Smart Policing and the Michigan State Police: Final Report[1]

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Smart Policing and the Michigan State Police - Executive Summary

Description of the Project: The Michigan State Police (MSP) has made a commitment to the adoption of data-driven processes, evidence-based practice (EBP), and the use of strategic planning and metrics, in order to increase the effectiveness and efficiency of service delivery to the citizens of the state. To facilitate the adoption of these principles and practices, MSP applied for and was awarded a Smart Policing Initiative (SPI) grant from the Bureau of Justice Assistance. MSP used this grant to engage in a systematic planning process, to support implementation of various practices consistent with SPI principles, and to assess progress of the organizational change process.

Summary of Outcomes: This report documents extensive activities that have been undertaken in planning and implementation of data-driven processes. The key findings are that initial planning led to a new MSP Strategic Plan that clearly endorsed the principles of data-driven processes, EBP, and metrics; that significant training has been conducted to facilitate the adoption of these principles and practices; that new technology systems have been developed and are being utilized to support this organizational change; and that evidence of data-driven processes exists in numerous divisions and units throughout MSP.

Lessons Learned: Consistent with prior research on policing and public bureaucracies generally, broad organizational change is difficult and requires the type of systematic and multiple level change process embarked upon by MSP. Leadership's consistent and firm commitment to the goals, principles, and processes at the core of the organizational change, as is apparent in this effort by MSP, is critical to sustaining the change process. Having said this, leadership commitment is essential but not sufficient. Training at all levels of the organization is essential to develop commitment to these new goals, principles, and processes and to provide the knowledge and skills to carry out these new processes throughout the organization. Similarly, providing the necessary resources, in this case a new sophisticated information system as well as an intelligence center, is critical for organizational change. The findings of this research provide clear evidence of these critical change components: leadership commitment; training; and technological resource development.

The organizational change process is ongoing. The clearest evidence of change is at the executive and middle-management levels and throughout various divisions and units across the organization. There is also evidence of change at the line level of trooper. However, the line-level training occurred at the end of this research project without adequate time to accurately measure the actual impact on day-to-day line-level operations.

Implications: Significant organizational change takes time. MSP's processes that included extensive planning- a new strategic plan; widespread training; and support resources (technology and intelligence center); provide a model for necessary ingredients of major organizational change. This type of organizational change process is ongoing and will need continual commitment and training. Sustaining the research partnership to provide ongoing assessment of change and feedback could support MSP's internal metrics and provide ongoing measures of the transformation to data-driven processes, EBP, and the use of metrics of effectiveness and efficiency in service delivery.

Smart Policing and the Michigan State Police

Smart Policing (SP) refers to a set of principles that are intended to transform policing through the use of data-driven processes and decision-making and the adoption of Evidence-Based Practices. Adopted in an era when many policing agencies faced significant resource constraints, SP seeks to increase effectiveness and efficiencies through data-driven approaches. The key principles include:

- "Performance measurement and research partnerships,
- Outreach and collaboration,
- Managing organizational change,
- Strategic targeting, and
- Making better use of intelligence and other data and information systems" (Smart Policing Initiative, 2015)

SP builds upon principles of organizational and public administration generally, but also concepts developed under the problem oriented policing (POP) model (Goldstein, 1990). The POP model was based on research demonstrating the concentration of crime among people, groups, places and contexts. POP advocated an analytical approach to crime issues by analyzing patterns of specific crime problems, developing data-driven strategies, and assessing the impact of these strategies and interventions. SP expands the model from data-driven analysis of crime problems to data-driven analysis of all organizational processes and a commitment to data-driven decision-making.

In 2011, the MSP decided to adopt the principles of SP throughout the entire organization. Similar to the forces that have led police leaders to the concept of SP, MSP faced external pressures that suggested new approaches were needed to meet its public safety mission. Specifically, even before the national recession of 2007, the state of Michigan had experienced significant fiscal challenges due to shifts in the global automobile industry, population loss, tax revenue shortfalls, and related factors. These pressures had resulted in significant losses to MSP's budget and workforce. Under the direction of Colonel Kristie Kibbey Etue, the leadership team within MSP decided that the organization must use data to inform decisions and leverage technology in order to increase the effectiveness and efficiency of the organization. Further, rather than view this as an undertaking to change specific processes, tasks, or divisions, the leadership team committed to adoption of data-driven processes and decision-making throughout the entire organization. To support this ambitious goal, MSP applied for federal funding to support a planning and assessment process under the Bureau of Justice Assistance's (BJA) SPI program.

