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Patrol Deployment through Crime Analysis

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ABSTRACT

Law enforcement typically uses tradition and perception as its basis for deployment of patrol resources versus a measurable statistical method such as crime analysis. The Montgomery County Sheriff's Department does not use crime analysis as the basis for its deployment and it is hypothesized that patrol response boundaries would change and service would become more effective if a scientific and measurable method were employed. Inquiries were made with departments that Montgomery County typically compares itself and with departments that use crime analysis for deployment, particularly the COMPSTAT model. The findings of the research indicate that the scientific method using crime analysis is an effective and measurable means as long as the data collected and being analyzed is current, the managers within the department are held accountable for crime control within their districts, and the use of crime mapping is incorporated into the system. The findings support the belief that the Montgomery County Sheriff's Department would experience improvements in patrol service if deployment of patrol personnel was made using crime analysis; however, it is uncertain whether the district boundaries would change without first implementing the program and locating crime zones and response barriers.

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INTRODUCTION

There are many non-scientific methods used to deploy law enforcement patrol personnel. Deployment refers to the staffing of shifts, beats, and patrol district boundaries, or any other type of division in human resources. Seemingly, the most common method used to deploy personnel is through management's perception of crime and the resulting staffing needs. The likely reasoning for this is that there are no up-front costs; managers feel they know where crime occurs most often, and the first line supervisors are aware when the workload is heavy.

A more scientific method for the division of resources is deployment through crime analysis. Crime analysis refers to the gathering of crime data and the subsequent statistical analysis is used to identify heavy crime zones, determine peak workload times, and assign the proper number of personnel to perform the services efficiently and effectively. Proper deployment can reduce overhead costs involving labor hours and determine the correct staffing levels to promote officer safety.

The Montgomery County Sheriff's Department (MCSD) bases its deployment on tradition and perception. The uniform patrol division is broken into four patrol districts; each district is then divided into two to four beats; and there are seven designated shifts with all possible combinations of assigned days off. The districts are divided based on tradition and geographic boundaries. Also taken into account are the Commissioner's Precinct boundaries which are based on population. The beats are divided based on geographic boundaries and the lines are designed to coincide with the mapping system used by the computer-aided dispatch (CAD). The mandatory shift levels vary in the districts and the district commanders set the minimums. The shifts are also designed to coincide with the CAD numbering system; however,

this standard is easily modified. Would improvements in patrol service occur and would the division lines currently drawn change if MCSD used crime analysis as the basis for deployment?

There are three regional law enforcement agencies to which Montgomery County government traditionally compares itself. These agencies are the Harris County Sheriff's Department, Houston Police Department, and Conroe Police Department. They will be surveyed to determine if they currently deploy patrol personnel using perception, crime analysis, or any other method. The survey will also encompass Texas municipal police departments that use crime analysis as a basis for deployment including San Antonio, Plano, Richardson, Arlington, El Paso, and Abilene Police. One of the most successful departments on a national level to use crime analysis for deployment is the New York City Police Department and its COMPSTAT (Anonymous, 2000) program. These departments will also be asked to share their methods of data collection, analysis, crime mapping, and statistical deployment.

The scientific method of deployment through analysis should be more effective than deployment based on tradition and perception alone. To be successful, the data that is gathered must be current and relevant to the task. Knowledgeable personnel must perform the analysis and the medium used to perform the analysis must be reliable. If these factors are in place, the most effective method for deployment will be through statistical analysis.

If the Montgomery County Sheriff's Department implements the use of analysis for deployment, they will serve as a baseline for implementation by other departments. The assessment of the program will serve as an experimental starting point for other similar departments that wish to move from deployment through tradition and perception to that of analysis. The accomplishments and failures can be a basis for other departments to begin their own programs.

REVIEW OF LITERATURE

Deploying patrol resources through crime analysis is a trend that supports immediate needs and provides for long-term solutions in response to crime, traffic problems, and disorder (Anonymous, 2000). There are three technological functions that are essential to the proper deployment of police resources. These three functions are: 1) Information Management or the Records Management System (RMS) database in which the law enforcement agency's data is stored, 2) computerized crime analysis, and 3) crime mapping (Anonymous, 2000). Most agencies use the first component, Information Management / Records Management System (RMS). The systems vary widely and are capable of performing functions on different levels of sophistication. The areas that seem to be most difficult to procure and are routinely missing from the equation are those of crime analysis and crime mapping. One of the most successful systems that perform the deployment through crime analysis model is the Computerized Statistics (COMPSTAT) program developed in New York City. This model uses all three technological components and has been hailed as the reason New York City was able to reduce their crime rates (Anonymous, 2000).

