

# LAW ENFORCEMENT AND GEOGRAPHIC INFORMATION SYSTEMS

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## ABSTRACT

When looking at law enforcement and how they are able to be one step ahead of the criminals. What processes are being used? How are they able to understand spatial data and use GIS as a tool to stop or even prevent crime is a very important. Looking at the City of Fayetteville police department, the crime analysis department is using GIS to help the officers look for criminals, track crime statics and even prevent future crimes all with GIS. The officers understand that it is more than a map and the capabilities for them in their daily routines give them an advantage over the modern day criminal. Crime is just not about breaking and entering, murder and assault it is much more complex and being able to look at the different areas in the community to see the different crimes that are taking place is very important. By using GIS the officers are able to locate the criminals by the towers of the cell phone usage, also study the spatial patterns that might take place in a particular area and even map out a crime ring all by using GIS. This spatial tool is at the focus of meetings and how they are taking a spatial look at crime. When using maps in this type of process, the police are able to understand the nature of the crimes being committed and have evidence on what took place. GIS is the capturing, managing, analyzing and displaying information, this very system allows for criminals to be apprehend quicker, crime to be lowered and communities that have high levels of crime to have different programs in place to make the changes to stop these types of crimes from happen.

**Key words:** Law enforcement, GIS, Mapping, Crime, Crime Analysis, Criminals

## INTRODUCTION

Crime has always been around since the beginning of time. Depending on the different parts of the world a person might live in, it could dictate the time of punishment for a specific crime. If you look in history and go to the Biblical times, criminals were punished by the type of crime committed, such as an eye for eye, if you stole that hand in which you stole with would be cut off. Those types of punishments may seem a bit harsh for the modern times, which mean the different law enforcement agencies have to have different ways to punish the criminals. As times advance so did the criminals' have always felt they were one step ahead of the people in law enforcement. As technology advanced, criminals became harder to track, which in turn made the police officers jobs harder. How would the men and women in law enforcement begin to regain the upper hand against the modern criminal? What tools would they need to become the crime fighters of the 21<sup>st</sup> century, it would no longer be simple paper trails, late nights pinning pictures and details on a crime board, but with the use of GIS, it would change how officers do their daily jobs. GIS is Geographic Information Systems, this simple yet complex application, would allow technology to be at the officer's fingertips. GIS and the use of the Crime Analysis would assist in the officers and allow them to have a better understanding of technology and how to use it to track, prevent and see the trends in the areas in which they protect. In the city of Fayetteville, North Carolina, the police department is using GIS to improve how crime can be combated, with the use of modern technology.

## LAW ENFROCEMENT

Law enforcement is the name given to a specific type of police or public safety agency (Johnson, 1981). This agency can be local, state or national level. Depending on the type of agency it is and what level of crime they handle is in a hierarchy setting. Majority of the agencies work together for the common good of society's safety as a whole and are governed by a set of laws and rules on how to function as a whole. How the agencies are structured is based on the needs of the community and then it branches out on the state and national level, each of the agencies have specific departments and focus on different areas of crime, yet they report to one person with the facts, findings and the analytical assessments' of what needs to be done, to combat the war on crime.

### Law enforcement agencies

When you look at the different types of law enforcement agencies, there are five that are controlled by the government, yet they do have the abilities' to work with local agencies at different points in time. (DCIS) is the Defense Criminal Investigative Service; (ATF) the Bureau of Alcohol, Tobacco, Firearms and Explosives ;( FBI) Federal Bureau of Investigations ;( USMS) United States Marshals Service; (CIA) Central Intelligence Agency. These agencies tend to deal with the bigger crimes on a larger scale, which normally involves large groups of criminals (Carter, 2004). Law enforcement in which majority of the people is more familiar with is their local Police; they help the local communities in so many different ways.

### Police

The local police are primarily a body of persons empowered by the state to enforce the law, protect property and limit civil disorder (Wilson & McLaren, 1963). In the city of Fayetteville the Police department is a viable force, they have to communicate with the surrounding cities that are incased in the same county. In Fayetteville the police were looking for a new way to understand at crime and prevent along with seeing the trends. The city is dealing with different levels of crime and different types of criminals in the area. To understand what they are dealing with on a daily basis it is very important to learn and understand the mind of a criminal. Officers must take the time and study the different cases and figure out who, what, when, where and why the criminals are doing the crimes. Some of the crimes are self explanatory such as a drug user, stealing to get high, while others are very complex. The evolution of the modern criminal has come a long way and to understand the criminal is put the crime with them and focus on the cause patterns and trends, to form a sum what decent understanding. The questions all police ask "what is crime?"

## CRIME

Crime is a word that all know is something "Bad", people associate crime with someone who has no regard for the law, the person or business that the wrong has been done to. Criminals depending on the type of crime are not all bad or born to become criminals; there are different types of criminals, but to understand that you would have to become a criminal profiler. The word crime is very powerful, when you hear the word; it makes several different thoughts come to mind. What was the crime, who done the crime, has the person done this before, what was the reason, to name a few of the thoughts. The word crime in Latin root *cernō* meaning "I decide, I give judgment", in English the meaning is "sinfulness" (Reid, 1979). This poses a question, if in two different languages the word means sin, judgment, which follow suites with the way the justice system deals with crime and criminals .Crime in definition terms mean , a unlawful act punishable by the state, murder, rape, theft are the come universal types (Reid,1979). Even though there is no formal definition of crime, depending on the country the crime takes place, will dictate what the countries definition is. While every crime violates the law, not every violation of the law counts as a crime (Hart, 2012).

