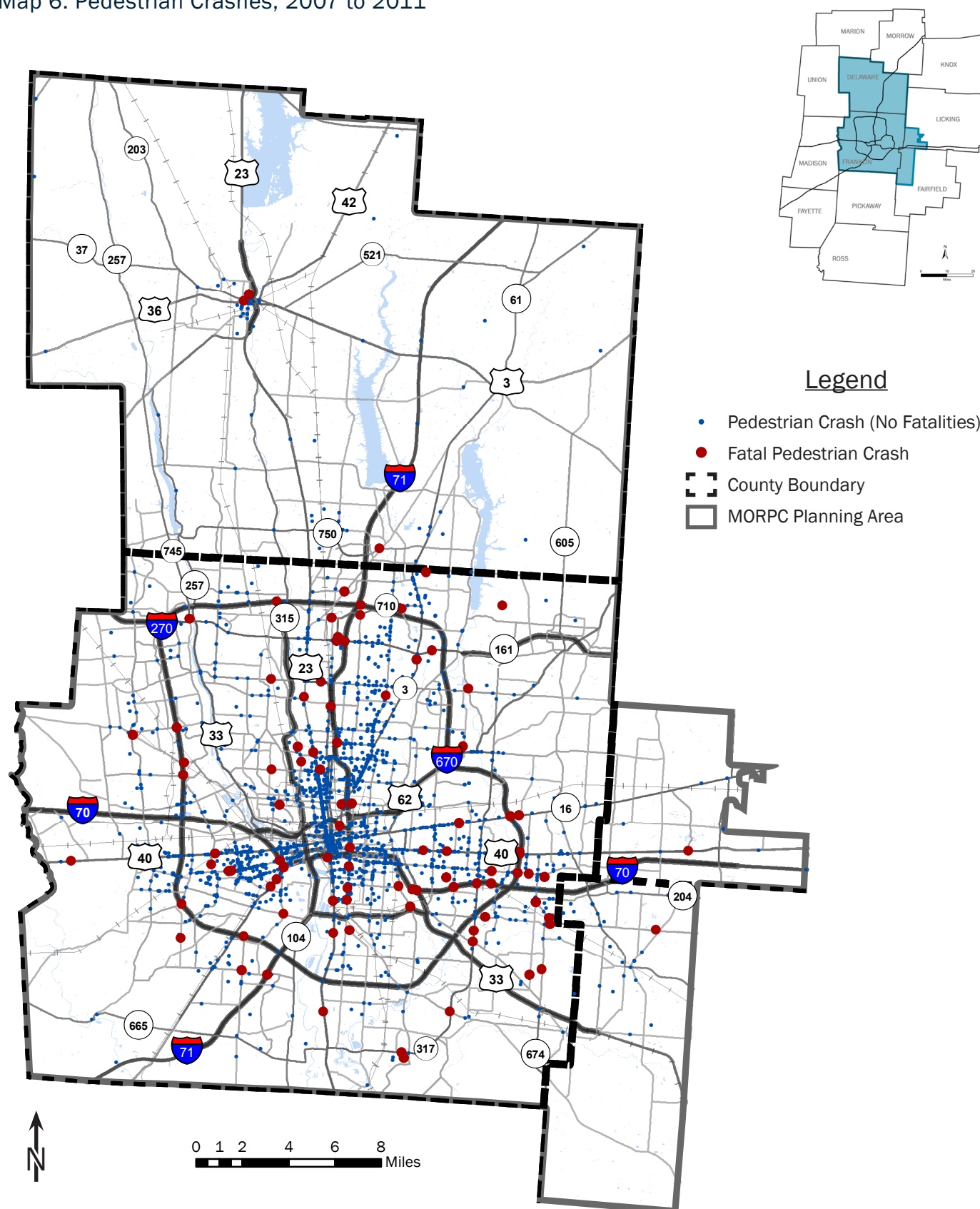
**Table 8. Pedestrian Crash Severity by Contributing Factor**

CONTRIBUTING FACTOR		CRASH SEVERITY				TOTAL CRASHES
		Fatal	Serious Injury	Minor Injury	No Injury	
PEDESTRIAN ERROR	Darting	10%	12%	9%	8%	10%
	Improper Crossing	24%	23%	16%	17%	18%
	Illegally In Roadway	25%	5%	3%	6%	5%
	Other Pedestrian Factors	13%	12%	9%	11%	10%
	Total (Pedestrian in Error)	71%	52%	38%	42%	42%
OTHER UNIT IN ERROR	Failure To Yield	4%	16%	25%	17%	22%
	Failure To Control	7%	5%	4%	7%	5%
	Negligent Vehicle Operation	1%	3%	3%	4%	3%
	Other Motorist Factors	21%	41%	54%	48%	50%
	Total (Driver in Error)	29%	48%	62%	58%	58%
TOTAL CRASHES		3%	15%	68%	13%	100%

#### Notes

- Percentages shown are based only on crashes with an 'at-fault' vehicle reported.
- Percentages shown refer to the portion of total crashes attributable to the contributing factor, for each severity level. For instance, 'darting' accounts for 10% of all fatal pedestrian crashes.
- Shaded yellow cells indicate the contributing factor with the highest value for each respective column, excluding grouped categories (other driver and pedestrian-related factors).

