Data Driven Approach To Crime And Traffic Enforcement
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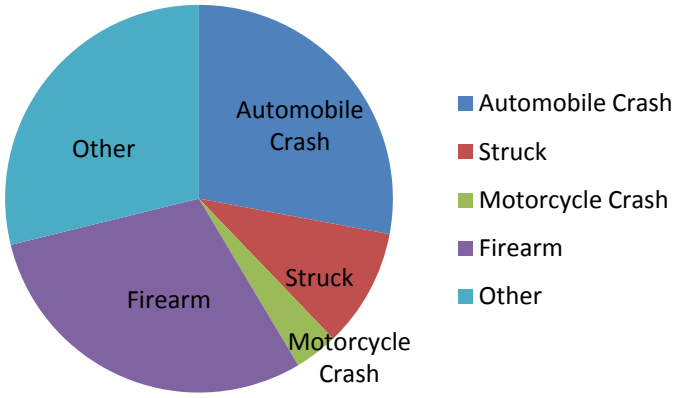
Law Enforcement Line-of-Duty Deaths

Preliminary data from the National Law Enforcement Officers Memorial Fund (NLEOMF) indicate a 4% decrease in raw numbers of officers killed in traffic-related incidents during 2013 (46 in 2013 compared to 48 in 2012) but a 1% increase when comparing traffic deaths to the total death ratio. Traffic-related incidents include automobile, motorcycle, and train crashes, as well as officers struck while outside their vehicles. In 2011, for the first time in 14 years, more officers died from firearms-related incidents than traffic-related incidents. The number of officers killed by firearms increased between 2009 and 2011, but has decreased in both 2012 and 2013. The most recent ten year period is broken down in the chart below.

Year	Total Officer Line-of-Duty Deaths	Total Traffic Line-of-Duty Deaths	% Traffic-Related Line-of-Duty Deaths
2004	165	74	45%
2005	162	65	40%
2006	156	73	47%
2007	191	85	45%
2008	142	72	51%
2009	124	52	42%
2010	161	70	43%
2011	169	61	36%
2012	121	48	40%
2013	111	46	41%

The year 2008 marked only the second time in United States history that more than 50% of officer fatalities in a single year involved traffic-related incidents. The numbers for 2013 are encouraging at 41%, the fourth lowest percentage in the last decade. The following graph shows the various causes of law enforcement officer deaths for 2013.

Law Enforcement Officer Deaths: 2013



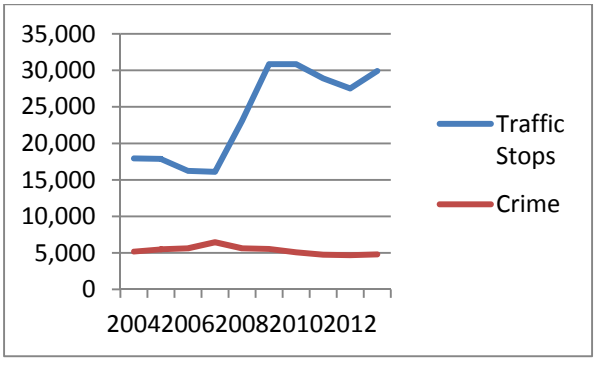
In the history of Joplin Police Department, three of the 19 police officer deaths have been traffic-related, which makes up 16% of total deaths. The State of Missouri has seen a total of 652 police officer deaths in the line-of-duty. Of those, 157 have been traffic-related, which equates to 24%. Nationally, including the very first police officer death that was ever recorded (1791) through 2013, more than 19,980 police officers have fallen in the line-of-duty. Of those, the total number of traffic-related deaths has not been found.

Relationship Between Traffic Enforcement and Crime

As is shown in the previous section, traffic enforcement is one of the more dangerous aspects of law enforcement. The following two graphs depict the historic relationship between the amount of traffic enforcement conducted and the crime rate. It can be seen that, prior to 2010, as traffic stops increased, crime decreased. Conversely, as traffic stops decreased, crime increased.