Description of the Project

The SPI grant awarded by the BJA to the MSP was intended to support an organizational development strategy with the goal of integrating SP principles into the mission, structure and processes of the MSP. Specifically, MSP sought to use the grant to support a planned change process to integrate data-driven processes throughout the organization. The adoption of data-driven processes and decision-making was undertaken with the objectives of fostering evidence-

based practices, innovation, and greater efficiency and effectiveness in achieving MSP's broad public safety mission.

Methods

During the course of the project, two Research Partner (RP) teams from Michigan State University's School of Criminal Justice collaborated with MSP to engage in research activities at different stages of the SPI initiative. The initial RP team (RP-I) focused on organizational planning and problem analysis as a way of providing an analytical foundation for the organizational change process and the adoption of data-driven processes and SP principles. The second RP team (RP-II) focused on assessment of organizational change.

Both RP teams used multiple research methods. RP-I reviewed MSP organizational documents, conducted interviews and focus groups, and conducted an organizational survey. The present report includes reference to findings from these various RP-I research activities. RP-II similarly reviewed organizational documents and conducted interviews. Additionally, RP-II used observational methods to assist with the assessment of the integration of SP principles throughout the organization. Thus, meetings with MSP staff involving multiple divisions, functions and personnel (e.g., central administration leadership teams; training academy; forensic science laboratories; field posts) provided opportunities to observe the use of data-driven processes throughout the organization. The observational strategy benefited by the placement of research team personnel within the Grants and Community Services Division of MSP to work on various analytical and research projects. Similarly, members of the research team were involved in violence prevention and control projects in Detroit and Flint that overlapped with the state's Secure Cities Partnership and again provided the opportunity to observe MSP on a routine basis.

The document reviews, interviews, and observations were also used to conduct a series of case studies. The case studies were intended to examine both ongoing tasks, such as the operation of the training academy and forensic science laboratories, as well as specific problem solving efforts whereby MSP sought to address a specific crime issue. The intent of the case studies was to examine whether data-driven processes were apparent in the day-to-day operations of MSP and across various divisions and units of MSP.

The report begins by reviewing the key activities and accomplishments following a timeline from 2011 through the end of 2015. The next section covers key activities during the planning phase including an organizational survey and the new MSP Strategic Plan. The following sections focus on the use of data and the "MSP Dashboard" information system as well as the training efforts to support the adoption of SP. This is followed by three case studies that provide an opportunity to assess whether SP principles were being observed in practice. Finally, the report concludes with lessons learned and limitations of the present research.

Findings

Activities and Accomplishments

As displayed in a series of timeline figures, MSP embarked on a large number of activities and demonstrated a number of concrete accomplishments during the years of the SPI. Colonel Kriste Kibbey Etue was appointed Director of MSP in January 2011. The MSP leadership team was familiar with concepts such as New York Police Department's COMPuter STATistics (COMPSTAT) and metric driven business processes that, for example, had been employed in the management of MSP's forensic science laboratories. Similarly, they were drawn to the notion of EBP. The leadership team recognized that confronting the challenges of public safety in an era of fiscal pressures would require greater reliance on data-driven processes and technology. The leadership team also made a commitment that these changes would occur throughout the entire organization as opposed to a specific division or unit.

