

The Miami Intelligence and Analytics Enhancement Project

Final Report

Strategies for Policing Innovation

Bureau of Justice Assistance, U.S. Department of Justice

October 1, 2019

Submitted by

Dr. Rob T. Guerette
Joelle Lee-Silcox
Kimberly Przeszlowski
Florida International University

Major Jose Rodriguez
Lt. Jaime Ramirez
Miami Police Department

Table of Contents

Executive Summary.....	iv
Targeted Problem.....	1
Community Outreach and Collaboration.....	9
Strategies Employed.....	12
Data and Intelligence.....	19
Analysis and Evaluation.....	23
Integration and Sustainability.....	34
Summary and Conclusion.....	38
References.....	41
Appendix A: Example Enhanced Crime Analysis Bulletin.....	42
Appendix B: Internal Survey of Crime Analysis Performance.....	43

List of Tables and Figures

Table 1. Overview of MIA Crime Analysis Training Activities Under SPI Project.....	13
Table 2. Overview of Internal MPD Administrator Survey Respondents.....	27
Table 3. MIA Enhancements Pre-Post Changes and Effect Sizes.....	31
Table 4. Larceny to Motor Vehicle by Month, Year and Percent Change.....	32
Table 5. Targeted NET-Micro Area Intervention Impacts.....	33
Figure 1. Theft from Motor Vehicle Concentrations, June 07, 2017 to April 30, 2018.....	6
Figure 2. City of Miami Theft from Vehicles, District and Net	7
Figure 3. City of Miami Theft from Vehicles, Net and Zones	8
Figure 4. Pre-Post Assessment Outcomes of Fundamentals in Crime Analysis.....	24
Figure 5. Pre-Post Assessment Outcomes of Crime Analysis for Problem-Solvers.....	25
Figure 6. Usefulness of Crime Analysis Bulletins Reported by MPD Administrators.....	28
Figure 7. Responses to Whether Crime Analysis Work Products Had Been Improved.....	29
Figure 8. Extent of Overall Satisfaction with the Crime Analysis Work Products.....	30
Figure 9. Larceny to Motor Vehicles by Month and Year, July 2017 to June 2019.....	32

Executive Summary

The MIA-SPI project was devoted primarily to enhancing and improving the analytical capacity within the Miami Police Department. The primary goal of the project was to better utilize the vast troves of data repositories to produce information that could be utilized by police commanders and detectives to inform operational decision-making. A secondary goal of the project was to employ a Problem-Oriented Policing and Situational Crime Prevention framework to address the chronic problem of theft-from-motor vehicles which had plagued the city and the South Florida community. This problem-solving initiative would also serve as a demonstration project within the department to both showcase how data could be used and to identify opportunities for improving internal data systems.

Strategies Employed

The project consisted of a collaboration between researchers from Florida International University and the Miami Police Department. The research component was comprised of one experienced criminology faculty member and two doctoral students, the latter whom were embedded within the crime analysis unit and worked alongside crime analysts. The project also relied on hiring an external data engineer consultant to assist in improving the data systems. The primary goal of enhancing the analytical capacity of the MPD crime analysis unit was achieved through 1) sequential formal training modules, 2) informal internal training and coaching, as well as through 3) restructuring of software data systems. The second goal of targeting theft from motor vehicles was used as a platform for informing the development of the analytical processes and systems within the crime analysis unit. The tactics employed in each of the problem areas were based on crime analyses which utilized the crime triangle and other heuristics in Problem-Oriented Policing and Situational Crime Prevention as well as what was learned in the broader literature of

tactics that had been utilized with some evidence of success elsewhere. Some of the tactics identified included deployment of CCTV cameras, focused patrols, increased officer presence, deployment of license plate readers, focused task force operations, creation of a dedicated motor vehicle theft detective unit, and insertion of barricades. The implementation of prevention tactics targeting thefts from vehicles remains in progress.

Analysis & Evaluation

Impact measures collected in the evaluation of the project indicate that the initiative substantially improved the analytical knowledge and skills of the analysts and significantly increased the extent to which crime analysis work products are used by MPD administrators and detectives to inform operational decision-making. *Pre and post knowledge tests of analysts surrounding formal training sessions showed a 25 to 53 percent improvement in testing scores. Further, an approximated before and after assessment of administrators found that analytical work products went from being used never or only occasionally, to now being used about 1 to 2 times per week on average.* This signifies a remarkable achievement in the transformation of the crime analysis unit which is furthering the integral use of data derived information in the performance of policing operations within the MPD. As the secondary goal of the project devoted to reducing theft from motor vehicles remains in the implementation phase, impact results of that aspect of the project remain inconclusive. *Preliminary analysis, however, indicates an abrupt discontinuous effect in the first part of 2018 which was potentially attributable to project activities.*

Integration & Sustainability

As a result of the MIA-SPI project, several changes have been made within the Miami Police Department. These changes fall within two general classes: those related to organizational units and those related to data structures and procedures. These include the centralizing of

analytical functions within one crime analysis and intelligence unit, creation of street crime and detective units devoted to addressing thefts from motor vehicles, overhauling of data and software systems, automation of certain data processing tasks, and improved data collection thresholds.

Aspects of the MIA-SPI project which the MPD intends on sustaining includes the greater production, dissemination and use of analytical information to inform operational decision making and the continued embeddedness of doctoral students working alongside crime analysts. Building from the analytical foundation achieved here, the MPD also plans to facilitate additional modernizations such as intelligence-led and a real time crime information center which further exemplifies how the Department intends to transition and sustain the strengthened skills of the analyst unit into future operations.

Targeted Problem

The primary objective (#1) of the Miami Intelligence and Analytics Project (MIA) was to build the internal capacity of the Miami Police Department in order to transform the vast troves of accumulated data into usable operational information. Suffering from high turnover of command level staff in recent years largely due to retirements, the department found itself continually falling behind as advancements in technology, software, and analytical approaches within policing continued to evolve nationally and internationally. Rapid advancements in police technology and the exponential growth of available data sources had increased the technical demands on analysts. The department found itself without a practical understanding of geographic information systems (GIS), database structure, query building, and statistical methods which had all become required skill sets of today's analysts. The lack of any in-house training regimen (formal or informal) had left the analyst unit without the necessary skills needed to accomplish their jobs. This resulted in an environment where very little actionable intelligence was produced, and analytical output was mostly clerical and generic rather than specific and useful. The broader utility of this report stems from anecdotal evidence that suggests other departments may be facing similar barriers to success.

The original intention was to adopt and develop predictive analytical software systems as a "quick fix" to improve the supply of information in support of operational decision making. After reviewing evaluation evidence and presentations on various software systems available, the department decided instead to invest heavily in the development of human capital and data systems within the crime analysis unit of the police department. This alternative direction was decided both because of the cost involved and it was believed that establishing a broader foundation for crime analysis would better facilitate the development of police activities which required more competent analytical abilities within the department. Thus, the aim was to create a formidable

platform which could serve as a foundation in the harvesting, analyzing, and dissemination of usable information for police administrators and detectives. This new direction delivered new training to crime analysts, hired staff with advanced analytical skills, and revamped and integrated both internal and external data systems.

This objective was facilitated by partnering with criminologists from Florida International University (FIU), to assist in the delivery of training for crime analysts and creating an ongoing partnership where criminology PhD students worked embedded within the crime analysis unit and assisted analysts and investigators to develop analytical reports and actionable intelligence. A secondary objective (#2) of the MIA project was to target the chronic problem of theft-from-motor vehicles as a means of testing and showcasing the newly developed analytical tools of the crime analysis unit through a Problem-Oriented Policing and Situational Crime Prevention approach. Thefts from vehicles had persisted as the “life blood” of crime throughout South Florida and Miami for many years resulting in the accumulation of thousands of victimizations affecting both residents and tourists alike.

Advances in Crime Analysis

The crime analyst role in policing has experienced tremendous growth in recent years. Though the term “crime analysis” has been known to law enforcement since 1963 (Gottlieb & Arenberg, 1991), the formalized process of analyzing crime and incorporating specialized units into police operations is still a relatively new phenomenon. In accordance with the International Association of Crime Analysts (2014), crime analysis is defined as a profession that employs quantitative and qualitative methods to analyze data valuable to police operations. Crime analysis is not anecdotal in nature, but rather heavily reliant on theory and on the application of adequate data collection procedures, statistical techniques and advanced analytical software (Santos, 2016).

Further, crime analysis plays a fundamental role in the implementation of both evidence-based approaches and the organizational models that facilitate such practices, such as problem-oriented policing, hot spots policing and stratified policing (Santos, 2018), among others.

As evidence of this trend, the last twenty years mark an ever-increasing prevalence of crime analysis positions, particularly across mid- to large sized police departments. However, true institutionalization of a crime analysis units requires an organizational culture in which data and evidence are either normative or at the front-end of decision-making (Dolly & Sawver, 2018). Data that is produced by a crime analysis unit but not consumed by police personnel, may insinuate a disconnect in the overall organization structure. A commonly documented impediment to the fluid integration of such a unit deals largely with the internal misconception that analysts are associated with secretarial functions in which data is collected for crime reporting purposes rather than for police operations.

The modern-day crime analysis function exemplifies an evolution in terms of analytical capacity. This has been facilitated both by enormously improved technological systems as well as advancing perspectives in approaches to modern day policing. For instance, the evidence-based policy movement has led to an increased reliance on these analytical units to not only yield usable knowledge, but likewise aid in interpreting and producing evaluations of policing initiatives given their access to advanced analytical software and information systems. This often requires specialized knowledge of sound scientific methods not historically housed within policing organizations. The establishment of scientific researcher-police partnerships may expedite the transition from an administrative and reactive crime analyst unit to one that is intelligence-led, data-driven and placed at the forefront of the police response to crime (see Guerette, Lee-Silcox, & Przeszlowski, 2019).

Problem-Oriented Policing, Situational Crime Prevention & Theft from Motor Vehicles

Problem-Oriented Policing (POP), involves the development and sustainability of adequate research techniques to analyze lingering crime problems or instances of disorder and the evaluation of the effectiveness of police responses (Goldstein, 1990). Though an integral component of a crime analysis unit, the overall scope of problem-analysis is considered much broader as it not only provides support to police practices but can also drive organizational change in terms of evidence-based approaches (Boba, 2003). An impediment to the implementation of Problem-Oriented Policing is frequently associated with the difficulty in departing from a traditional approach to policing. Specifically, the transition from traditional reactive crime responses of dubious value to long-term and preventative responses that stem from methodologically and statistically sound analysis of crime incidents (Clarke and Goldstein, 2003). The SARA model (Eck and Spelman, 1987), which is comprised of the sequential application of scanning, analysis, response and assessment, has been of great value in terms of assimilating the philosophy into daily police operations.

A complimentary approach to POP is Situational Crime Prevention (SCP) which follows a similar SARA process and places greater emphasis on understanding the underlying opportunity structures responsible for crime problems and the identification of possible environmental manipulations which might minimize those opportunities and thereby reduce crime (Clarke, 1997). The two approaches of POP and SCP are so compatible they are often represented equally within the prolific history of problem-solving projects which have been accumulated from around the world (see <https://popcenter.asu.edu/content/pop-projects>). *Each place great emphasis and require in-depth crime and problem analysis*, as well as the accumulated understanding of the usefulness of techniques and strategies which have been implemented elsewhere. While the MPD

has a rich history and commitment to community policing and problem-solving, the integration of problem analysis functions within the crime analysis unit had not previously been done. The carrying out of a problem-solving project within the same process of overhauling the data systems and enhancing the unit's analytical capacity allowed for identification of needed information to be included in new data processes and to showcase within the department the level of analysis which could be achieved.