## CRIME ANALYSIS

A crime analysis is a function that provides analysis, identifying and analyzing patterns and trends in crime and civil disorders. The main functions is to provide crime reports , arrest reports and calls for service.(Santos,2012) In the city of Fayetteville the crime analysis department is very important to the officers, the reason being is because the information that is obtained . The officers can see the trends and patterns and better understand the area that they are patrolling. It allows for the officers to see the specific areas that they might need to focus on more and see if

crime is crossing over the different zones. Before the officers would have to spend hours trying to pull the reports and break down the same information, yet the crime analysis have a slight advantage because they are using GIS to put all the information on a map. Since using GIS, this allows a more visual account of the information that is needed.

### **Geographic Information System**

A definition is a statement that explains the meaning of a term. In learning any type of topic one must understand the word or the phrases to do the research on the topic. GIS is an acronym for a phrase, the formal term is Geographic information systems. As understanding the formal term, it does give a brief description of what the name means. If each part of the word was examined before knowing what the formal meaning was, it would start with Geographic. The word geographic deals with the concept of geography and the formal definitions of geography is the study of spatial variation, of how and why things differed from place to place on the surface of the earth, it furthers deals with geography, Geographic information systems is a system designed to capture, store, manipulate, analyze, manage, and present all types of geographical data, a simple definition would be it is a way of merging cartography, statistical analysis and database technology(von Lünen, Travis,2013). The usage for GIS depends on the type of spatial analysis, database, hardware and software being used. GIS applications allow the users to do queries, analyze spatial information, make corrections or add information to maps and present all of the results of the operations. GIS is not a computer system for making maps, even though it can create maps with different scale, projections and colors. It is an analytical tool allowing the user to identify the spatial relationships of map features. It only stores the data, allowing the user the ability to create the view to use for a specific purpose (Aronoff, 1989).

## **LAW ENFORCEMENT AND GEOGRAPHIC INFORMATION SYSTEMS**

In viewing the changes that the Fayetteville Police department is having since they are incorporating GIS is great improvements. The ability to look at the criminals and make a map of the crimes and see how they are connected on a map is a powerful tool and can be used in a court of law. Another benefit is that during the focus meetings each zone the different officers are working in, they have the ability to track the officers on duty, the number of crimes committed and they type. This gives the officers a better view and sees how to focus on the area and how to improve on the negative points. Now it is not limited to the officers on patrol daily, but it is being used by homicide also. In the department of Homicide, it is a very helpful tool; they are able to track cold cases. In this instance, they can make a timeline and map out to see how, the victims and the possible suspects or persons of interest can be mapped to show a possible connection. GIS training is being incorporated, so all of the officers understand what they are reading on the map and even how to display the information. Since the maps that GIS creates are allowed in court the way information is display is very important. What a officer is stating that is shown on the needs to be visible and can be understood by someone that has never used the system. GIS is allows for so many different functions as mapping cell phones, tracking GPS in a car , or other important information needed to prove their case. ESRI the leader in mapping software for companies has even created special software for Crime Analysis and law enforcement personnel. There is crime analysis, crime and investigative analysis, data fusion, in vehicle mobile mapping, traffic and accident analysis and corrections , parole and probation, these different applications that involve GIS is giving the men and woman of law enforcement the tools they need to prevent , control crime and track down criminals past and present. Majority of the police departments in the state of North Carolina have a crime analysis department, this is a growing field, because to understand the mapping and the different functions GIS can bring to the police is growing and changing daily.

## **CONCLUSION**

The time has come that what was done in the past can no longer be used in the future. Criminals are becoming smarter and they are now using technology , what are the police suppose to do? Should they just keep using the same methods of the past, or will they have to comply and move along with the times and see what resources are available to help them become the crime fighters of the 21<sup>st</sup> century. Law enforcement is a local, state

and national agency, even though the laws are different between each, they are still governed by the same set of principals, which is to protect and serve the citizens. Law enforcement no matter what branch has used maps to track/locate the suspects, since GIS is the capturing, managing, analyzing and displaying information, how can this be used to assist in law enforcement? Prior to using GIS, officers would have to do everything manually, which by time the information was in place, the possible suspect could be moved on to another area, or even committed another crime. In using GIS the officers have the ability to gather the information quickly, map out crimes that have happen, they could link the suspects to crimes and look at the patterns and trends to show the different types of crimes that have or will occur. As the City of Fayetteville Police department intern, I was able to see up close how important GIS is to the police. It was used in focus meetings to show what crimes were committed in the different zones, statics to show if crime was up or down. Maps were created weekly to show what would be the primary focus areas, they were also used to track criminals and look at where the criminals have been past and present. The combination of law enforcement and GIS for the city of Fayetteville and other police departments have improved how crime is handle. Officers now have the technology to combat what the criminals are doing and they are now becoming one step ahead. GIS is no longer just for mapping routes for a county map, state map, but it has become a powerful for tool to combat crime worldwide. Most would say how can a map be this powerful, but with the different functions that can be used and information that you can query the possibility is endless, and as technology because better, faster and the needs of law enforcement are being met , criminals do not stand a chance.

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