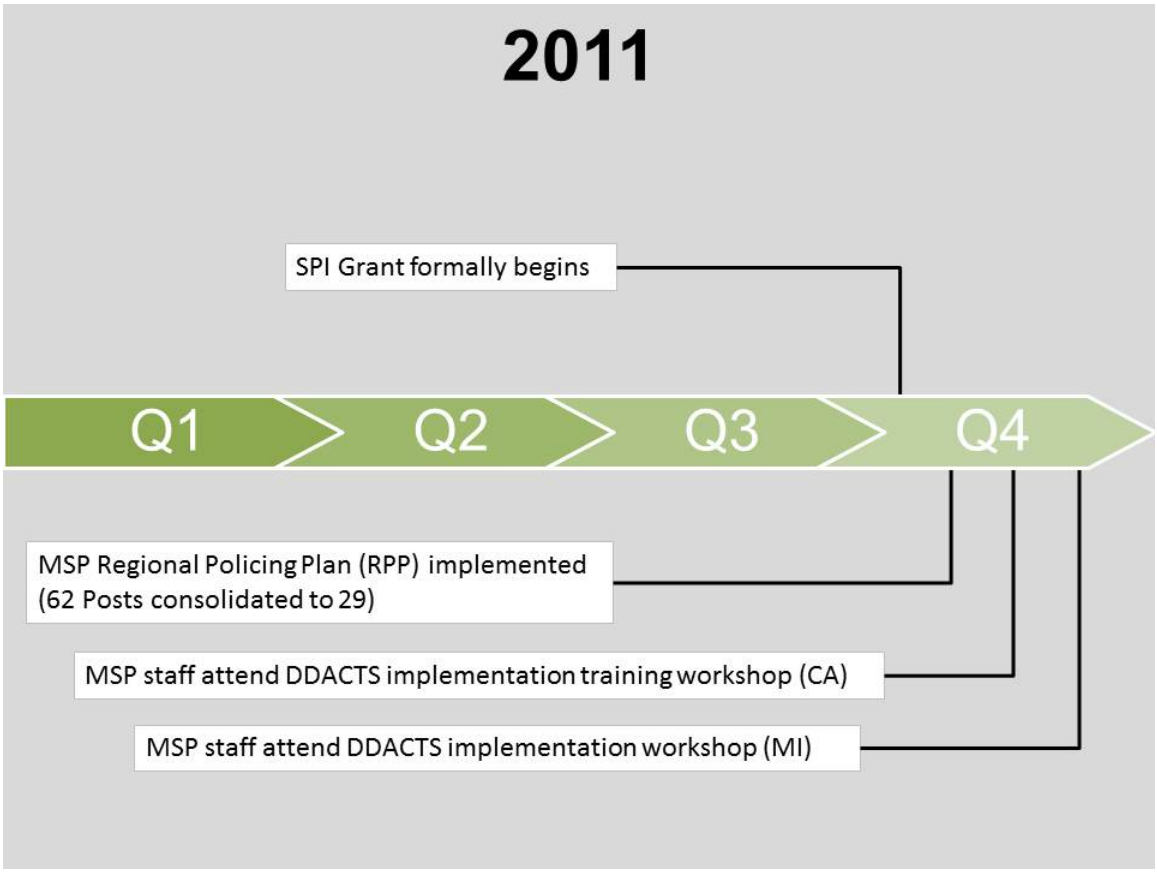
During 2011, MSP had been working on a Regional Community Policing Plan (RPP) that would include closure of posts in various locations around the state. As noted above, the fiscal pressures that led to the RPP were an impetus for the adoption of SP principles as MSP leadership remained committed to its mission of public safety throughout the state but with recognition of the need to harness technology for greater effectiveness and efficiency. The RPP had implications at both the post level and the level of individual troopers. At the post-level, there was recognition of the need to provide quality and timely data so that post commanders could better understand the crime and public safety needs in the particular region. At the individual level, there was recognition of the need for more flexible deployment of troopers given the wide geographic variation across the state. Thus, MSP coupled the closing of posts with a shift toward "mobile offices" whereby some troopers would be deployed from their police vehicles, using in-car technology in place of the long-standing tradition of reporting to a physical post for roll-call and deployment. Additionally, the role of sergeants changed from a largely administrative role to a more active role in the deployment of troopers to meet regional needs. Developing the technological and associated human capacity to effectively deploy in this model was a cornerstone of the SPI initiative.