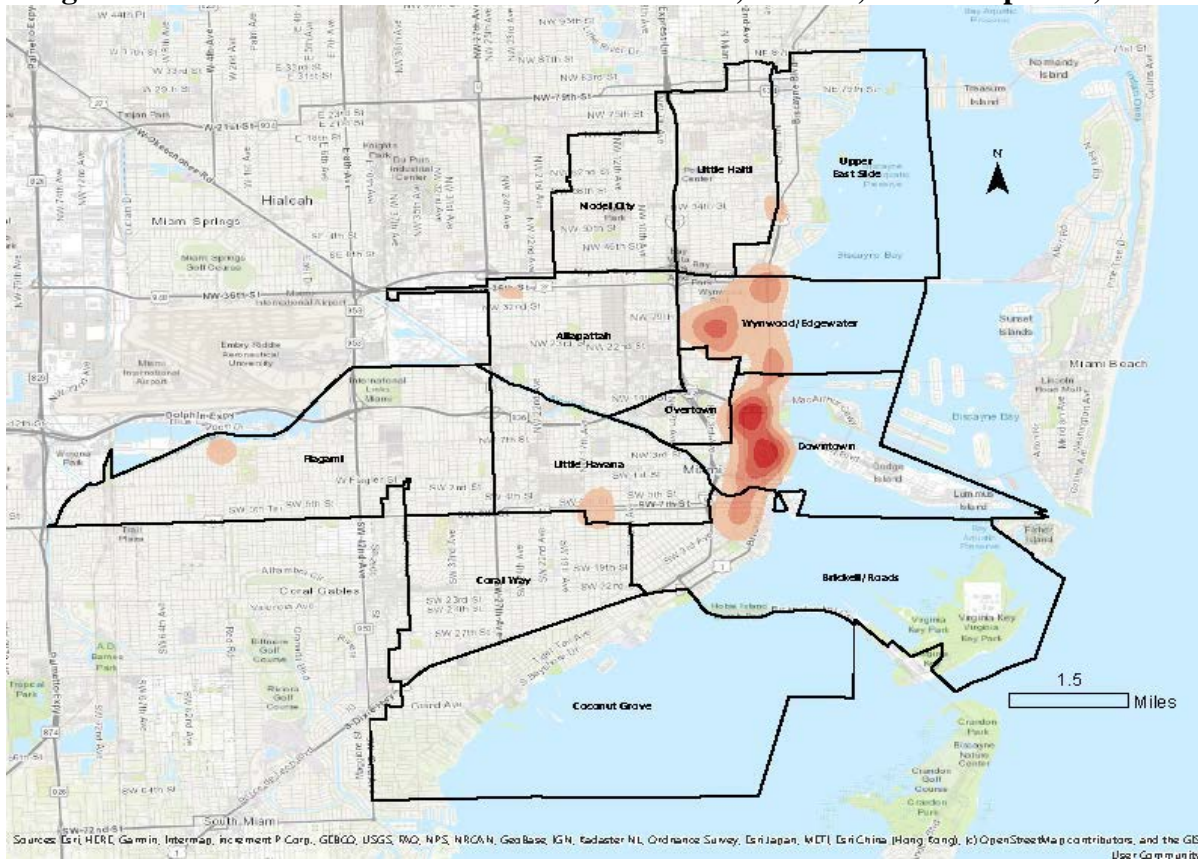
Within POP and SCP approaches much has been documented in regard to the nature and the various tactics available for dealing with thefts from motor vehicles which informed the MIA project. These have been outlined in two guides produced by the Center for Problem-Oriented Policing, Clarke's (2002), *Thefts of and from Cars in Parking Facilities*, and Keister's (2007) *Thefts of and from Cars on Residential Streets and Driveways*. Though not an exhaustive listing, the empirically evaluated and crime-specific strategies identified in the literature reported within both guides included the use of CCTV cameras, improvements to lighting at parking locations, deployment of targeted patrols, use of awareness and educational campaigns, and the insertion of access barriers, among others.

Theft from Motor Vehicles in Miami

Theft from motor vehicles is both widespread and frequent in Miami. Theft from motor vehicle was selected as the focus of the initiative both because it was viewed as a facilitator for other crime and disorder problems within the city (i.e., drug abuse, homelessness) and because the crimes affected both city residents and tourists who comprise a significant contribution of revenue for the city. For calendar year 2017 the number of thefts was 3367, with an increase to 5802 in 2018. From June 16, 2017 to June 16, 2018 the city experienced some 6,061 incidents. Theft from motor vehicle was selected as the focus of the initiative both because it was viewed as a facilitator

for other crime and disorder problems within the city (i.e., drug abuse, homelessness) and because the crimes effected both city residents and tourists who comprise a significant contribution of revenue for the city. Yet, though widespread, some areas experienced disproportionately greater volume than others. Several concentrations are evident (see Figure 1).¹ At the district level, most thefts occur in Central and South (43% and 41%, respectively). Within these, thefts are disproportionately concentrated in three neighborhood or NET areas: Downtown, Wynwood, and Flagami (see Figure 2).

Figure 1. Theft from Motor Vehicle Concentrations, June 07, 2017 to April 30, 2018



¹ MPD breaks down into three Districts (North, Central, and South), within each of these Districts are Neighborhood Enhancement Team (NET) Areas which are then broken out into zones and then further broken down into reporting areas. Reporting areas roughly constitute a 4x4 block area and each zone can have up to 6 reporting areas.

Further analysis of these concentrations also reveals that the distribution of thefts approximates an 80/20 pattern (see Clarke and Eck, 2005). For instance, just 3 (25%) of the most problematic NET areas accounted for 46% of all thefts from motor vehicles in Miami. Just one of the most problematic NET areas represented 17% of operational areas yet produced 31 percent of thefts for the entire city. Within those problem districts similar patterns are evident across reporting areas (see Figure 3). Within the Central District, Downtown and Wynwood combine to account for 72.5 percent of the overall thefts in that District. Within those, just 5 reporting areas represent 79.52 percent of all thefts in the Downtown NET.

Figure 2.

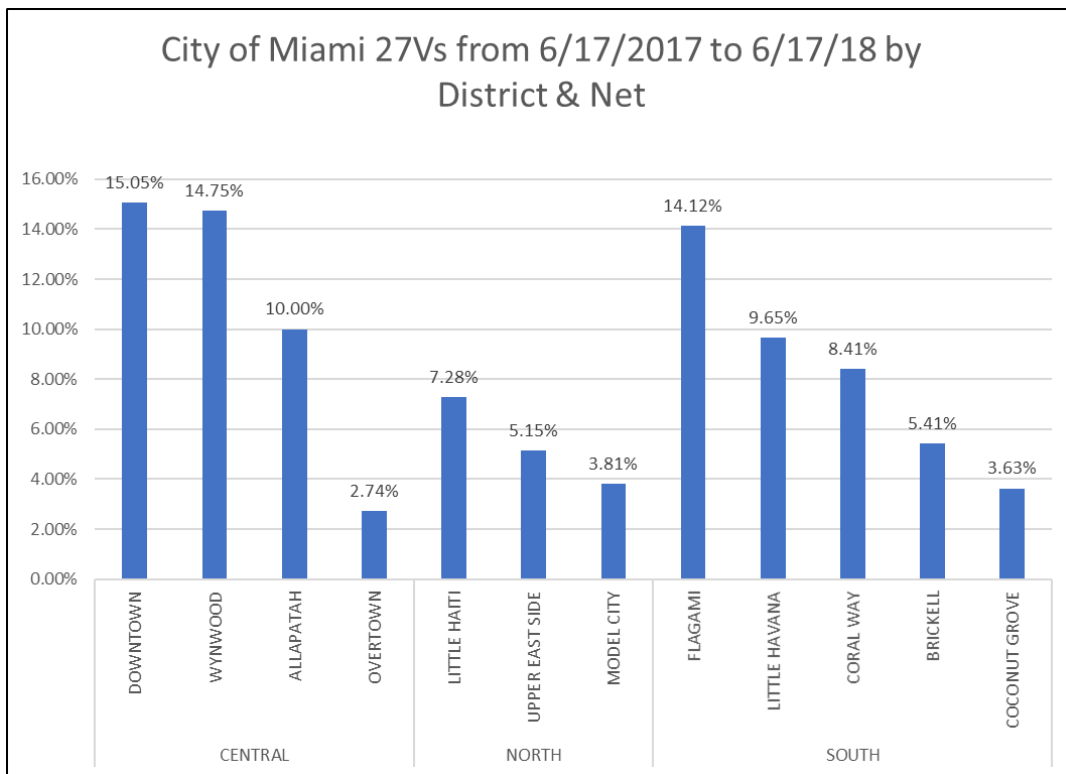
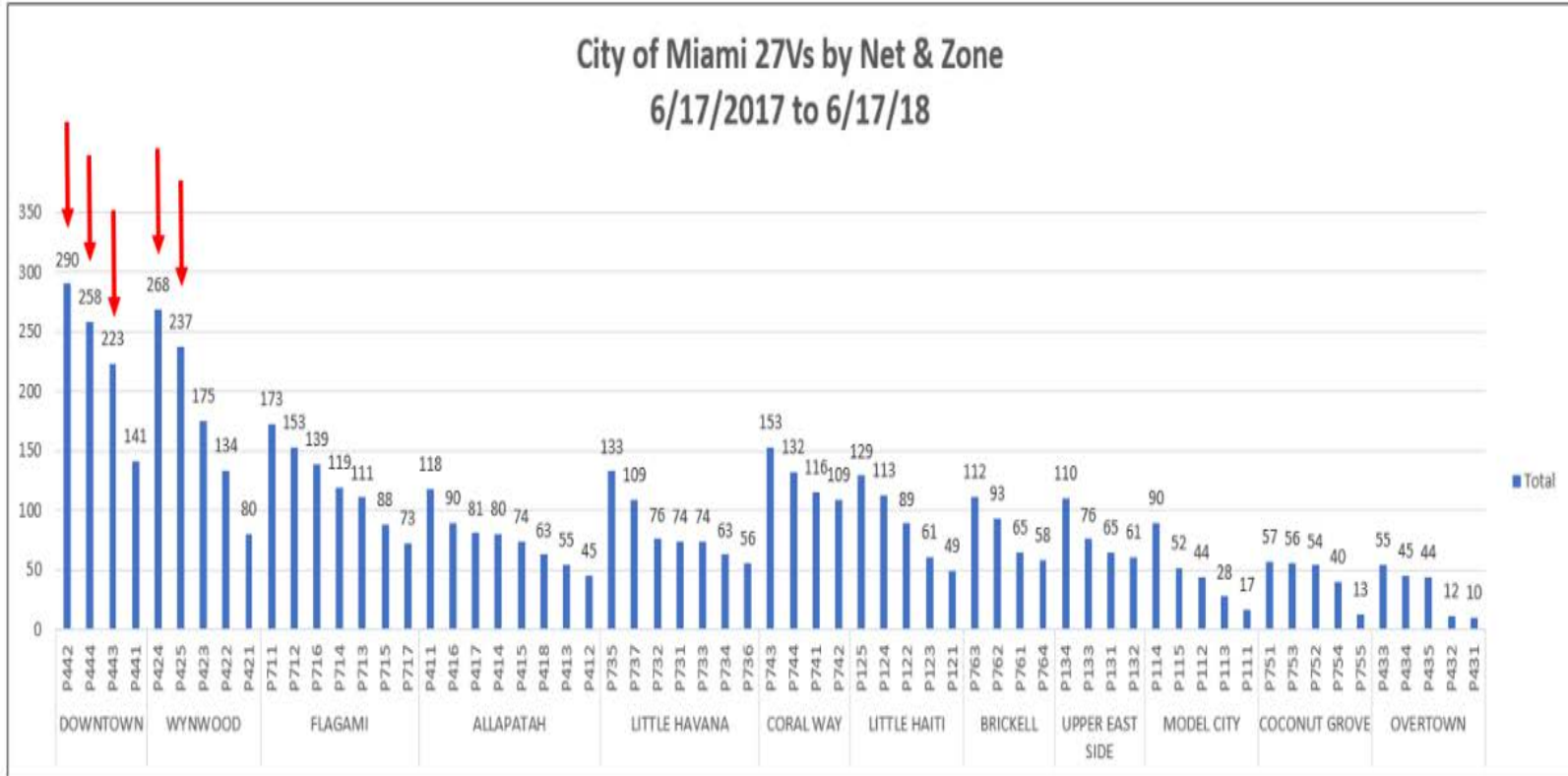


Figure 3.



Taken together these patterns identified opportunities for intervention and were utilized for focusing problem-solving efforts. Focusing preventive responses in those areas offered the greatest opportunity for the efficient allocation of resources along with the promise of most effect. Within those trouble areas more in depth problem analyses were conducted which relied upon the crime triangle in order to better inform relevant possibilities for preventive response. In addition to field site visits for observations and patrol ride longs by the analytical team, the information collected and analyzed for each problem area included the following:

- Incident Information: report number, reported date and time, start date and time, end date and time, District, NET, Zone, Reporting Area, signal, narrative.
- Place: address of incident, location type (deck, lot, street, residential), repeat locations
- Victim: number of victims, gender, race/ethnicity, age, address, visiting? from?
- Property Taken: ID/Passport, cash, credit cards, electronics, jewelry, purse/wallet/backpack, luggage, firearm, air bag, personal effects, approximate cost of property.
- Target Vehicle: make, model, year, color, type of vehicle (car, SUV, van, truck, other), method of entry, rental car or out-of-state tags, rental car company.
- Offender(s): (Arrested or suspects): gender, race/ethnicity, address, age, associated incidents.

Community Outreach and Collaboration

The MIA project was carried out through a collaboration between the Miami Police Department and Florida International University (FIU), South Florida's public research university. The university research team consisted of a faculty member with expertise in problem-oriented

policing, situational crime prevention, crime analysis, and program and policy evaluation.² It also included two doctoral students from the FIU Department of Criminology & Criminal Justice, International Crime & Justice Doctoral program. The doctoral students worked embedded within the crime analysis unit at the Police Department in lieu of their research responsibility to the university. Each student was assigned to the Police Department for 20 hours per week with biweekly meetings with the faculty member. Doctoral students were provided desks and computers to work side-by-side with crime and intelligence analysts.

Within the Miami Police Department, the project was sanctioned, endorsed and facilitated by the Chiefs office and was governed by the Major in charge of the crime analysis unit who was also in charge of the investigative units within the Department. Under the Major's command, a Lieutenant and Sergeant were assigned to oversee and manage the weekly activities of the doctoral students within the crime analysis unit. Additionally, a data engineer was brought in as a private consultant to work in-house with the doctoral students and the crime analysts.