The RMS is the backbone and the first of the three components of technology used to deploy patrol resources through crime analysis. A law enforcement agency uses this computer system to store data related to reported crimes. In most instances, this database holds crime report information, persons data which includes wanted information, property data, calls for service, and numerous other records related fields. The RMS is generally a mainframe computer. The most efficient and desirable systems commonly used by large departments are those in which data are provided by a user-friendly means of downloading mainframe data to the

crime analysis application (Reuland, 1997). In order for the RMS to be effective in its purpose of providing the information necessary to perform crime analysis it must have timely data entry (Anonymous, 2000) and be able to capture the necessary information from the field report (Reuland, 1997).

The police report should be designed in a way that the initiating officer correctly gathers necessary information for analysis and makes use of varied fields such as fill-in-the-blank, checklists, and a short narrative. The reason for this type of formatting is that specific fields can be completed in the proper method that the analyst requires. The fields also make the information more accessible and create a system in which the analyst does not have to review a long and detailed narrative to search out the information. Police reports that are “narrative driven” provide a time consuming barrier to the efficient and timely entry of data. According to Reuland (1997), the basic data requirements are that the information be complete, reliable, relational, and timely.

The second technological component of crime analysis uses the RMS data to perform research functions. Crime analysis is defined as the collection and analysis of data pertaining to a criminal incident, offender, and target (Goldsmith, McGuire, Mollenkopf, & Ross, 2000). There are two types of crime analysis: tactical and strategic. Strategic analysis involves the collection and analysis of data over a period of several years while tactical involves pattern detection, linkage analysis for suspect-crime correlations, target profiling, and offender movement patterns (Goldsmith et al., 2000) using data collected during a shorter time period, usually measured in days. Tactical crime analysis is the method that would be used to make decisions regarding patrol resource deployment and would allow for regular adjustments based on recent crime data.

Tactical crime analysis involves analyzing data to develop information on the where, when, and how of crimes in order to assist officers and investigators in identifying and understanding specific and immediate crime problems (Osborne & Wernicke, 2003). The problems are translated into patterns that can then be used to make educated and fact based tactical deployment maneuvers. The short time frame this method uses further necessitates the requirement that the data being analyzed is accurate and timely (Goldsmith et al., 2000). The analysis patterns are not hampered by geography (Osborne & Wernicke, 2003); therefore, a more accurate assessment can occur. Deployment by perception uses the crime information that the individual police officer or supervisor actually witnesses or are informed about. A large barrier to that information exchange is the division of the response area into shifts, districts, and beats that make effective communication difficult and effective event perception impossible. Tactical analysis is able to make educated predictions about crime occurrences both past, present, and future with some degree of scientific reliability (Goldsmith et al., 2000).

The third technological component of deployment through crime analysis is crime mapping. Crime mapping has always been a component of modern policing even without the sophistication of computer technology. Maps have been hung on the walls of the police station with simple pins used to indicate the occurrence of crimes or the maps have been memorized by seasoned detectives that compile their own analytical information through experience (Block, Dabdoub, & Fregly, 1995). The modern computer model takes the linkage of events and carries it a step further. The computer analysis is a scientific function that removes the dependence on the memories and experience of police officers and adds a component of exactness correlated onto a map for easy viewing. The modern model has a clear and logical structure that explains to the law enforcement professional that *A* leads to *B* because of *C* (Block et al., 1995).

The Chicago Police Department uses computer based crime maps for what they call proactive management (Maltz, Gordon, & Friedman, 1990). Chicago decentralized their crime analysis functions and allowed district commanders to generate crime analysis based on not only reactive needs but also *proactive* ones. The information is then made available to the line officers in the form of reports and maps that are easy to understand and give the police officer a basis for patrol and guide his proactive time much more effectively (Maltz et al., 1990).

Technology has advanced greatly and has become an integral component of modern law enforcement departments (Pettinari, 1998) allowing the Police Department's managers to make immediate decisions regarding resource deployment using readily available access to crime analysis data. One of the most successful advances in technology has been the Computerized Statistics (COMPSTAT) model developed by the New York Police Department (NYPD) under former Chief William Bratton (Anonymous, 2000). NYPD boast a reduction by 41% in Uniform Crime Reports Statistics from the years 1993-1997 (Goldsmith et al., 2000). The system uses the technological components of crime analysis and factors in accountability for the police managers. The managers are given the information and statistics they need to effectively reduce and address the crime for the Precinct in which they command. If they are unable to fulfill their goals then they are removed from that position (Goldsmith et al., 2000). COMPSTAT has been used effectively in six major Texas cities with minor deviations or local "tweaking" from the original New York model (Anonymous, 2000). Most of these cities have large police agencies with a progressive mindset that embrace technology. The cities have also adopted their own titles for the COMPSTAT program and they are listed as follows: 1) San Antonio – MAP {Management Accountability Program}, 2) Plano – MANAGER {Management And Accountability through Geographic Review}, 3) Richardson – Results Directed Policing, 4)

Arlington – Operations Bureau Staff Meeting, 5) El Paso – SAC {Strategic Analysis of Crime},
6) Abilene – COMPSTAT.