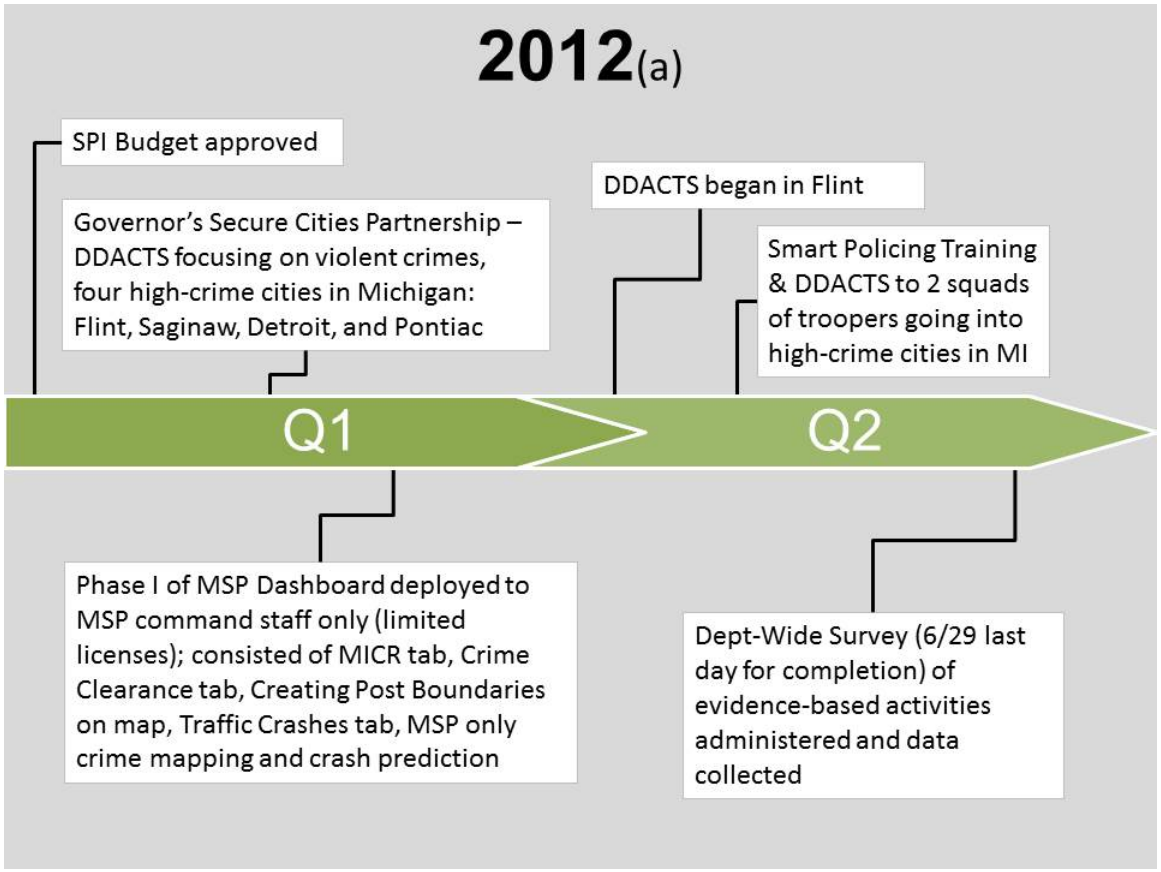
During this same period, MSP leadership became familiar with the "Data Driven Approaches to Crime and Traffic Safety" model developed by the National Highway Traffic Safety Administration (NHTSA) in collaboration with the BJA and the National Institute of Justice (NIJ) (NHTSA, 2009). Known as DDACTS, this approach embodies the SP philosophy as it uses the analysis of crime and traffic crash patterns to more effectively deploy resources with the goal of reducing crime and enhancing traffic safety. During the final quarter of 2011, MSP had staff attend two different workshops on DDACTS in anticipation of building capacity for data-driven approaches in the Field Services Bureau.

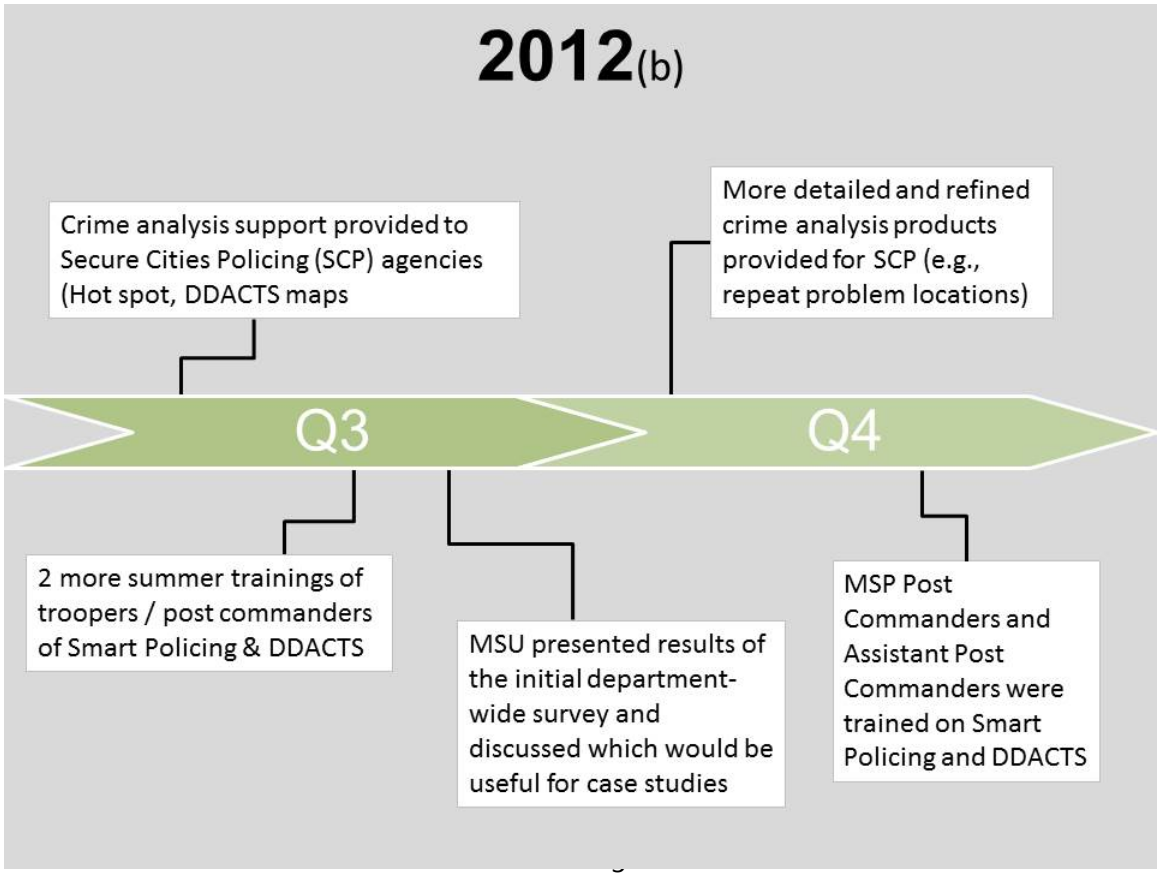
Early 2012 witnessed two important milestones. The SPI budget was approved and the Secure Cities Partnership (SCP) was launched. The SCP involved the deployment of MSP resources to assist local communities and their local law enforcement agencies better address the violent crime problem. This represented a philosophical and programmatic shift from a primarily highway patrol function to an expanded mission including urban, proactive enforcement focused