The SPI project built on a previous long-standing collaborative relationship between FIU and the MPD. The project formalized this collaborative partnership with the integration of doctoral students working embedded within the crime analysis unit. The research team had five primary tasks: 1) to facilitate analytical training among analysts, 2) to provide support and insight to daily analytical reports, 3) to assist in the overhaul and restructuring of the Department's data systems, 4) to lead the problem solving process in targeting theft from motor vehicles, and 5) to provide the final assessment and overall evaluation of the project. Within this, the research team facilitated implementation of specific training modules, fostered the sharing of ideas related to improved

² The faculty member has a prior relationship with the department on efforts involving problem-solving training and assessments within the department as well as several grant seeking initiatives.

analytical techniques, conducted informal instruction on specialized software, data visualization, analytical approaches, and provided more general ongoing assistance and support.

The MPD management team provided critical guidance and support for the research team and assisted in arranging meetings with other internal units as necessary. The MPD team also frequently requested assistance of the doctoral students to work in support of the analysts in specific analytical assignments. This welcoming and inclusive posture helped to fuse the partnership and served to identify the research team as an integral component of the Department. The data engineer worked closely with the analysts and research team to better understand the data needs of the unit and worked to both automate many of the units' routine functions as well as make more readily accessible specific data variables needed by the analysts to improve their work products.

Within the police department the project achieved support and "buy-in" across several internal units (i.e. detectives, NET and task force commanders, community resource officers). This was partially due to the demonstration of enhanced analytical products that the crime analysis unit began to produce in which other units readily identified their value and usefulness for their own units' responsibilities. Buy-in was also facilitated through an overall cultural shift within the Department led by the Chief's office, which stressed and emphasized the importance of information and analysis in determining appropriate police action. This emphasis was continually showcased in monthly COMPstat meetings. It's also important to note that over the course of this SPI project there was considerable turnover in its management within the Police Department. Although several individuals were reassigned, the general command structure outlined previously remained mostly intact. The project survived these transitions both because of the leadership of the Chief's Office as well as general support across the many units within the department.

Strategies Employed

The MIA project used several strategies to achieve its goals. The primary goal of enhancing the analytical capacity of the MPD crime analysis unit was achieved through sequential formal training modules, informal internal training and coaching, as well as through restructuring of data systems. The second goal of targeting theft from motor vehicles was used as a platform for informing the development of the analytical processes and systems within the crime analysis unit. The tactics employed in each of the problem areas were based on crime analyses which utilized the crime triangle and other heuristics in problem-oriented policing and situational crime prevention as well as what was learned in the broader literature of tactics that had been utilized with some evidence of success elsewhere.

Goal 1: Crime analysis enhancement

Formal training

Formal training consisted of several SMEs being brought in to address specific needs for the Crime Analysis Detail (see Table 1). To establish a shared foundation, a nationally recognized expert in crime analysis (Ms. Julie Wartell) provided sequential in-house training sessions which addressed fundamentals in Crime Analysis (session 1) as well as Problem-Oriented Policing (session 2). These sessions proved beneficial as the crime analyst unit started producing administrative and tactical bulletins following that training. Originally, the plan was to develop an in-house training curriculum for the crime analysts. This was abandoned since it was recognized that sound crime analysis was currently available nationally and that the analyst unit would benefit more from receiving that training rather than cultivating it internally from within the department or from the research partner. It was also recognized that training needs would continually evolve within the unit as new demands and specific tactics were identified. Thus, establishing a

framework for administering on-going informal training sessions for the unit was adopted. Directly following the second training, the doctoral students began working at the police department and became embedded working alongside the crime analysts. While there was a learning curve regarding the students learning the internal systems of the police department, the students negotiated them with the help of the crime analysts. Reciprocally, the students assisted the crime analysts with the implementation of many of the ideas that were covered in the formal training sessions. Later in the project term the crime analysis unit also received three days of formal training in recent software updates and capacities of ArcGIS Pro.

Table 1. Overview of MIA Crime Analysis Training Activities Under SPI Project

Training Topic	Formal/ Informal	Instructor	Duration	Description
Crime Analysis Fundamentals	Formal	Julie Wartell	2 days	Covered a basic understanding of crime analysis, tools used in crime analysis, and how to produce a tactical bulletin
Crime Analysis for Problem Solving	Formal	Julie Wartell	2 days	Discussed Problem-Oriented Policing (POP) in depth, including going over <i>Crime Analysis for Problem Solvers in 60 Small Steps</i> (Clarke and Eck, 2005)
Excel	Informal	PhD Students	Ongoing	Explained advanced techniques regarding Pivot Charts and Tables, sorting, formatting
OneNote	Informal	PhD Students	Ongoing	Explored the creation of notebooks and data management to consolidate detective reports and flyers in an easily searchable and mobile platform
Word/Bulletins	Informal	PhD Students	Ongoing	Revamped Crime Analysis project to include a standard for formatting crime analysis products
Tactical Crime Bulletins	Informal	PhD Students	Ongoing	Taught analysis techniques to produce tactical crime bulletins, including SARA analysis
Data Visualization	Formal & Informal	David Knight, Data Consultant	Ongoing	Lectured regarding effective usage of data visualization within crime analysis products; partners with crime analysts in order to help to streamline analysis products

ArcGIS	Informal	PhD Students	Ongoing	Introduced analysts to mapping, geocoding, and hot spot maps
ArcGIS Pro	Formal	Betsy Leis, Esri instructor	3 days	Training on updated version of software, including the crime analysis toolbar.

Informal Training

Several other ongoing informal training modules were also carried out among the doctoral students, the data engineer consultant and the crime analysts (see Table 1). These activities involved topics such as advanced MS Excel functions like pivot charts and tables; the utility of OneNote as a searchable, mobile, and secure database for the analyst group and within the department; updating the structure of bulletins to streamline the process of product distribution; teaching mapping skills via Geographic Information Systems; supporting the formal training of data visualization as facilitated by the grant’s data consultant; and aiding in the continued support regarding ArcGIS Pro Crime Analysis Toolbar training. Beyond this, a general “osmosis” occurred where the doctoral students and data consultant worked collaboratively in support of the crime analysts. They provided guidance and suggests for using new analytical techniques and approaches to carry out daily tasks and served as an ongoing, readily available resource for the analysts. This helped the analysts further improve the development and output of their work products which went far beyond learning in a classroom setting since it also provided a framework for learning how to *implement* new skills.

Data systems restructuring

Lastly, another important aspect to improving the analytical capacity and efficiency of the crime analysis function within MPD involved the restructuring of the Departments data systems. A large part of the crime analysts’ duties stemmed from keeping a detailed, administrative log by

crime type. The data consultant developed software to streamline how data was obtained to fill out these daily logs and cut down the time spent on them in half as most of the data can be pulled on-demand by any of the analysts. Furthermore, with the data analyst, doctoral students, and analysts working together, root causes of data errors were identified within the Computer Aided Dispatch (CAD) system and Record Management System (RMS) which were updated to aid in COMPStat reporting as well as help patrol divisions by saving time in addition to assisting on the back end for the analysts. This restructuring automated previously time-consuming tasks of the analysts which freed up their time to devote to other analytical tasks.

Goal 2: Targeting theft from motor vehicles through POP and SCP

The secondary goal of targeting theft from motor vehicles continues to unfold, and because of this, remains a work in progress. The development and implementation of reduction techniques have been carried out on both a departmental level as well as within several specific NET areas which have experienced recurring problems of thefts from vehicles. At the departmental level many of the tactics were identified within the analysis phase of the SARA process. Some of the implementations comprised of the restructuring of internal operational units, while other responses entailed the allocation of technologies to problem areas.

Department Level Activities

Within MPD, structural changes led to the creation of a several new units devoted to addressing theft from motor vehicles. Early in 2019, a new detective unit was formed devoted specifically to these cases, particularly the ones identified as having high solvability. This Unit was previously housed under the Burglary Unit, however, the creation of the new unit, allows for a concentrated effort to work with NET area commanders, Neighborhood Resource Officers (NROs), Crime Prevention Specialists (CPSs), and Crime Scene Investigation (CSI) to procure

additional information regarding victims and offenders to identify and capture repeat offenders and solve more cases. Additionally, the unit responds to theft from motor vehicles when the property stolen involves a firearm, a monetary value of \$2,500 or over, or if the victim is a tourist. Further, a “Tactical Theft from Motor Vehicles Unit” was created to help capture known, prolific offenders in hotspots throughout the city. Finally, in response to rapid population growth of one problem NET area (Wynwood/Edgewater), including the growth of other crime and theft from motor vehicles, the operational area was divided into two NET areas to better assist with allocation of crime prevention and policing efforts.

Technological changes were also implemented and continue to be launched. With the advent of the Theft from Motor Vehicle Unit and to increase the solvability of crimes, a planned expansion of CCTV cameras within the top two NET areas with the highest rate of theft from motor vehicles is in place. Additionally, an increase of license plate readers (LPRs) within those areas will help to establish an intended “geofence” around the two targeted areas (Downtown and Wynwood), capturing possible offender license plates. The intent is that both actions will add to monitoring and ultimately to solving of crimes within these areas. Determining placement for cameras was a joint effort between the SPI crime analysis team, MPD commanders, and community partners.

Several other specific tactics were identified during the analysis phase and include the following:

- ***Improving lock-your-car-campaign messaging.*** A lock it or lose it campaign was introduced supplementary to the previously disseminated Park Smart signage across the City of Miami. Though the Park Smart signage encourages the safeguarding of vehicles from theft to an extent, the overall verbiage is problematic as Park Smart signifies a

multitude of meanings cross-jurisdictionally. For example, for those visiting from New York, they may associate Park Smart as an indicator of parking availability and lower parking rates (New York City Department of Transportation, n.d.). Thus, in an attempt to streamline the previously implemented and seemingly ineffective campaign, “Lock It or Lose It” signage and flyers were created as a more suitable approach to the tourist-driven City. Further, the design and verbiage of the new campaign was chosen in alignment with neighboring jurisdictions. To draw attention of the signage and flyers and make them more city-specific, Miami Vice colors were chosen as a template.

- ***Educating car owners about theft problems and prevention.*** Analysis of the modus operandi indicated a high percentage of incidents involving no forced entry and unlocked vehicles. As a result, in conjunction with the Lock it or Lose it campaign, crime prevention specialists engaged in a type of foot patrol in which educational pamphlets on the theft to motor vehicles were handed out to car owners.
- ***Installing and monitoring CCTV cameras.*** Based on prior police investigations, certain chronic theft from motor vehicle locations were identified as either having insufficient CCTV cameras that were unable to capture proper video footage, lacking resources to aid in monitoring functions, or as having CCTV cameras absent in general. As a result, a rather comprehensive listing of buildings and establishments with adequate and accessible CCTV cameras was conducted as a type of citywide needs-assessment.
- ***Improving lighting.*** With the identification of poor lighting in particular target areas and the associated risk factor in regard to theft from motor vehicles, improved lighting was included as a tailored response strategy. Additionally, internal crime prevention specialists

were provided with four new light meters to assist in their crime prevention through environmental design (CPTED) surveys.

- ***Increasing targeted patrols.*** Proper resource allocation, such as target patrol, was selected as a measure for areas in which temporal patterns (i.e., time of day and day of the week) regarding theft from motor vehicle incidents were apparent.
- ***Installing entrance barriers and electronic access.*** Entrances barriers were employed as a response strategy in order to limit offender navigability in selected highly accessible problem areas and corridors.

NET-Micro Area Interventions

Brickell – Rickenbacker Causeway

A sergeant transferred to the Brickell NET Area, who previously worked with the SPI analysis team, requested an analysis of the entire NET area due to an overall increase in theft from motor vehicles in the beginning of 2019. After receiving the strategic analytical product, the sergeant requested a mobile pole camera to a public park which was the area's most predominant hotspot. Within the forthcoming weeks, the area would receive an inundation of traffic due to Ultra Music Fest. The park (200 Rickenbacker Causeway) served as a popular walking and running area with scenic views of the city by the beach. The peak times and items stolen indicated that these crimes were being committed shortly after the victim left their car to go for a run or walk around the park which indicated that the offender was surveilling the area. Aside from the camera being deployed, patrol officers were encouraged to patrol the area during the early morning and late afternoon when runners and cyclists were known to visit the area.

Edgewater NET Area – Walgreens

Edgewater is adjacent to Wynwood, another heavy tourist area, and is the first area coming from Miami International Airport where tourists can stop for food or a local pharmacy. It offers quick access to several highways and main thoroughfares, and because of these things it provides a prime location for theft from motor vehicles. Due to low guardianship in its target rich environment, parking lots of stores and restaurants within this area have served as hotbeds for thefts from vehicles, in particular a Walgreens store, located on a main thoroughfare. Relying on analysis carried out by the SPI analysis team and seeing the apparent success in Brickell, the NET commander installed a mobile pole camera at the location. In addition, patrol officers were directed to frequent the location, and were told to strategically position themselves there on their downtime from calls for service during problem time periods as a preventive measure.

Wynwood NET Area – Parking Lot

The recently gentrified area of Wynwood had become a popular place for locals and tourists and because of this, experiences a constant flow of traffic. Resultingly, the area has become another target rich environment, with low guardianship around parking lots and areas as they are often a block or so from the main thoroughfare. Identified as one of the city's hotspots for thefts from vehicles and following the success of the intervention in Brickell, a mobile pole camera was also deployed to a problem parking lot located at NW 2nd Avenue and NW 28th Street based on analysis from the SPI team. Directed patrols were also implemented with strategic canvassing of problem locations identified in the analysis.