METHODOLOGY

The question this research is attempting to answer is: Would improvements in patrol service occur and would the division lines currently drawn change if the Montgomery County Sheriff's Department used crime analysis as the basis for deployment? The proposed results of the research indicate that there are more efficient, measurable, and scientific methods for deployment of patrol personnel than the deployment by perception method currently being utilized. The method of inquiry is a telephone survey conducted with the three regional law enforcement agencies that Montgomery County typically compares itself to. The regional departments are the Harris County Sheriff's Department, Houston Police Department, and the Conroe Police Department. A second selection for the survey is the identified Texas municipalities that deploy their patrol resources based on crime analysis. The surveyed departments are the San Antonio, Plano, Richardson, Arlington, El Paso, and Abilene Police Departments.

The information garnered from the survey will be compiled to determine if the three technological components for effective deployment through crime analysis are in place and the success of the programs being used by the respective departments. The survey asked the departments if they are currently using crime analysis and the name of the program, if any. The survey asks questions regarding the success of their program and if they would recommend its use to other departments. Inquiry was made as to other methods that may have been used and their perceived success and failures. A question was posed regarding the inclusion of the three

components of crime analysis and the impact on the crime rate within the department. The three regional departments did respond to the survey and all of the six departments that were using crime analysis as identified through the review of literature responded.

FINDINGS

The findings of the research support the hypothesis that a more scientific approach is available to use as a basis for deployment of patrol personnel. All of the departments surveyed stated that they did use crime analysis as a component of its patrol deployment methods. All of the names of the programs varied but appeared to function in a similar nature to COMPSTAT. The programs also seemed intended to perform the same or similar functions. The programs were all based on the COMPSTAT model of holding patrol managers accountable for making effective decisions with the statistical information they had been given about the crime rates in their areas of responsibility. The statistical information is gathered by the crime analysts which become the foundation for regular COMPSTAT style meetings which are held with managers and command staff regarding the effectiveness of the patrol managers.

Harris County Sheriff's Department, one of the largest law enforcement departments in the nation, uses Microsoft Excel to sort their crime data from the computer-aided dispatch (CAD) system. Many departments use sophisticated and proprietary software designed for the specific purpose of analyzing crime. The systems are generally expensive and may not always work well with other software systems. The Microsoft Excel program is widely used for endless spreadsheet functions and would not hamper the department either in cost or compatibility. Harris County does use the COMPSTAT method of holding their managers responsible for crime incidents and monthly meetings are held in the COMPSTAT fashion.

All of the surveyed departments use the three components that the current literature suggests as necessary for successful deployment of patrol personnel using crime analysis. The three components are a Records Management System (RMS), crime mapping, and crime analysis. All of the surveyed departments do recommend that a department currently deploying its patrol resources by any means other than a scientific method based on statistical data should begin a program of their own. Some departments recommended their system and others simply recommended any system that is designed to accomplish the goal of statistical deployment.

There was concern in that none of the departments, other than San Antonio Police and Abilene Police, were able to state using real numbers whether the scientific method of deployment had caused a reduction in their crime rate. San Antonio created their crime analysis unit in the year 2000 and began the current crime analysis program in 2001. San Antonio had other possible contributing factors saying that they had experienced some issues related to a new police chief with a shift in focus and an increasingly young patrol division that were given aggressive orders by the chief. San Antonio had seen violent crime increase by 25% from the year 2000 to year 2001. A decrease was experienced the following year from 2001 to 2002 by 3%, which was the first year of their current program. There was then a small increase of 2% from 2002 to 2003. Property crime had similar trends with an increase of 19% from 2000 to 2001 and an increase of 6% from 2001 to 2002. Another increase was seen from 2002 to 2003 of 3%. San Antonio does give its Statistical Analysis and Mapping Unit a tremendous amount of credit for significantly slowing the increase in crime. San Antonio also encourages the patrol managers to address crime geographically and COMPSTAT meetings are held regularly to exchange information.