on violent crime. The initiative initially focused on four Michigan cities experiencing both fiscal challenges and high rates of violent crime: Detroit, Flint, Pontiac, and Saginaw. Given that this remained a period when MSP also faced tight budgets, it became imperative that MSP use systematic analysis of violent crime patterns and evidence-based strategies to best utilize limited resources in an effective and efficient fashion. DDACTS offered a model and was initially adopted in Flint in spring 2012. Additional training was provided to MSP personnel involved in these cities in SP and DDACTS during this same period.

Another important milestone of SPI was launched during this same period. In an effort to develop a technological platform that would ultimately be available throughout the entire organization, MSP decided to deploy a "Dashboard" system that would bring real-time data analysis on multiple functions of the organization to its employees. The MSP Dashboard brought the advantage of a system that could be available on laptops within patrol vehicles as well as desktop computers. Phase I was launched during spring of 2012 and was limited to the MSP command staff in a beta testing period. The Dashboard provided information based on crime incident reports from the Michigan Incident Crime Reporting (MICR) system, crime clearance data, mapping based on the post boundaries, traffic crashes, and MSP crime mapping and prediction analytics.




2012(a)
SPI Budget approved
Governor's Secure Cities Partnership – DDACTS focusing on violent crimes, four high-crime cities in Michigan: Flint, Saginaw, Detroit, and Pontiac
DDACTS began in Flint
Smart Policing Training & DDACTS to 2 squads of troopers going into high-crime cities in MI
Q1
Q2
Phase I of MSP Dashboard deployed to MSP command staff only (limited licenses); consisted of MICR tab, Crime Clearance tab, Creating Post Boundaries on map, Traffic Crashes tab, MSP only crime mapping and crash prediction
Dept-Wide Survey (6/29 last day for completion) of evidence-based activities administered and data collected


2012(b)
Crime analysis support provided to Secure Cities Policing (SCP) agencies (Hot spot, DDACTS maps
More detailed and refined crime analysis products provided for SCP (e.g., repeat problem locations)
Q3
Q4
2 more summer trainings of troopers / post commanders of Smart Policing & DDACTS
MSU presented results of the initial department-wide survey and discussed which would be useful for case studies
MSP Post Commanders and Assistant Post Commanders were trained on Smart Policing and DDACTS

This time period also witnessed activities conducted by the initial MSU RP team (RP-I). As part of an effort to develop a foundation for the implementation of SP in MSP, an employee survey was developed and conducted. The survey assessed the level of familiarity with the concept of SP, the routine use of data, and similar concepts. RP-I also developed a plan with MSP for the development of several cases studies in order to assess the degree to which MSP personnel were using data-driven processes. This summer 2012 period also saw additional rounds of training of troopers and post commanders on SP and DDACTS.

In late summer 2012, RP-I presented results from the employee survey. As will be discussed in subsequent sections of this report, the survey results indicated the need for training on SP, data-driven processes, and the new technological resources to support SP (e.g., Dashboard).