Data and Intelligence

Better utilization and integration of data was a central component of the MIA-SPI project. A major portion of activities within the project served to facilitate the improved transference of data into information to be utilized in operational decision-making. This aim was carried out

through several features of the project as the project functions were integrated into ongoing activities of the department. This included overhauling of the data harvesting process, and improved analysis of the data within the crime analysis unit, particularly as it related to problem-solving. These changes facilitated greater use of crime analysis derived information by NET commanders and task force units.

Data systems restructuring and training

First, efforts focused on increasing the efficiency of the data generation process. Historically a primary focus of the crime analysts' job stemmed from maintaining a log of specific crime times and relevant aspects of the incident (address, victims, weapons, etc.). The initial focus of the data engineer consultant concentrated on creating script that would pull the information needed from the records system, compile it within an Excel spreadsheet, and automate the process through a scheduler which would update every day. Within that process, by using certain coding techniques/scripts, information became streamlined by adjusting for spelling errors of car makes and models, adjusting the addresses so any intersections would display correct, roads, avenues, and places. With continual feedback of the SPI embedded doctoral students and the crime analysts, the refining of the process allowed for an expedient and accurate reporting of the crimes committed and is now being utilized daily in the completion of crime logs. Previously, the logs would take six to eight hours to fully complete, and now completion time has been cut in half.

Second, the streamlined data process coupled with the training program and more available time for analysts has allowed for greater engagement in problem analysis. With the amplified ability of gathering a plethora of data in a short amount of time, the analysts are now able to create tactical and strategic products that focus on the hotspots and the key elements of the crime triangle. This allows the analysts to provide more timely information to commanders and others within the

department to assist them in operational decision making. Third, these changes have facilitated greater use of analytical information within task force operations. Because of the enhanced products coming out of the Crime Analyst Unit, the command staff in coordination with task forces now commonly request crime analysts to provide strategic and tactical products and use them to develop operational strategies. Fourth, crime analysis of problems is now regularly requested by commanders in the field operation division. As the improved crime analyst products have dispersed throughout the department, more NET Commanders are requesting products from the crime analysts to take into consideration when implementing administration, strategic, and tactical operations.

New abilities and spillover effects

The use of data and intelligence information has also spilled over to other units within the police department not directly involved in the SPI project. This further exemplifies the “buy-in” that occurred as a result of the Crime Analysis Unit’s increased intelligence capacity. Three examples are provided. First, with the advent of new skills acquired by the crime analysts, their work products are used more regularly in COMPStat meetings by Criminal Investigations Division (CID). Crime analyst products are used to help to create an overview of Part 1 crimes in the city as well as identify repeat locations or hotspots within the previous 6 months. This allows COMPStat proceedings to evolve into a broader conversation, not just addressing trends within the past 30 days within a given NET area as had been done in the past. This broadening allows for larger patterns to surface and to be accordingly addressed and acted upon. Additionally, by having the analysts attend COMPStat meetings, they are able to run “in-the-moment” analysis based on conversations between Field Operations and Investigations Division to better understand emerging patterns. Recently, due to a rise in theft from motor vehicles during a historically low month, most

of July's COMPStat meeting discussed what each NET area commander was doing to help the prevention of these crimes and increase the apprehension of offenders.

Second, the improved use of data derived information has also dispersed into regular meetings which target violent crime. While monthly COMPStat meetings involve all NET areas, violent crime meetings involve those NET areas that are consistently faced with high numbers of homicides, felony assaults, and other instances where firearms are being used. In preparation for this meeting, a newly, streamlined report from the analysts shows where and when these incidents are occurring, using GIS mapping and Excel skills attributed to the informal training of the crime analysts by the doctoral students.

Third, the use of a qualitative search software introduced and used in the crime analysis unit has been adopted by part of the CID unit. In transferring knowledge and skills acquired through attending crime analyst conferences, the doctoral students initiated the use of OneNote as a way of compiling specific units' incident reports and outside data not usually found on the record management system. The program uses existing software, is easily navigated, allows for quick keyword searches, and provides a high-level of security since the information is stored on the department's internal Sharepoint. Each investigation unit's folder is organized by case number and each case number's page contains any information sent out to the entire unit, including incident reports, wanted flyers, crime analyst products, arrest forms, different pictures of suspects, and any additional information pertinent to the case. OneNote allows members of the unit to access the program on their mobile device to search the notebook, to make additions on the fly, and the ability to email the case folder. As long as the member of the unit has internet access, the page updates in real-time. The Robbery and Gang Units have adopted this program and took ownership and

maintenance of their folders. These units are serving as testbeds for CID and if successful, OneNote will roll out to all investigative units.

Analysis and Evaluation

The MIA-SPI project was assessed and evaluated by the research partner, which included a criminology faculty member and two embedded doctoral students. In addition to facilitating training and leading in the analysis and development of problem-solving activities related to theft from motor vehicles, the research partner carried out an evaluation of each of these two project goals. Mentioned previously, the theft from motor vehicle portion of the project is still in the implementation phase and as such the impact measures are limited. The impact of the analyst training and the crime analysis unit's development is more complete. To determine the impact of these two project goals the analyses focused on answering two primary questions: "Did the MIA-SPI project result in improved analyst knowledge and better, more useful analytical output?" and "Did the MIA-SPI project achieve any reductions in theft from motor vehicles in target areas?"

For the first research component, it was hypothesized that completion of the MIA training curriculum and other data processing improvements would result in analysts' being able to conduct sound and useful analytical reports for operational decision making. To test this hypothesis a quasi-experimental design was used which included a one sample pre-post design. Analytics included mean pre-post comparisons with a series of T-Tests to determine any measurement changes and Cohen's D to determine effect size. Data for this came from sequential tests of analysts and surveys of MPD commanders and administrators which were constructed by the research partner and administered by MPD command. The latter survey of administrators was implemented only once (cross-sectionally) after improvements had been made in order to assess perceptions of the analyst unit outputs. However, a series of questions which assessed perceptions prior to and after the

improvements were made were utilized to approximate a pre-post design and allow for similar analytical techniques. For the second component, only preliminary impacts were available since implementation was still ongoing. The evaluation of this was comprised of a simple time series assessment and emerging pre-post comparisons in micro-level target areas.

Goal 1: Crime Analysis Enhancement

Figure 4 presents a boxplot comparison of the average score change between before and after tests administered to the crime analysts surrounding the first formal training in *Fundamentals of Crime Analysis* carried out by the outside nationally recognized expert. Prior to the training the average score achieved by the analysts (N= 5) on the testing instrument was an 8.71. Following training, analysts were tested again using the same instrument with a post class mean of 13.33. These differences were statistically significant ($t = -2.789$; 8df; $p = .024$, equal variances assumed).

Figure 4. Pre-Post Assessment Outcomes of Fundamentals in Crime Analysis (N=5)

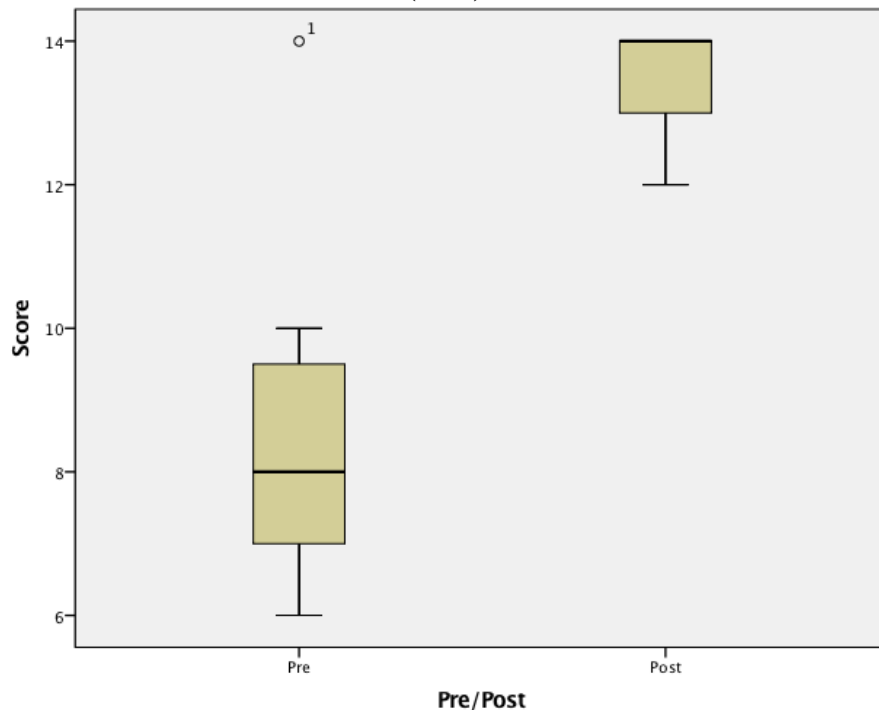


Figure 5. Pre-Post Assessment Outcomes of Crime Analysis for Problem-Solvers Training (N=6)

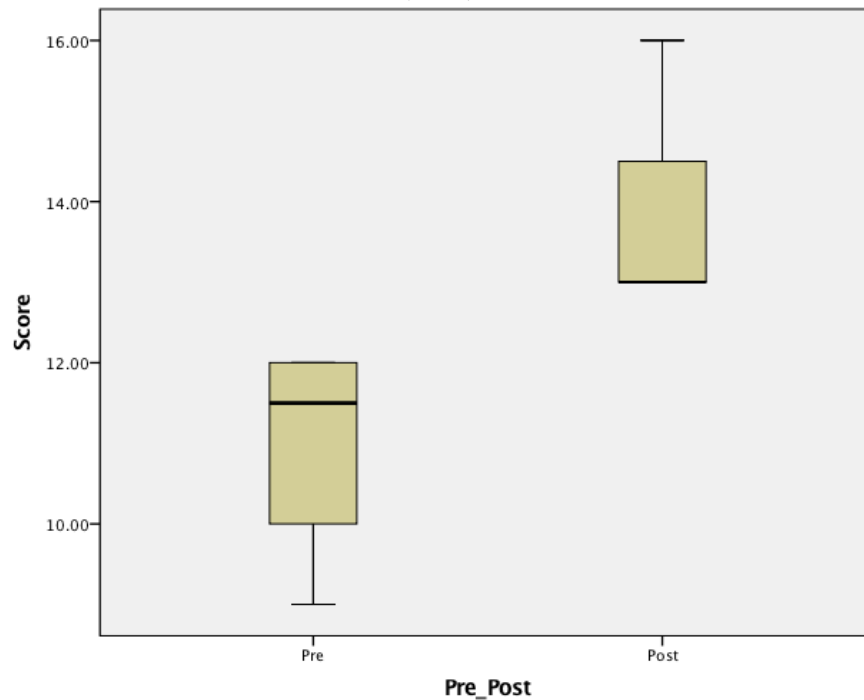


Figure 5 presents a boxplot comparison of the average score change between before and after tests administered to the crime analysts (N=6) surrounding the second formal training of *Crime Analysis for Problem Solving* also carried out by the outside expert. Here the difference was not as great, but still indicated improvement. Prior to the training the average score achieved by the analysts on the testing instrument was an 11. Following training, analysts were tested again using the same instrument with a post class mean of 13.75. These differences were nonetheless still statistically significant ($t = -2.668$; $6df$; $p = .037$, equal variances assumed).

To assess whether the new analytical products prepared by the analysts were being used more frequently in police operations and how they were perceived by their users, a fourteen question Crime Analysis Enhancement Project survey (for complete survey responses see Appendix B) was disseminated to police personnel whom were exposed to the products through

either formal or informal requests. The respondents were informed that their responses would aid in an evaluation of an existing project pertaining to the analytical enhancement of the unit and would remain anonymous. The survey was administered later in the project after enhancements and changes within the crime analysis unit had been carried out and was sent only to personnel who had been in a position to have utilized information produced by the crime analyst unit. The response rate was 100 percent with a sample $N = 36$.

Table 2 presents a descriptive overview of survey respondent characteristics. Most respondent users of the crime analysis work products were commanders ($n = 12$; 34%) followed by lieutenants and sergeants ($n = 7$; 20%, respectively). The next most frequent rank were detectives ($n = 3$; 9%) and Majors ($n = 2$; 6%). The remainder of respondents were spread among the other few administrative categories. The average number of years employed at MPD among respondents was 19, with the amount of time served in the department ranging from 11 to 27 years. Roughly 3 out of 4 respondents were male ($n = 27$; 77%) and most were Hispanic (49%) followed by White ($n = 8$; 23%), and Black/African American ($n = 6$; 17%) with the remainder Asian/Pacific Islander and other ($n = 2$; 6%, respectively).