Year	Traffic Stops	% Inc/Dec Stops	Crime	% Inc/Dec Crime
2004	17,941	-	5,181	-
2005	17,859	-0.5%	5,495	+6%
2006	16,228	-9%	5,626	+2%
2007	16,098	-1%	6,453	+15%
2008	23,093	+43%	5,620	-13%
2009	30,846	+34%	5,540	-1%
2010	30,841	-0.02%	5,078	-8%
2011	28,907	-6%	4,746	-7%
2012	27,510	-5%	4,679	-1%
2013	29,903	+9%	4,803	+3%

Traffic Stops and Crime

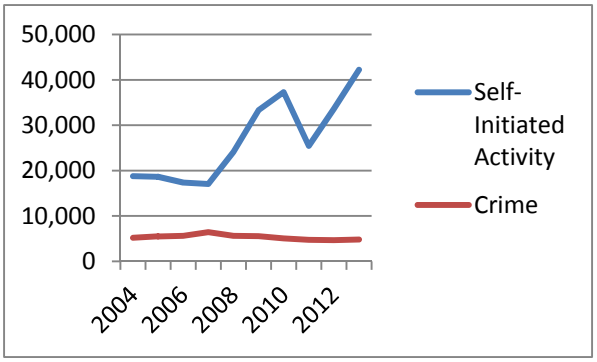


Relationship Between Self-Initiated Activity and Crime

As before, this section shows the relationship between two variables. In the previous section, an inverse relationship was established between traffic enforcement and crime prior to 2010. In this section, the two variables being compared are the more specific police officer self-initiated activity, which is primarily traffic, and the crime rate. For the purposes of this report, officer self-initiated activity includes car stops, follow-ups, pedestrian checks, and directed patrol. Both variables are shown in the graph below and indicate a historically inverse relationship as well.

Year	Self-Initiated Activity	% Inc/Dec Self-Initiated Activity	Crime	% Inc/Dec Crime
2004	18,764	-	5,181	-
2005	18,630	-1%	5,495	+6%
2006	17,355	-7%	5,626	+2%
2007	17,052	-2%	6,453	+15%
2008	24,087	+41%	5,620	-13%
2009	33,316	+38%	5,540	-1%
2010	37,303	+12%	5,078	-8%
2011	35,458	-5%	4,746	-7%
2012	33,635	-5%	4,679	-1%
2013	42,214	+26%	4,803	+3%

Self-Initiated Activity and Crime



Explaining the Relationship

To more clearly express the relationships between crime and traffic stops and crime and self-initiated activity, an average ratio of 4 to 1 can be established prior to 2010. This means as traffic stops increased incrementally by four, crime inversely reduced by approximately one increment. Or as traffic stops decreased incrementally by four, crime inversely increased by approximately one increment. The ratio is the same for self-initiated activity and crime. When there was an increase in self-initiated activities incrementally by four, crime decreased incrementally by one incident. Reciprocally, as there was an incremental decrease in self-initiated activity by four, crime increased incrementally by one incident.

So ideally, prior to 2010, as traffic stops and self-initiated activities increased, crime decreased. This is clearly indicated in the two previous tables that show the relationships between stops and crime and self-initiated activity and crime. Every year the number of car stops decreased, crime increased, or as stops increased, crime decreased (with the exception of the last four years, which will be addressed below). So the goal for law enforcement is to increase car stops and self-initiated activity in order to further reduce crime.

As mentioned in the previous paragraph, the years 2010-2013 are the clear exception. This report is predicated on historical data that has consistently shown an inverse relationship between traffic stops/self-initiated activity and crime since 2003 and perhaps beyond. In 2010-2012, both traffic stops and self-initiated activity declined without an expected commensurate increase in crime while 2013 brought an increase in traffic stops and self-initiated activity, but an increase in crime. It is worthy of mention that, while the tornado of 2011 reduced time for officers to engage in traffic stops and self-initiated activities, hundreds of officers from other jurisdictions aided Joplin in tornado recovery efforts. Therefore, the continued decrease in crime, despite reduction in traffic and self-initiated activity, was likely influenced by the presence of these additional officers. Although the tornado occurred in May 2011, the residual long-term effects likely had an impact well into 2012 as well. The effects of the tornado show a statistical anomaly that will require ongoing analysis of these changes.

Although data history for several years prior to 2010 clearly validates an inverse relationship theory, data from 2010 forward suggests that a reversal may be occurring. Further data analysis will be conducted in the coming year to determine whether this is an anomaly or a new dynamic, requiring new strategies.