Map 6. Pedestrian Crashes, 2007 to 2011



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Source: ODPS/ODOT/MORPC

## BICYCLE CRASHES

Similar to pedestrians and motorcyclists, bicyclists are especially vulnerable in collisions with motor vehicles. The number of crashes reported in 2011 was down 30% compared to 2007. While it remains to be seen whether this trend indicates a lasting change, it does seem that, at the very least, the number of crashes is not increasing. Unfortunately, the injury rate shows little sign of improvement.

### Key Facts

- Around 9% of bicycle crashes result in a fatality or serious injury, compared to 2.3% of all crashes.
- Bicyclists 10 to 15 years old comprise the most common age range, accounting for close to 20% of all bicyclists involved in a crash.
- 'Failure to Yield' on the part of drivers and bicyclists is the leading cause of injuries resulting from bicycle crashes. Driver failure to yield accounts for 16% of serious injuries and 24% of minor injuries. Bicyclist failure to yield accounts for 13% and 16% of serious and minor injuries, respectively.
- Bicycle crashes that occur between 9pm and 6am account for only 15% of all crashes, but nearly 30% of all fatal and serious injury crashes.

Table 9. Bicycle Crashes by Severity, 2007-2011				
YEAR	CRASH SEVERITY		TOTAL CRASHES	FSI RATE
	Fatal	Serious Injury		
2007	1	31	308	10%
2008	3	23	283	9%
2009	2	25	292	9%
2010	2	21	305	8%
2011	1	24	214	12%
Total	9	124	1,402	9%

#### Notes

- FSI Rate = the percent of crashes that resulted in a fatal or serious injury.