Table 2. Overview of Internal MPD Administrator Survey Respondents

N = 36	Frequency	Percent ¹
Rank		
Asst. Chief	1	3%
Ex. Officer	1	3%
Major	2	6%
Captain	1	3%
Commander	12	34%
Lieutenant	7	20%
Sergeant	7	20%
Detective	3	9%
Unknown	1	3%
Years Employed*	19	--
Gender		
Male	27	77%
Female	8	23%
Ethnicity		
White	8	23%
Hispanic	17	49%
Black/African American	6	17%
Asian/Pacific Islander	2	6%
Other	2	6%

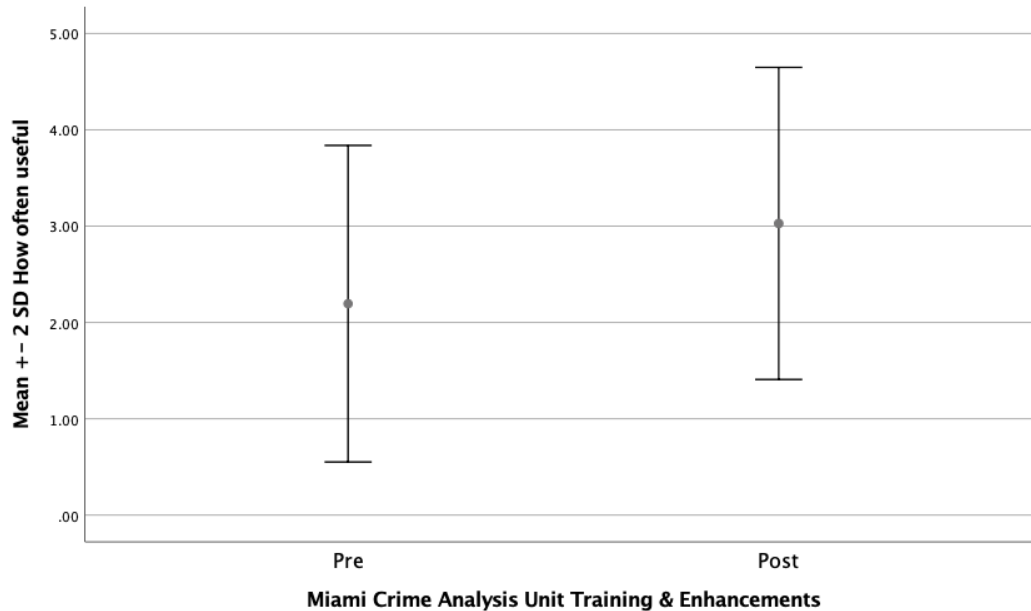
¹ May not equal 100 due to rounding.

*Mean reported.

The survey asked several questions designed to assess the perceptions of administrators regarding both historical and more recently improved work products disseminated by the crime analysis unit. Of the most relevant for assessing the impact of the MIA-SPI project are those which asked how often the information disseminated by the crime analysis unit were used to inform operational decision-making and for opinions of overall improvement and satisfaction with the work products. Figure 6 provides an error bar chart of the reported usefulness of the work products produced by the crime analysis unit for operation decision-making. Two questions were asked, one which assessed the frequency the information was used prior to the MIA-SPI project enhancements and one which assessed the frequency of use after the project enhancements (see

Appendix B, questions 2 and 3). Possible responses were coded as follows: 1 = never, 2 = only occasionally, 3 = one to two times per week, 4 = three or more times per week.

Figure 6. Usefulness of Crime Analysis Bulletins Reported by MPD Administrators



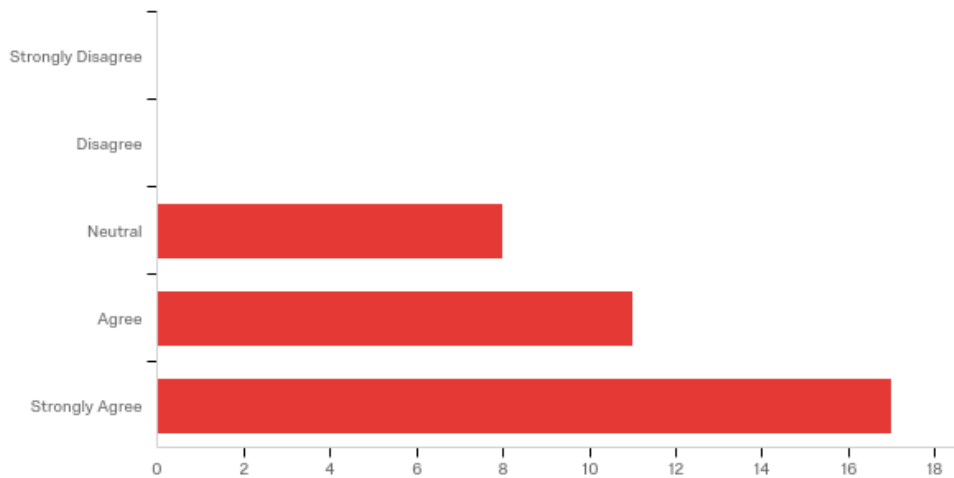
Exemplified in Figure 6, there was a significant increase in the reported use of crime analysis information following the MIA-SPI enhancements. The mean response for the pre period was 2.19 suggesting that crime analysis information was only used occasionally. Following the MIA improvements, the frequency of use mean increased to 3.03, suggesting that information produced by the crime analyst unit was now being used one to two times weekly on average. This difference was statistically significant. (Pre mean = 2.19; Post mean 3.03; $t = -8.204$; 35df; $p = .000$). Prior to the implementation of the project, the vast majority of respondents (78%) reported that they never used the crime analysis information or only used it occasionally. Following the improvements, 69 percent of respondents indicated that they used the information at least once or

twice per week, with 33 percent reporting that they used the information three or more times per week.

Consistent with this funding was the agreement among survey respondents regarding whether the work product produced by the crime analysis unit had been improved following the MIA-SPI project. Respondents were asked to record their agreement with the following statement, “Compared to previous years, overall the work product currently produced by the crime analysis unit is much improved.” Seventy eight percent of respondents reported that they agreed or strongly agreed that the analysts’ work product had improved.

Figure 7. Responses to Whether Crime Analysis Work Products Had Been Improved

(N=36)

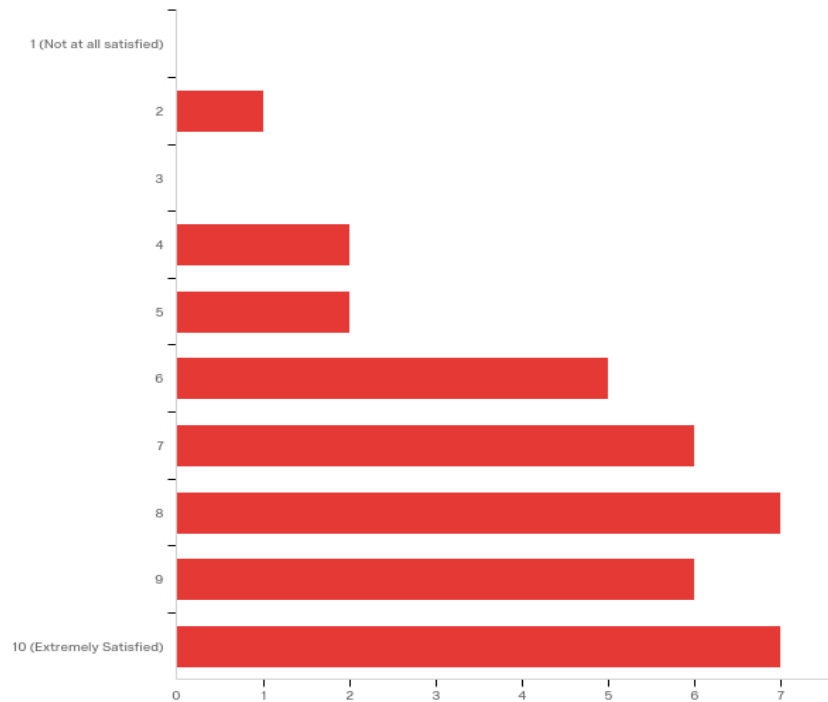


To determine overall satisfaction among users of the crime analysis work products which were deployed following the MIA-SPI project, respondents were also asked, “On the following scale indicate your overall satisfaction with the work products currently produced by the MPD crime analysis unit.” Illustrated in Figure 8, another consistent finding was shown with the average response score comprising a 7.56 with 86 percent of respondents recording a 6 or higher on the

10-point spectrum. Indeed, about 1 in 3 respondents (roughly 36 percent) recorded a score of 9 or 10 indicating they were extremely satisfied with the new work products produced by the crime analysis unit.

Figure 8. Extent of Overall Satisfaction with the Crime Analysis Work Products

(N=36)



As a final method to determine the impact of the MIA-SPI project on the improvement of the crime analysis capability within the MPD, effect sizes were computed for each of the measures which entailed a pre and post component. These calculations are exhibited in Table 3 and include measurements for the pre-and post-outcomes for the *Fundamentals of Crime Analysis* and *Analysis for Problem-Solvers* training courses, and the reported frequency of use of work products prior to and after the MIA project implementations from the administrator survey. Reported previously, each change was statistically significant, and all showed percentage increases ranging from 25 to 53 percent. Calculations of mean change effect sizes relying on Cohen's D and Hedges g, indicates

large impact effects of the MIA-SPI project in terms of improving the analytical capacity and usefulness of the crime analysis unit outputs with each change greater than one standard deviation of the pre-period averages.

Table 3. MIA Enhancements Pre-Post Changes and Effect Sizes

Component	Pre \bar{x}	Post \bar{x}	Change (%)	Effect Size
Fundamentals	8.71	13.33	+4.62 (53%)*	1.93 [†]
Problem-Solving	11.00	13.75	+2.75 (25%)*	1.89 [‡]
Usefulness ¹	2.19	3.03	+.84 (38%)***	1.38 [‡]

¹ Note, measurements reported were ordinal and should be interpreted and used in comparison with caution.

*Significant at $p < .05$; ***Significant at $p < .001$

[†] Hedges' g reported. [‡] Cohen's D reported.

Goal 2: Theft from Motor Vehicle Reduction

Since the implementation of measures intended to reduce the occurrence of theft from motor vehicles remains incomplete, findings related to their impact are much more tentative. Even so, there are some indications that changes have initially resulted in beneficial effects amidst a larger backdrop of a still increasing trend. The following presents some initial data which showcases overall trends for theft from motor vehicles within the city of Miami followed by some initial impacts at several micro-areas within the Department's operational NET zones. Figure 9 presents a time series trend assessment of thefts from vehicles. A substantial drop in thefts occurred in January 2018 until the middle of the year where they begin to steadily increase until January 2019. It is difficult to confidently determine what was responsible for this abrupt discontinuous reduction in the first part of 2018, but some reports indicate that policing tactics in the downtown area (a chronic hotspot for thefts) which increased the frequency of contact of officers with known offenders in the downtown area who were commonly homeless may have been attributable. This

in addition to the arrest of an organized airbag theft ring by a tactical response unit was also likely responsible. Data presented in Table 4 provides the percent change. While reductions in thefts from vehicles did occur in the early parts of 2018 and 2019, the overall trend continues to rise.

Figure 9.

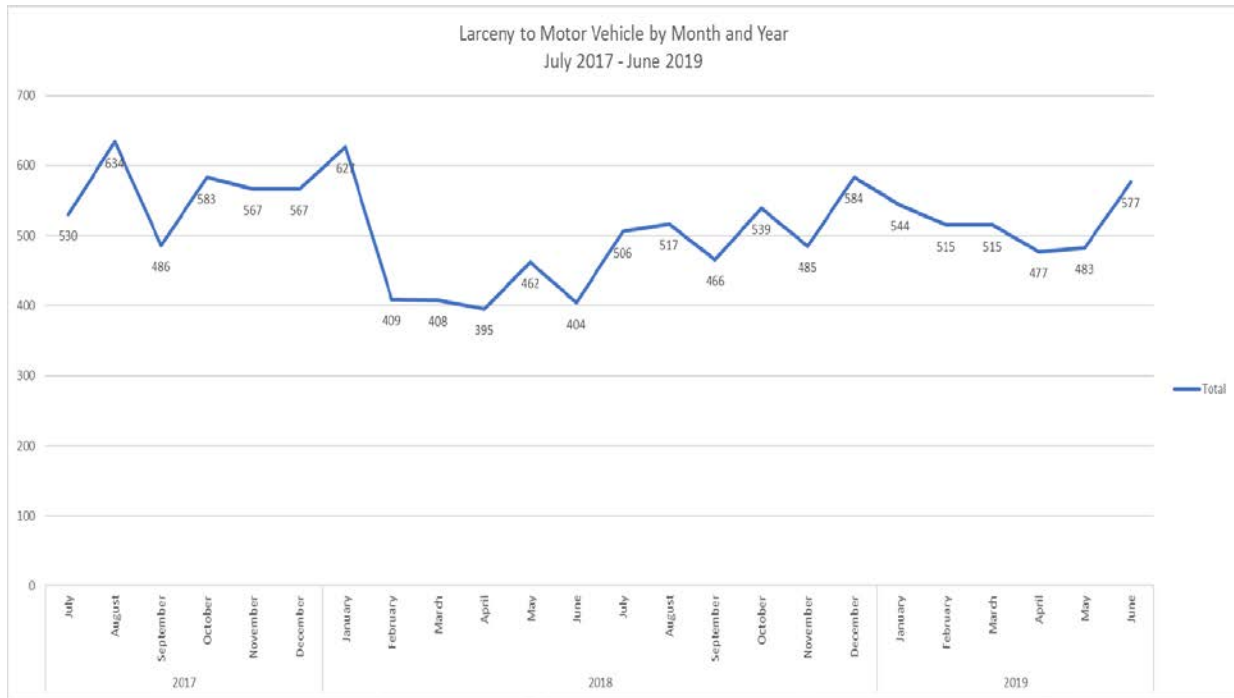


Table 4. Theft from Motor Vehicle by Month, Year and Percent Change

Month	2017	2018	% Change	2019	% Change	Total
January		627		544	-13.24	1171
February		409		515	25.92	924
March		408		515	26.23	923
April		395		477	20.76	872
May		462		483	4.55	945
June		404		577	42.82	981
July	530	506	-4.53			1036
August	634	517	-18.45			1151
September	486	466	-4.12			952
October	583	539	-7.55			1122
November	567	485	-14.46			1052
December	567	584	3.00			1151
Total	3367	5802		3111		12280

Targeted NET-Micro Areas

Identified previously, three micro-level target areas within operational NET zones which were experiencing problems with theft for motor vehicles implemented rapid responses consisting mainly of deployment of mobile CCTV cameras, increases in police presence and targeted/focused patrols. These responses were not intended as complete, well-rounded tactics encompassing all sides of the crime triangle which were identified in the problem-analysis phase by the analytical team, yet they were able to be deployed rapidly in response to pressing theft problems. Nonetheless, the initial apparent impacts of their deployment are worthy of preliminary reporting.