Recommendations

The number of officers in an agency will not, by itself, create a reduction in crime. However, it is important to maintain an adequate officer-to-population ratio. The recommended ratio is 1.5 to 2.0 officers per 1,000 residents (*Crime Analysis: From First Report to Final Arrest by Steven Gottlieb, Sheldon Arenberg, and Raj Singh)*. This would mean that an adequate number of officers for Joplin would be 75 to 100. (This number does not take into account Joplin's disproportionate daytime population). Joplin currently employs 111 police officers and three reserve officers. So in showing that Joplin Police Department has an adequate officer-to-population ratio, the next area to look into is the aforementioned increase in traffic stops and self-initiated activities in order to reduce crime levels.

It is every police department's mission to serve and protect the citizens of its community. A reduction in crime levels is at the forefront of that mission. So if there are an adequate number of police officers serving the community, how can the department better serve its population in its goal of reducing crime? The answer lies in the organization of the department and the management of officers' time. Random patrol efforts produce random results. So more directed efforts should be made in order to achieve the desired results.

A police officer should ideally spend about 65%-75% of his or her time responding to calls for service and performing administrative duties such as report writing, testifying in court, eating, transporting prisoners, etc. The remaining 25%-35% should be uncommitted time (*Crime Analysis: From First Report to Final Arrest by Steven Gottlieb, Sheldon Arenberg, and Raj Singh)*. It is with this uncommitted time that officers can really make the difference in reducing crime levels and the aforementioned 4 to 1 ratio comes into play. It is also equally important administratively to distribute officers equitably among shifts and days of the week depending on the varying crime levels during these times. Beats might also need to be reconfigured based upon the percent of the total workload generated by each beat. The key is to provide discretionary time for officers to invest in the elimination of the root causes of crime.

The reconfiguring of beats actually took place in Joplin in October 2011 when, in the months following the tornado and the displacement of citizens to the north end of town, an additional beat was created to redistribute the workload. After these citizens moved back into the tornado area and other parts of town, we then removed that additional beat that was no longer needed in May 2013. This is a prime example of good decision-making at the administrative level for the purpose of utilizing officers' time in the most effective manner.

Quantifying Results of Traffic Stops

The everyday traffic work that officers perform is invaluable to every police department. Their work is the heart and soul of the department. An attempt to quantify the amount of activity resulting specifically from traffic stops is shown in the table below. It should be noted that contraband includes drugs, alcohol, paraphernalia, currency, weapons, and stolen property.

				As Result of Arrests				
Year	Total Traffic Stops	Crime	Drivers Arrested	Outstanding Warrant	Drug Violation	Offense Against Person	Property Crimes	Discovery of Contraband
2004	17,941	5,181	2,173	639	310	31	21	545
2005	17,859	5,495	1,977	544	286	47	25	501
2006	16,228	5,626	1,779	517	214	20	15	403
2007	16,098	6,453	1,501	471	193	23	33	349
2008	23,093	5,620	1,699	563	261	28	21	442
2009	30,846	5,540	2,217	740	310	19	25	537
2010	30,841	5,078	2,386	729	412	66	49	624
2011	28,907	4,746	2,505	884	354	61	63	648
2012	27,510	4,679	1,985	765	428	36	56	735
2013	29,903	4,803	2,345	857	475	38	57	744

In the previous table, the year 2004 stands out among the rest. During this year, the amount of activity generated from traffic stops was at its highest. This could very well be the result of having more veteran officers out on the street during that year. That theory goes right along with 2008-2013, years in which many new officers were hired and, though more traffic stops were made, the amount of activity generated from those stops has not increased at the same rate. To correct the issue of leveraging a car stop into something more, additional training for new officers has been conducted over the last few years and the results are paying off. Since 2009, the amount of activity generated from car stops has steadily increased every year, with the exception of 2012.

Crimes	2012	2013
Assault	439	372
Homicide	3	1
Rape	18	14
Robbery	65	52
Arson	23	12
Burglary	570	554
Larceny	2.027	1,994
Theft from Vehicle	676	811
Vandalism	619	742
Vehicle Theft	239	251
Total All Crime	4,679	4,803

Traffic Crashes	2012	2013
Fatality	6	6
All Injury	318	326
Property Damage Only	1,579	1,430
Total All Crashes	1,903	1,762