Figure 18. Reported Bicycle Crashes by Time of Day and Severity

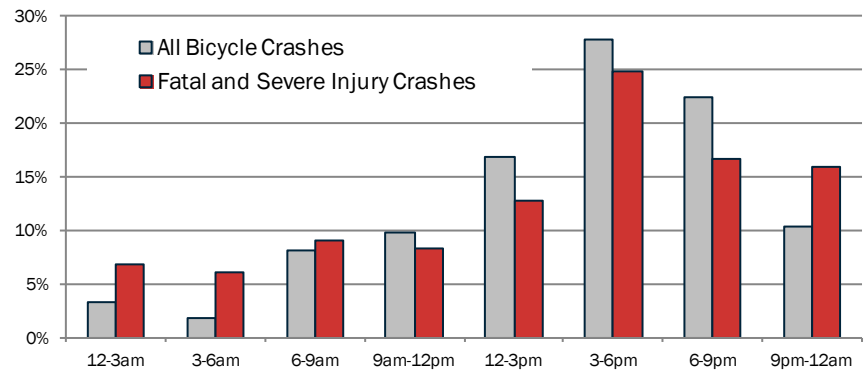


Figure 17. Average Annual Bicycle Crashes by Bicyclists' Age Range, 2007-2011

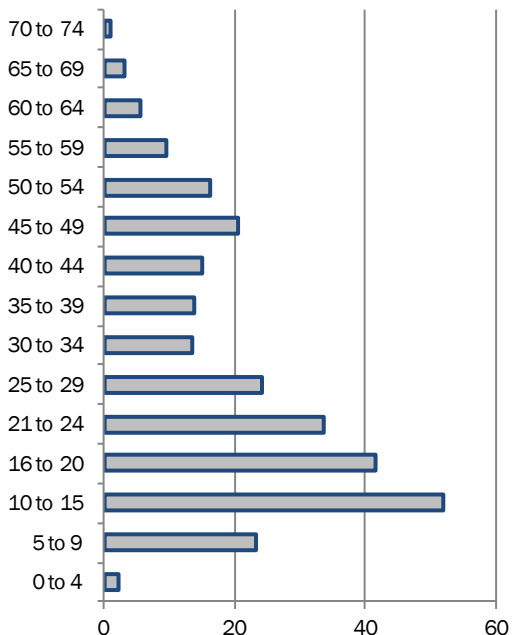


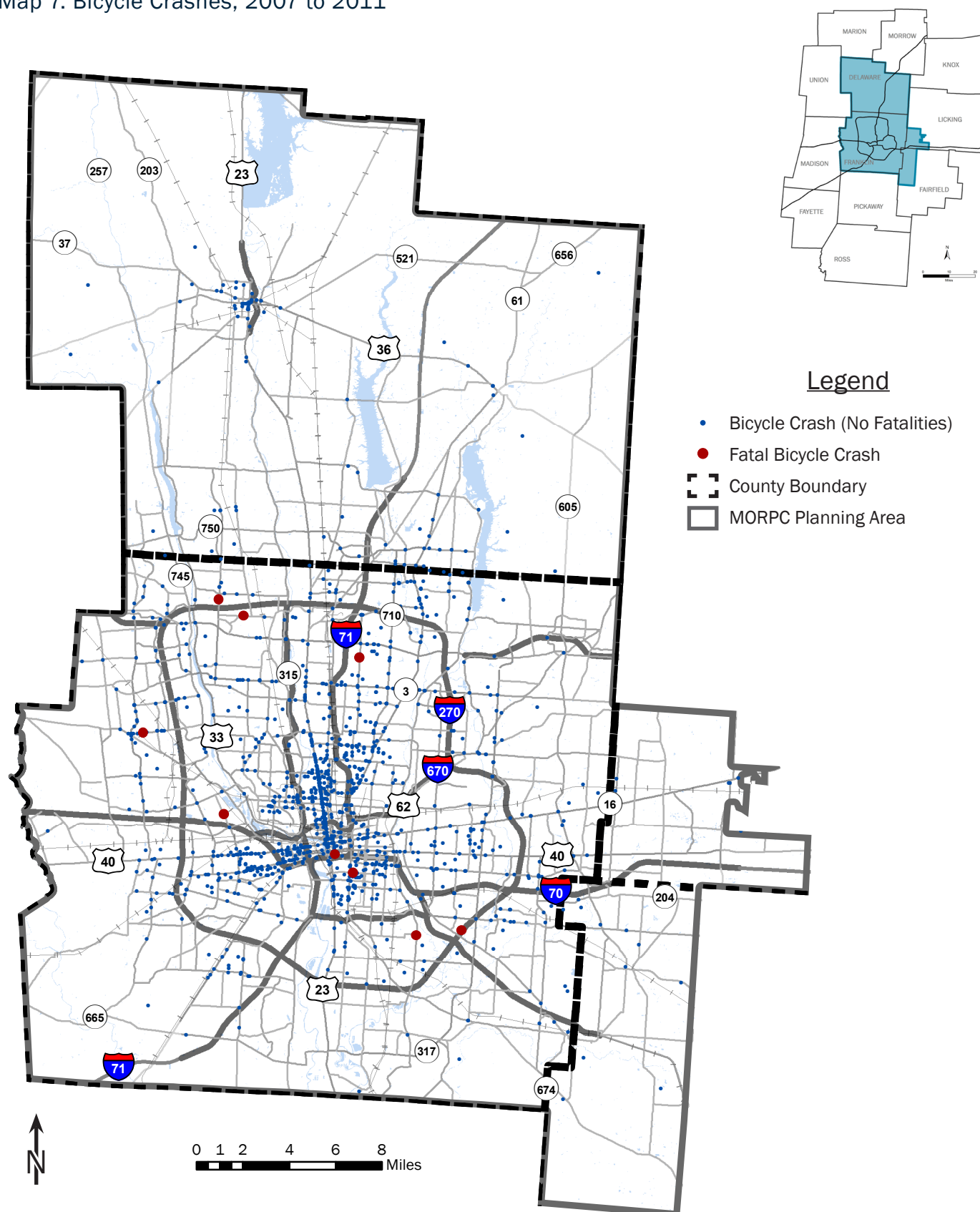
Table 10. Bicycle Crash Severity by Contributing Factor

CONTRIBUTING FACTOR		CRASH SEVERITY				TOTAL CRASHES
		Fatal Injury	Serious Injury	Minor Injury	No Injury	
BICYCLIST ERROR	Failure To Yield	20%	13%	16%	11%	12%
	Followed Too Closely/ACDA	0%	13%	10%	9%	10%
	Improper Turn	0%	12%	5%	7%	7%
	Other Factors	20%	24%	24%	21%	22%
	Total (Bicyclist in Error)	40%	63%	54%	48%	51%
OTHER UNIT IN ERROR	Failure To Yield	0%	16%	24%	30%	27%
	Followed Too Closely/ACDA	20%	4%	7%	3%	4%
	Improper Turn	0%	1%	2%	4%	3%
	Other Factors	40%	16%	14%	15%	15%
	Total (Other Unit in Error)	60%	37%	46%	52%	49%
TOTAL CRASHES		1%	10%	16%	73%	100%

#### Notes

- Percentages shown refer to the portion of total crashes attributable to the contributing factor for each severity level.
- Shaded yellow cells indicate the contributing factor with the highest value for each respective column, excluding grouped categories (other driver and pedestrian-related factors).

Map 7. Bicycle Crashes, 2007 to 2011



The information shown on this map is compiled from various sources available to us which we believe to be reliable.  
 N:\ArcGIS\CORE\O&M\Safety\Crash\_Fact\_Sheets\Crash\_Fact\_Sheets\_2007\_2011.mxd

Source: ODPS/ODOT/MORPC