Table 5. Targeted NET-Micro Area Intervention Impacts

Target Area	Pre-intervention (Dates)	Intervention Deployed (Dates)	Post-Intervention (Dates)
	<u>2/25/19 to 3/24/19</u>	<u>3/25/19 to 4/22/19</u>	<u>4/23/19 to 5/24/19</u>
Brickell- Rickenbacker	9	1	8
	<u>1/01/19 to 7/4/19</u>	<u>7/5/19 to present</u>	<u>TBD</u>
Edgewater- Walgreens	23	1	TBD
	<u>1/01/19 to 7/8/19</u>	<u>7/8/19 to present</u>	<u>TBD</u>
Wynwood Lot Parking	21	2	TBD

In each of the three micro-target areas, abrupt and substantial reductions in thefts from vehicles were observed immediately following implementation (see Table 5). In the Brickell-Rickenbacker Causeway problem area during the time of the camera being deployed, only 1 incident occurred as opposed to 9 in the pre-intervention period. Once the camera was removed, thefts returned with 8 occurring in the post-intervention month. Similarly, at a Walgreens in the Edgewater NET thefts went from 21 in the first six months of the year, to only 2 in the following

two months after the responses were deployed (i.e. from a rate of about 3.5 per month to 1 per month). Lastly, at a parking lot in the Wynwood NET since the deployment of the camera within the parking lot at NW 2nd Avenue and NW 28th Street, only 2 theft to motor vehicles occurred and police officers were able to apprehend one of the perpetrators who was also a serial offender.

Clearly, more information would be necessary in order to confidently determine the impact of the interventions directed at reducing theft from motor vehicles in Miami. Such an analysis would need to accommodate for changes in victim or target populations, potential displacement and diffusion affects, and for other likely extraneous variables that could influence variation in thefts, such as seasonality among others. However, since the project responses have yet to be fully implemented a comprehensive analysis is undeserved. As future interventions take hold and are firmly implemented in target areas these initial findings may continue or they may be found to be insignificant. Whatever the case, at the current point in time a determination of the overall impact of the second goal of the MIA-SPI project remains incomplete.

Integration and Sustainability

As a result of the MIA-SPI project, several changes have been made within the Miami Police Department which were either directly or indirectly informed by the project. These changes fall within two general classes: those related to organizational units and those related to data structures and procedures. Three primary changes were made relating to organizational units. First, there was a division of one NET area into two. During the course of project analyses, it became evident that the areas which formerly fell within the Wynwood operational area were very distinct, potentially requiring separately focused resources. Recognizing this, MPD command separated the Edgewater district into its own operational NET area. This re-division was in acknowledgement of the differences in both crime elements and antidotes identified by the Crime Analysis Unit and

embedded criminologists. Second, two distinct operational units were formed devoted to the theft from motor vehicle problem. One was the creation of a specific detective squad which was solely tasked with investigating larceny from motor vehicle crimes. This unit prioritized cases they would handle based on the perceived solvability of cases. The third organizational change entailed the creation of an undercover street crimes unit devoted specifically to carrying out operations targeting theft from motor vehicle offenders within chronic hotspots. These operations were also informed by the improved problem-analysis carried out by the research team and the crime analysis unit.

Changes related to data structures and procedures entailed how data was retrieved from repositories and the thresholds previously used within the data entry phase. Adjustments in data structure were facilitated by the data engineer consultant and ultimately led to the changes in the daily operations of the Crime Analysis Unit. Tasks of compiling daily crime logs which historically consumed most of the analysts' time were automated. This freed up analysts' time allowing them to engage more fully in carrying out analyses which facilitates problem-led policing and other operational decision making. Another part of the change in data retrieval likewise dealt with the data visualization manager working with the Chief on operations to aid in more accurate metrics for crime reduction performance often utilized during COMPstat meetings. Additionally, with analysts now able to do more detailed analyses, it became apparent that many data fields which could be useful in decision-making were routinely missing from police incident reports. This resulted in changes to what thresholds would be deemed permissible for the acceptance of reports into the record management system. The threshold changes were a recommendation made by the doctoral students and Crime Analysis Unit in acknowledgement of the incomplete problem-analysis products that were being produced because of the previously missing information.

Several other changes were made which were more peripheral to the SPI project but related, nonetheless. These include changes to the crime analysis unit, the communications department, the records management system, and to the software systems maintained by the department. With the centralization and enhancements of the crime analysis and intelligence unit, came an improved status of the unit throughout the department. Widely perceived as having a secretarial crime counting function in previous years, the unit became viewed as an essential and centralized component now able to produce information valuable for informing policing operations as well as for use in COMPstat and Violent Crime meetings. Additionally, the Communications Department has taken on greater responsibility in ensuring patrol officers provide all necessary variables in the completion of their incident reports. This change was facilitated by a general recognition of the value of data which the analysis unit was now able to disperse for operational decisions. Historically data had been underutilized, since its value to the functioning of the department was not fully understood.

Changes were also made to the Records Management System (RMS). With the increased reliance throughout the department on data outputs, several deficiencies in the RMS became apparent. Recognizing this, MPD leadership and the IT Department decided to transition to a more modernized and efficient RMS system which would be more capable of supporting analysis and the production of usable information. Finally, the project assisted in solving several software redundancies which were identified by the data engineer consultant and the IT Department. These were removed which saved resources and streamlined data processing.

In addition to the changes that have become institutionalized over the course of the grant, there are several other components and advancements from the project that the MPD hopes to sustain in the following ways. Perhaps one of the most notable SPI outcomes that the police

department would like to maintain are the continual direct benefits of having the embedded doctoral student researchers working within the crime analysis unit. The facilitation of advanced statistical applications, research methodology and mapping software are all components that the Crime Analysis Unit has become heavily dependent on in terms of their integration within daily tasks and operations. Though informal in nature, the accessibility of the doctoral criminologists has proven to be a key ingredient in facilitating the implementation of the formal trainings received. Thus, the department has recognized the value of retaining the embeddedness of graduate students in the future either through additional grant funding, other forms of partnerships or internships.

Further, the benefits of integration of data into operational decision making has been proven and its continued use will also be sustained. Through administrative improvements facilitated in conjunction with the data engineer, the automation of data as a sustainable change within the department now allows the unit to produce products in a streamlined manner and thus devote more time to problem-focused analyses. Additionally, the improved analytical specificity has garnered favorable reception amongst command staff and investigative units and will undoubtedly be a sustained expectation within the Department. The enhanced analytical capacity of both the crime and intelligence analysts now serves as a foundational platform to develop and launch other data driven innovations within the Department. The dissemination of problem specific and actionable analysis coupled with the advancement in technological efficiencies are beginning to facilitate other modernizations such as intelligence-led and a real time crime information center which exemplifies how the MPD intends to transition and sustain the strengthened skills of the analyst unit into future operations.

Summary and Conclusions

The MIA-SPI project sought, to improve the crime and intelligence analysis function within the Miami Police Department. This goal was achieved. This was accomplished through a series of formal and informal training sessions carried out during the project period, the hiring of a data engineer consultant to revamp and overhaul internal data systems, and through engagement with an academic research team which facilitated the embeddedness of criminology doctoral students working internally within the crime analysis unit. The MIA-SPI project also launched a problem-solving initiative which targeted theft from motor vehicles as a means to both reduce crime and to showcase improved techniques of crime analysis.

Measures collected in the evaluation of the project indicate that the initiative substantially improved the analytical knowledge and skills of the analysts and significantly increased the extent to which crime analysis work products are used by MPD administrators and detectives. Pre and post knowledge tests of analysts surrounding formal training sessions showed a 25 to 53 percent improvement in testing scores. Further, an approximated before and after assessment of administrators found that analytical work products went from being used never or only occasionally, to now being used about 1 to 2 times per week on average. This alone signifies a remarkable achievement in the transformation of the crime analysis unit which is furthering the integral use of data derived information in the performance of policing operations within the MPD. As the secondary goal of the project devoted to reducing theft from motor vehicles remains in the implementation phase, impact results of that aspect of the project remain inconclusive.

Several lessons were learned in the completion of the project which can be of use for others. First, relying solely on traditional formal training methods for police personnel will likely produce limited impacts. It became very apparent in this project that having embedded doctoral students

allowed for ongoing assistance in the implementation of the new ideas to which analysts were exposed. Without their presence it is quite likely that very few of the new techniques would have been actually implemented in their day to day tasks. In terms of improving the analytical outputs, the informal coaching and mentoring turned out to be crucial for altering how things were done and what was ultimately produced by the analysts. Second, police departments, like all organizations, are comprised of interconnected units which communicate and perform in relation to one another. As the crime analysis unit became more established and able to offer more usable information, a remarkable transformation was observed across other interconnected units within the department as they began to seek out and better utilize the information produced by the crime analysis unit. As improvements were made within the crime analysis unit, a certain diffusion of benefit occurred which improved the practices of other units within the department.

Third, establishing buy-in for your project through demonstration of its benefits is crucial not only for producing an impact but also for project continuation in the face of administrative attrition and personnel transitions within your project team. Throughout the course of this project several MPD administrative “handlers” came and went. The project was able to continue and sustain its course despite these setbacks partly because it was strongly endorsed by the Chief’s office, but also because the benefits of improved analytical outputs were observed anecdotally by various personnel throughout the department. Fourth, when engaging in collaborations particularly those which are embedded it is important to recognize and be sensitive to the difference is between research organizations and police departments. Mutual understanding and respect of each, by each entity, can help foster strong partnerships with mutually beneficial results.

Lastly, it is important to note that this project benefited from Training and Technical Assistance funding provided by BJA above and beyond what was received through the SPI grant

project. This included to sequential crime analyst training sessions by a nationally recognized expert early on in the project as well as an external assessment of the crime analysis unit's data systems and procedures by a separate consulting expert at a later phase.

References

- Boba, R. (2003). *Problem analysis in policing*. Washington, DC: Police Foundation.
- Clarke, R. V. (2002). *Thefts of and from cars in parking facilities* Washington, DC: Office of Community Oriented Policing Services.
- Clarke, R. V., & Goldstein, H. (2003). Thefts from cars in center-city parking facilities: A case study in implementing problem-oriented policing. *Crime Prevention Studies*, 15, 257-298.
- Dolly, C. & Shawver, B. (2018). The organizational and practical considerations of starting a crime analysis unit: A case study of a midwestern police department. *Policing: A Journal of Policy & Practice*, 12(3), 255–264.
- Eck, J. E. & Spelman, W. (1987). *Problem-Solving. Problem-Oriented Policing in Newport News*. Washington, DC: Police Executive Research Forum, and the U.S. National Institute of Justice.
- Goldstein, H. (1990). *Problem-oriented policing*. New York: McGraw-Hill.
- Gottlieb, S., & Arenberg, S. I. (1991). *Crime Analysis: From Concept to Reality*. Office of Criminal Justice Planning.
- International Association of Crime Analysts. (2014). *Definition and types of crime analysis* [White Paper 2014-02]. Overland Park KS: Author.
- Keister, T. (2007). *Thefts of and from cars on residential streets and driveways* Washington, DC: Office of Community Oriented Policing Services.
- New York City park smart: New rates equal more parking [Brochure] (n.d.). New York City: Department of Transportation. Retrieved from:
<http://www.nyc.gov/html/dot/downloads/pdf/parksmart80thflyer.pdf>
- Santos, R. B. (2014). The effectiveness of crime analysis for crime reduction: Cure or diagnosis? *Journal of Contemporary Criminal Justice* 30(2): 147–168.
- Santos, R. B. (2016). *Crime analysis with crime mapping*. Sage Publications.
- Santos, R. G. (2018). Police organizational change after implementing crime analysis and evidence-based strategies through stratified policing *Policing: A Journal of Policy & Practice*, 12(3), 288–302.