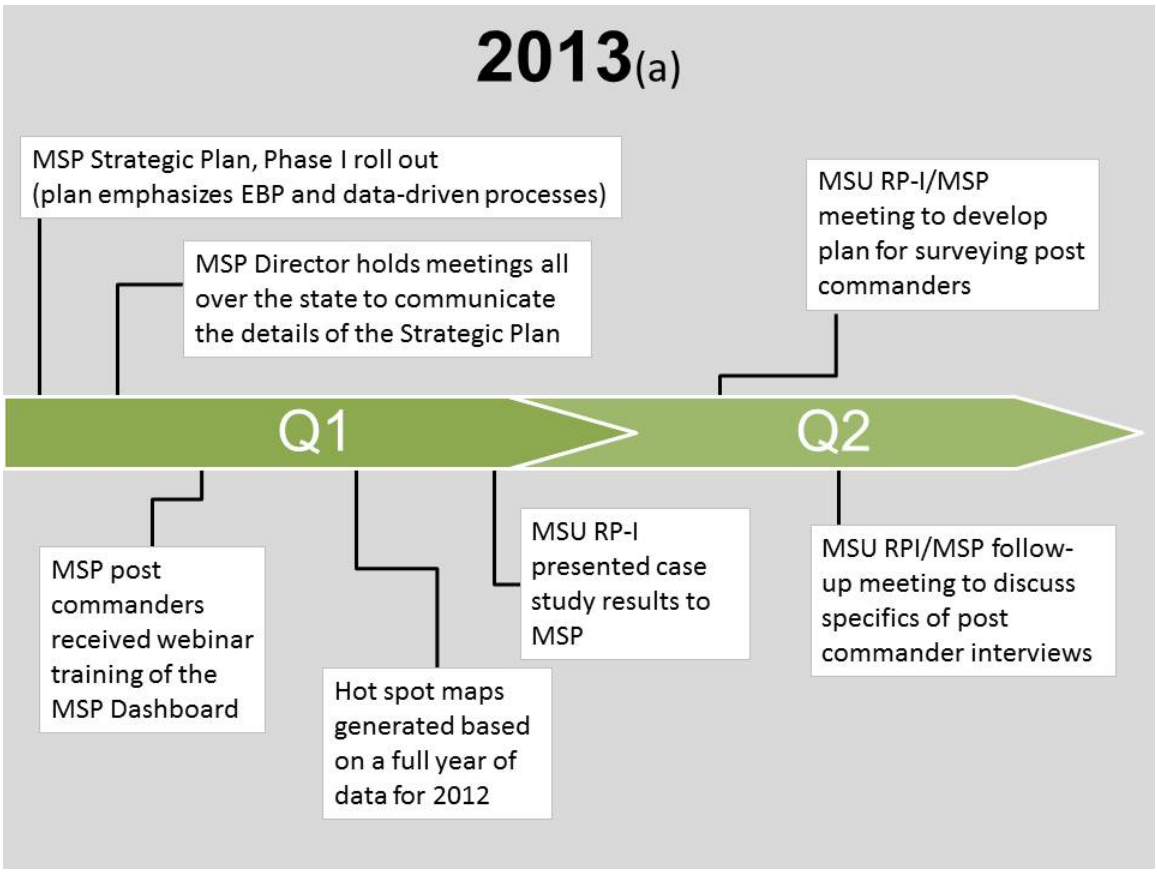
During late summer and into the fall, MSP further expanded its crime analysis support to the SCP. Crime hotspot maps and DDACTS maps were regularly developed and disseminated to support SCP efforts. Over time more refined and detailed crime analysis products were developed. Finally, the fall of 2012 witnessed continued training of troopers and post commanders on SP and DDACTS.