The Abilene Police Department was the only other department that was able to give any real numbers regarding their crime rate. Since the implementation of their COMPSTAT method of deployment, they have seen violent crimes decrease by 20%, burglaries decrease by 10%, and thefts decrease by 10%. El Paso police did not know if the crime rate had fallen because of their program called Strategic Analysis of Crime, which is a COMPSTAT based system. Their main focus is to inform the patrol commanders about crime issues and hold them accountable for addressing those issues. El Paso also conducts regular meetings regarding strategy and crime incident issues. The Arlington Police Department has a similar approach to that of El Paso. Arlington did not know if their program, which is called MANAGER, had a direct impact on the crime rate. Arlington's main focus is to provide recommendations to the patrol supervisors who are then charged with using the information to address any issues that have been identified.

The other departments did not know if their crime rate had fallen due to the use of crime analysis for deployment. The survey did not ask if the crime rate had fallen, only if the use of crime analysis for deployment had played a role in affecting the crime rate. It seemed odd that programs designed specifically for statistical analysis were unable to state their own effectiveness in statistical terms. An explanation might be that the departments are gathering the information through the use of their crime analysis programs and they are not informing the crime analysis units of the methods used by the managers and if the crime analysis could be credited with any successes or failures. It is also not clear if representatives from the crime analysis units are part of the COMPSTAT meetings, therefore limiting the information exchange. Another possible explanation is that the program is not considered as important as the concept that affecting the crime rate is the overall goal. The crime analysis units are but a spoke in the wheel and credit is not singled out to specific spokes but only to the wheel itself.

CONCLUSIONS

The deployment of patrol resources, specifically by the Montgomery County Sheriff's Department, is made through management's perceptions and the traditional boundaries honored by the department. Seemingly, there is a more effective and scientific method of patrol resource deployment. The question this research is designed to answer is: Would improvements in patrol service occur and would the division lines currently drawn change if MCSD used crime analysis as the basis for deployment? The belief of the author is that the answer to the question would be "yes."

The findings indicate a strong belief on the part of departments that use crime analysis for deployment of its patrol resources that the scientific model based on the components of a Records Management System (RMS), crime mapping, and crime analysis are necessary for effective patrol resource deployment. The use of crime analysis has proven successful in all of the departments surveyed and all of the departments use a derivative of the COMPSTAT model originally used by the New York Police Department. New York attributed COMPSTAT with its major reductions in crime.

The departments did not seem to view the individual programs as the sole source of credit for any reductions in crime that were experienced. The information gathered and analyzed by the crime analysis units is passed on to patrol commanders or managers and they are ultimately responsible for making personnel deployment decisions to address the crime issues in their area of responsibility. An important component is that the managers are held accountable for their decisions and they are responsible for addressing the issue. If they are unable to reduce the problem with the information they are given, they are dealt with by the department's

administration and sometimes transferred in search of a more effective manager. It seemed likely that the crime analysis units are an integral component in a process that involves all aspects of the department.

The findings of the research seem to support the belief that the Montgomery County Sheriff's Department would experience improvements in patrol service if deployment of patrol personnel was made using crime analysis. The original hypothesis questioned whether the district boundaries would be changed by the analysis. The answer seemed to be "maybe." The boundaries would not be addressed until enough information had been compiled and analyzed to determine if the traditional boundaries based loosely on the Commissioner's Precinct lines were the most effective lines. Geographic factors regarding highways and natural barriers still play a role in boundary lines. The most important aspect is that the lines will be supported by current hard data instead of perception and tradition.

Patrol managers would be charged with deploying their personnel and held accountable for their effectiveness. This requires that administration be flexible and that hard data supports the decisions made by the managers. The managers would be able to predict the level of response needed for shift deployment for specific days of the week and times of the day. This information is not currently available and greatly hinders the effectiveness of the managers.

The departments surveyed all had crime analysis programs in place and they were the agencies that were the basis of the findings. The scope could be widened to include departments that do not use crime analysis for deployment but the author feels that their data would not be reflective of any measurable or scientific approach. Crime analysis is generally used by larger and more progressive minded departments and those agencies were the intended focus of the research.

The research study is applicable to any department that wants to take a step forward with their deployment methods. The COMPSTAT program is a tested and proven method of patrol resource deployment and is far advanced from the methods of deployment through tradition and perception. The Montgomery County Sheriff's Department should attempt to expand its current resources to include crime analysis, specifically tactical crime analysis, for the basis of its resource deployment. Once the program is in place, its effectiveness can be studied and the positive functions can be applied to local agencies that share data with MCSO. Local agencies have boundaries to which criminals do not adhere. Sharing of information and effectiveness by all involved will ultimately benefit all participants.

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