Appendix A. Example Enhanced Crime Analysis Bulletin



City of Miami Police Department
 Crime Analysis Detail
 Office: 305-603-6575



CITY OF MIAMI POLICE DEPARTMENT
 CRIME ANALYSIS UNIT
 305-603-6575
 FOR LAW ENFORCEMENT PURPOSES ONLY

Product: 25
 Date Released: 09/10/2018

Product Number: 01

Issue Date: 03/14/2018

Larcenies and Burglaries from January to Mid-March

The following information details Burglaries and Larcenies, limited to 27V signals, in the Coral Way NET area for the period of January 1, 2018 to March 13, 2018 using locational and temporal analysis. Information from the same period in 2017 has also been provided for comparison. This information was gathered using PremierOne, CrimeView, Crystal, and our Crime Analysis logs. It should be noted upon further review of cases 180225-0015468 and 180305-0017530, showed no report information written in PremierOne. In addition, case 180204-0009595, was assigned the wrong signal and case 180118-0005029 was missing from the Crime View data.

BURGLARIES AND LARCENIES IN THE CORAL WAY NET AREA

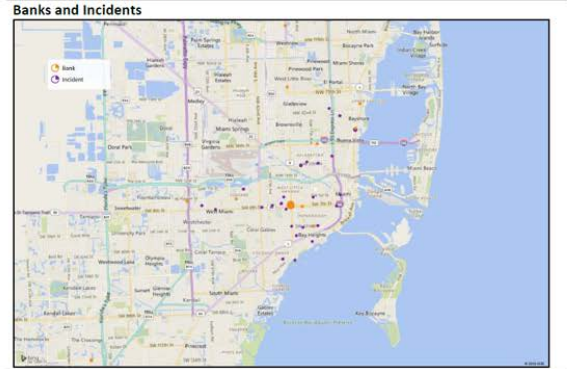


Year	Total
2018	Burglaries - 51, Larcenies (27V) - 108

TEMPORAL ANALYSIS FOR LARCENIES



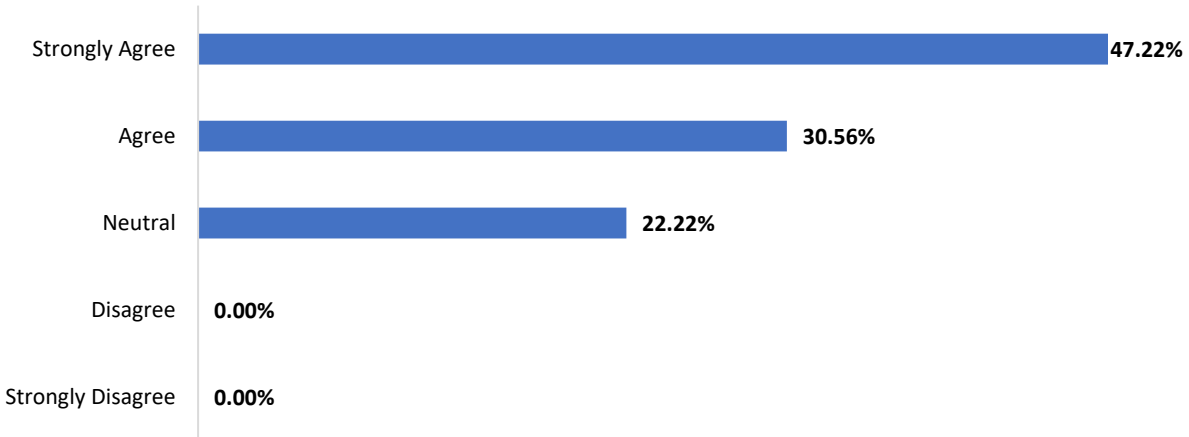
Potentially Related 27Vs where Offender(s) follow Victim(s) from Banks	
Number of Incidents	31
Date Range	06/26/2017-09/06/2018
Day of the week	Peak days: Tuesday (25%), Wednesday (22%), and Friday (19%)
Time of Day	Shift A (54%), Overlap of A/B (29%); 10:00-13:00 and 14:00-15:00
MO	Offender(s) case out banks, observe where victim(s) stash money from bank, follow victim(s) to another location, wait for the victim(s) to leave their car, and break-in to the target vehicle and take the money.
Method of Entry	Varies: Broken Window 77%, No signs of forced entry 13%, Tampered Door Lock 6%, Unknown 3%
Top 4 Net Areas of Incident Locations	Flagami (25%), Coral Way (16%), Little Havana (16%), Alapattah (13%)
Net Areas of Bank Locations	Unknown (38%), Flagami (25%), 31% Scattered throughout the other NET Areas, Out of Jurisdiction (16%)
Repeat Locations of Banks	Wells Fargo, 622 SW 27th Ave, Miami, FL 33135 - 7 Reported instances where the victim has left this bank branch
Vehicle Information	Suspects use a wide range of vehicles, sometimes using multiple vehicles to watch and then follow victims



Appendix B. Survey Results Crime Enhancement Project

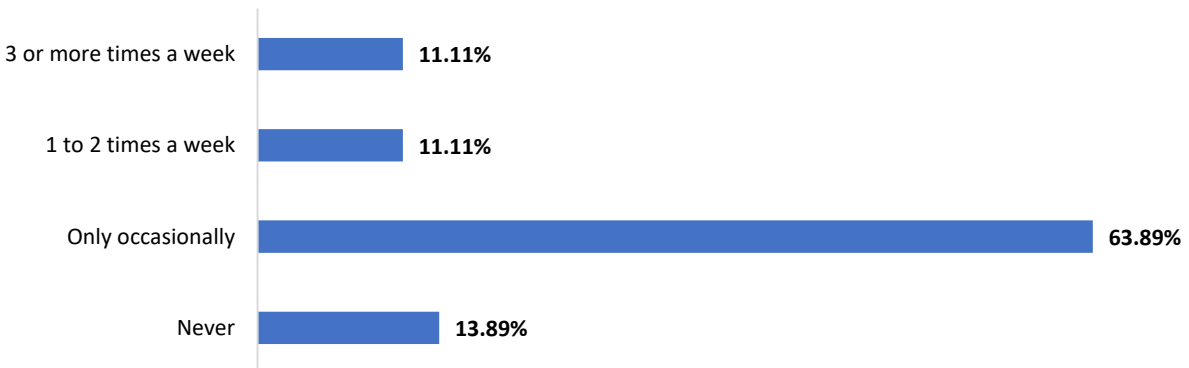
Q1. Compared to previous years, overall the work product currently produced by the crime analysis unit is much improved.

(N=36)

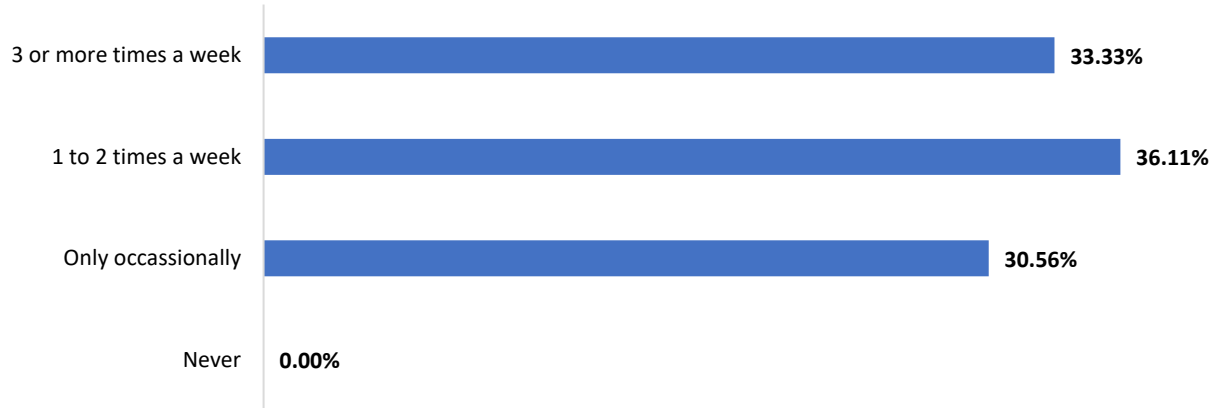


Q2. In the past before the recent changes in the crime analysis bulletins (i.e. prior to one year ago), about how often was the information useful for you in your job?

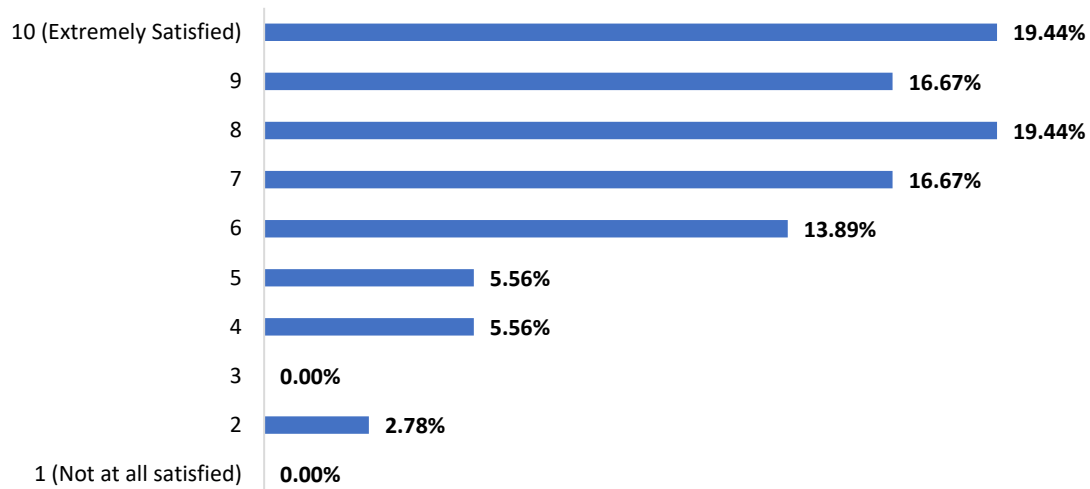
(N=36)



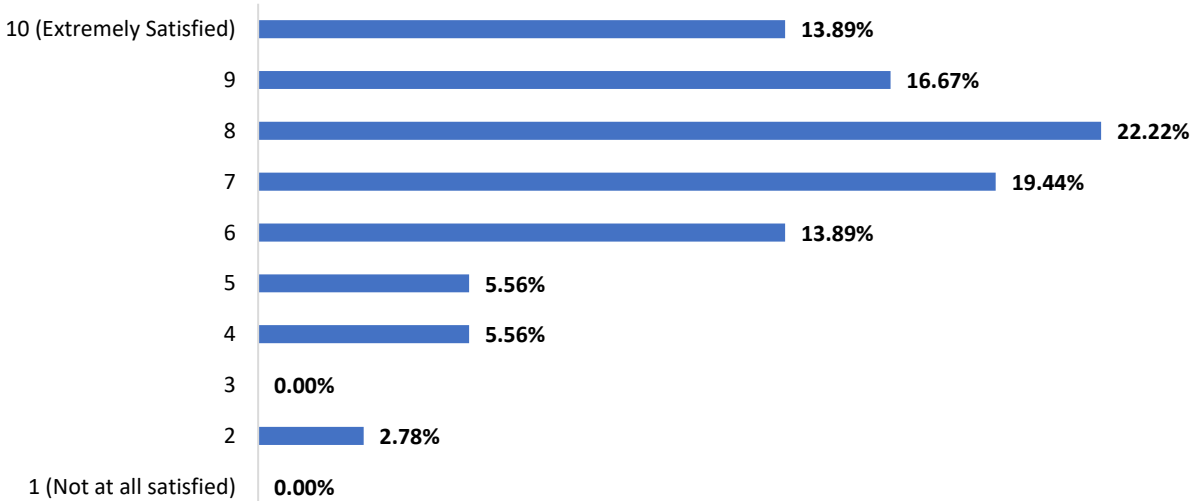
**Q3. In recent months after the changes in the crime analysis information which are now being provided in bulletins, about how often is that information useful for you in your job?
(N=36)**



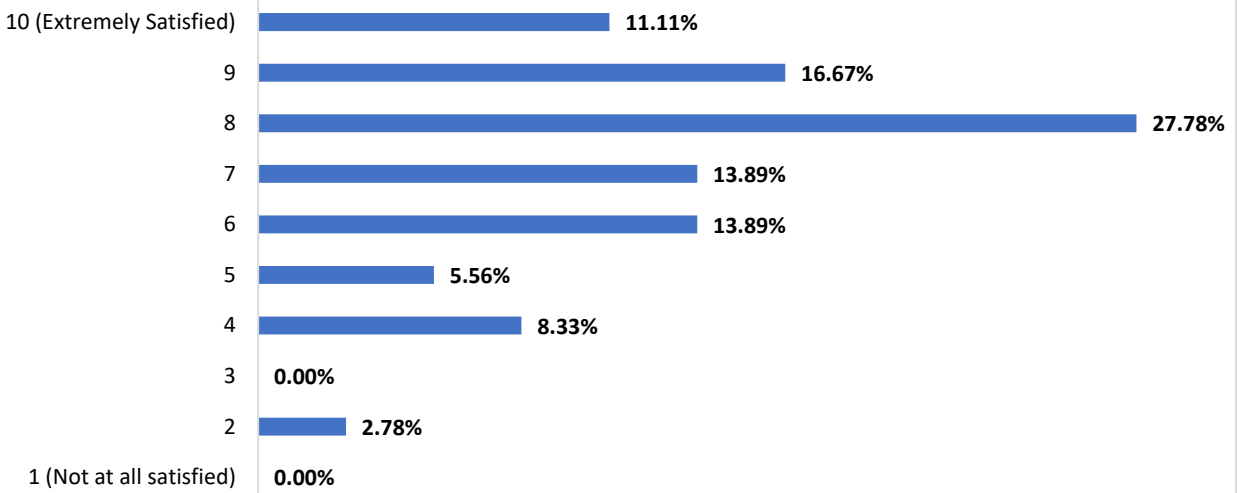
**Q4. On the following scale indicate your overall satisfaction with the work products currently produced by the MPD crime analysis unit.
(N=36)**