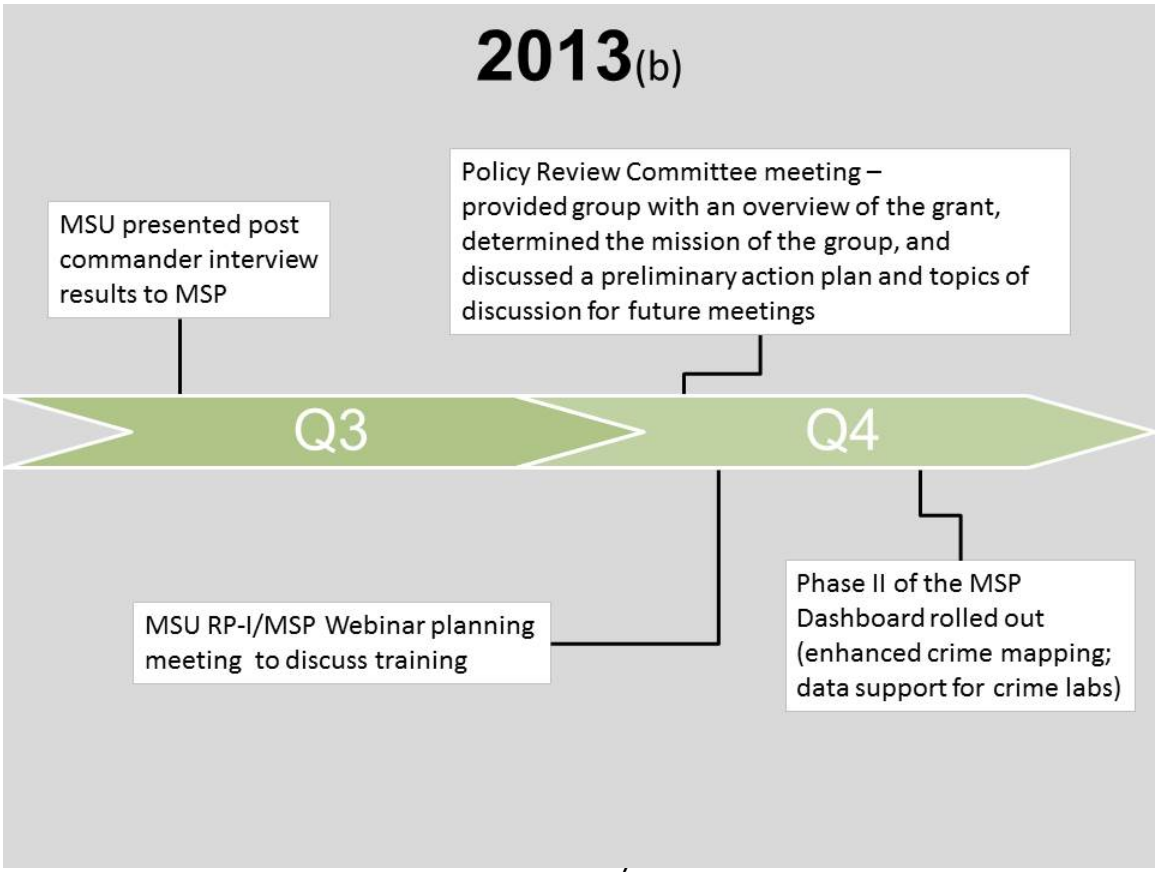
Early 2013 included the Phase I roll-out of a new MSP Strategic Plan. This was a critical step in the evolution of SP as it placed a firm commitment on EBP and data-driven processes. The MSP Strategic Plan called for the adoption of EBP and data-driven processes in all daily operations. The MSP Strategic Plan was given emphasis through mandatory meetings conducted by the Director of MSP throughout the entire state. This provided an opportunity to communicate the commitment to SP, EBP, and data-driven processes throughout the entire organization.

As an additional step to diffuse SP throughout MSP, all post commanders received webinar training on the Dashboard with the message that all commanders were expected to use data and analysis to deploy troopers.

RP-I worked with MSP to develop a series of interviews with post commanders. The interviews focused on having the commanders discuss the problems they considered most significant ("social harms") within the regions served by their post. The interviews also asked about the commander's perception of the technology and data available to support decision-making. As with the employee survey, the focus of the research was to assess the use of technology and data and to provide feedback to MSP on adaptations of technology or training needs. Around this time an MSP Policy Review Committee was established to consider the status of the SPI grant. This became a forum for which initial research findings could be presented and discussed to support further planning of the continued implementation of SPI.

The last quarter of 2013 also witnessed expanded refinement and roll-out of the Dashboard. This included system enhancements such as refined crime mapping as well as an expansion to a broader group of MSP users including field staff.


2013(a)
MSP Strategic Plan, Phase I roll out (plan emphasizes EBP and data-driven processes)
MSP Director holds meetings all over the state to communicate the details of the Strategic Plan
MSU RP-I/MSP meeting to develop plan for surveying post commanders
Q1
Q2
MSP post commanders received webinar training of the MSP Dashboard
Hot spot maps generated based on a full year of data for 2012
MSU RP-I presented case study results to MSP
MSU RPI/MSP follow-up meeting to discuss specifics of post commander interviews


2013(b)
MSU presented post commander interview results to MSP
Policy Review Committee meeting – provided group with an overview of the grant, determined the mission of the group, and discussed a preliminary action plan and topics of discussion for future meetings
Q3
Q4
MSU RP-I/MSP Webinar planning meeting to discuss training
Phase II of the MSP Dashboard rolled out (enhanced crime mapping; data support for crime labs)

In early 2014, several additional steps reflecting the further organizational adoption of SP occurred. The Executive Council approved a definition of EBP:

> Conventional policing has generally been based on random patrol, rapid response, and reactive investigations to 911 calls for service. Evidence based policing (EBP) uses the analysis of accurate crime data to develop strategies to anticipate crime and proactively deploy resources to reduce the number of calls for service and to deter offenders from committing crimes. Effective EBP relies upon the use of proven, research-based techniques to reduce crime through problem solving as well as the efficient tasking of resources to make maximum use of available employee time. This occurs through fiscally responsible enforcement, directed patrol, education, and the development of partnerships.