**Q5. In terms of the information content within the most recent crime analysis bulletins, please rank them on the following scale.
(N=36)**

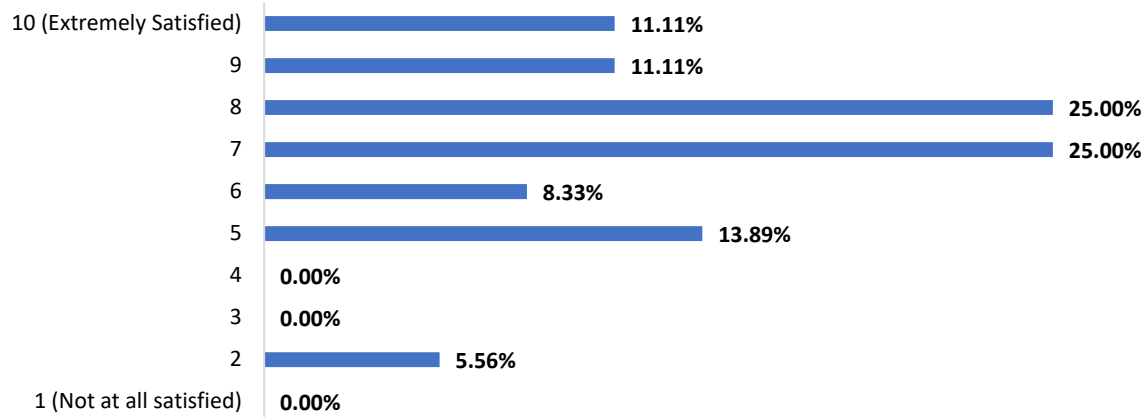


**Q6. In terms of the level of detail within the most recent crime analysis bulletins, please rank them on the following scale.
(N=36)**



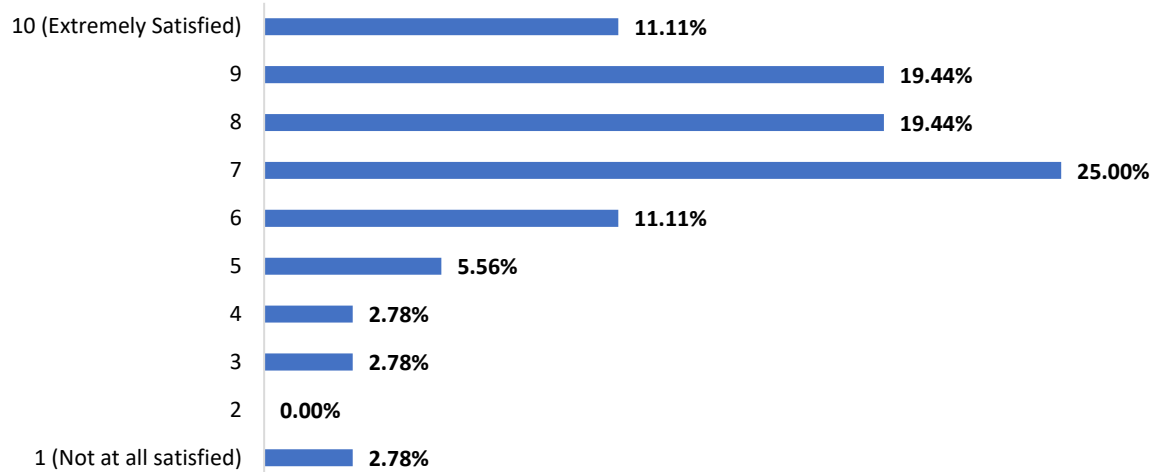
Q7. In terms of the scope of analysis (i.e. time period, range of information) within the most recent crime analysis bulletins, please rank them on the following scale.

(N=36)

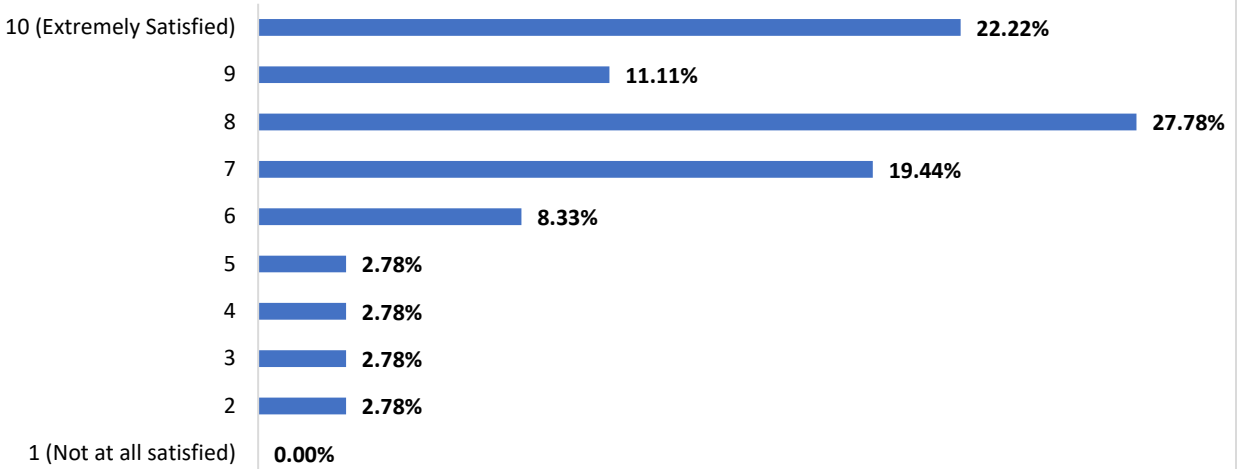


Q8. In terms of the clarity of information within the most recent crime analysis bulletins, please rank them on the following scale.

(N=36)



**Q9. In terms of the presentation format of information within the most recent crime analysis bulletins, please rank them on the following scale.
(N=36)**

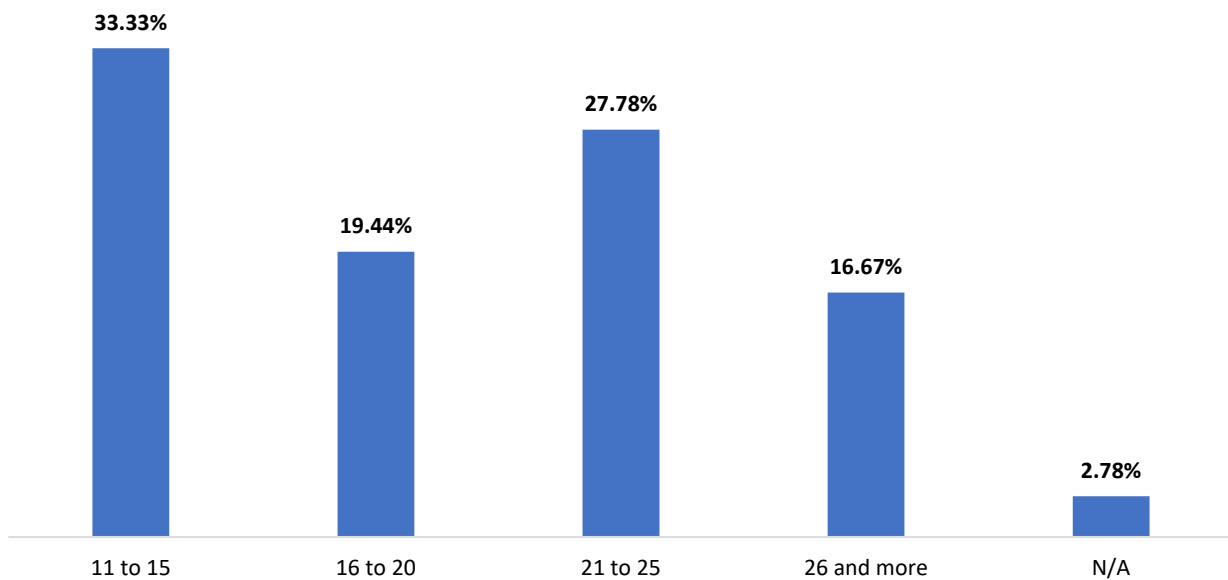


Q10 - In what ways can the crime analysis bulletins produced by the crime analysis unit be further improved? (open ended)

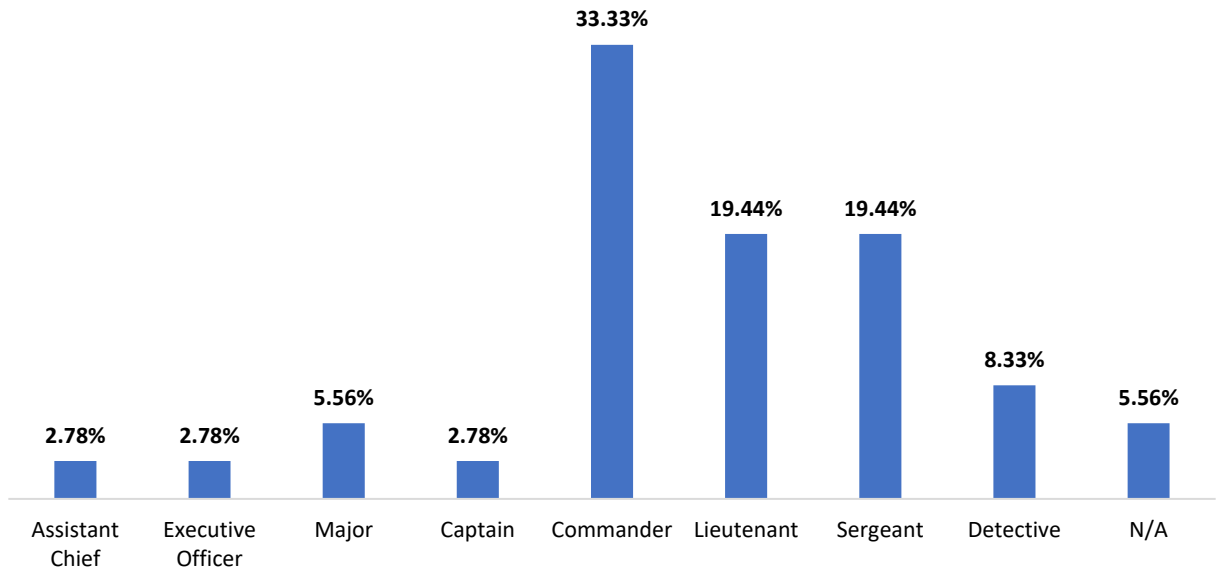
Common Themes Identified:

- Patterns/Trends/Correlations
- Geographic Focus
- Offender Focus
- Timely Production

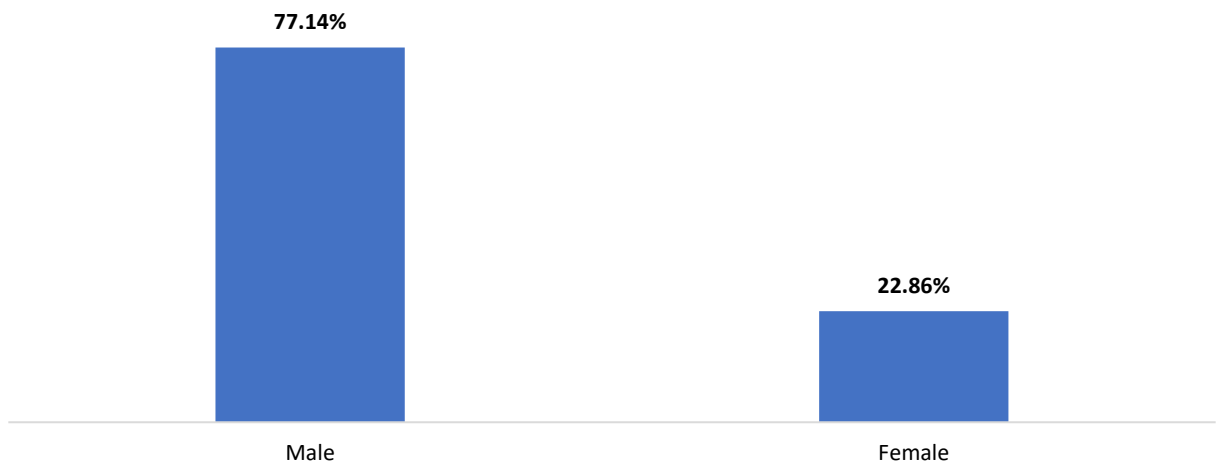
**Q11. How many years have you been employed with MPD?
(N=36)**



**Q12. What is your title/rank?
(N=36)**



**Q13. What is your gender?
(N=36)**



Q14. What is your ethnicity?
(N=36)