Additionally, trooper recruit training was modified to include problem solving, EBP, and data - driven philosophy throughout the curriculum.

In addition to basic training, additional planning focused on a department-wide training program that would be delivered through webinar technology. The ambitious goal was to train all personnel to support the organization-wide implementation of EBP, SP, and data-driven processes. Major efforts occurred throughout 2014 to develop webinar training scripts, collect information from the field on what should be included in the training as well as examples of EBP, and collect photos and videos that could be used in the training materials.

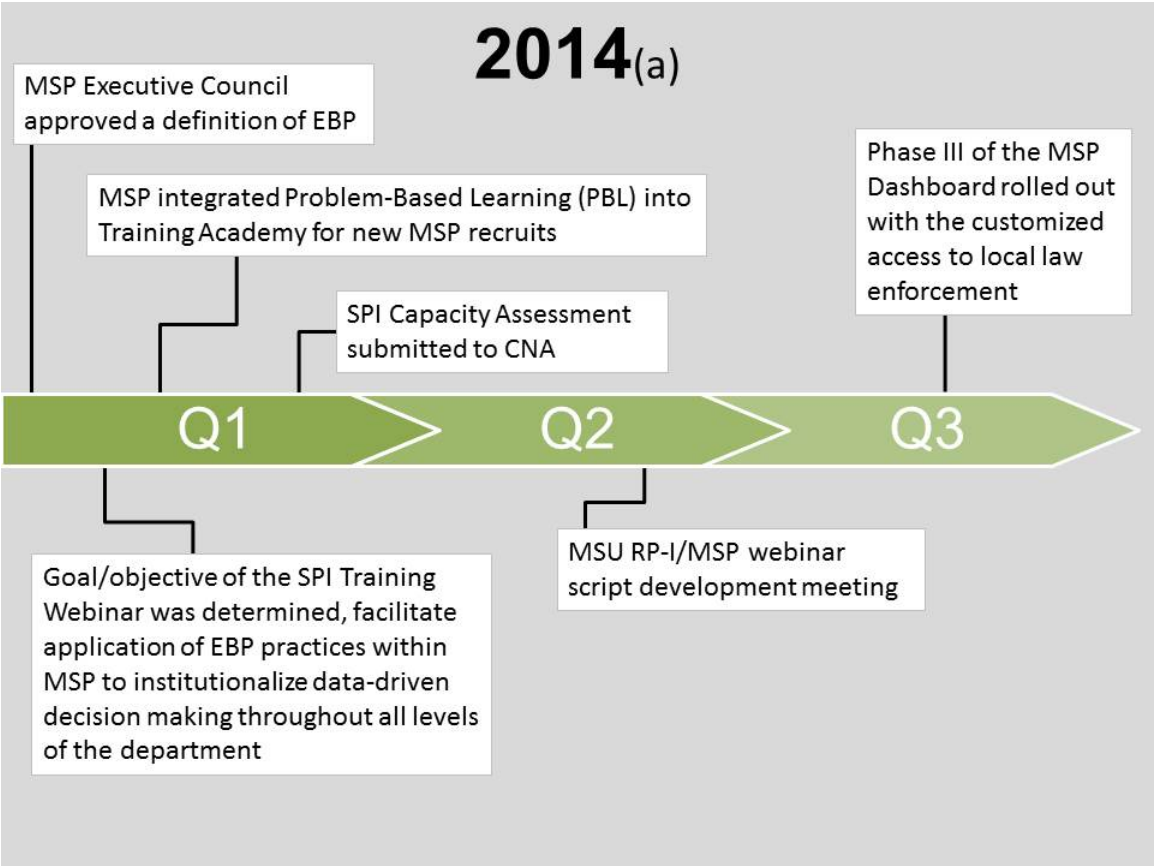
This year (2014) also witnessed continued refinement of the Dashboard. Reflective of the SP principle of expanded partnerships, the Dashboard was made available to partnering local level law enforcement agencies. In this way, MSP demonstrated its commitment to SP and data-driven processes not only within the MSP organization but throughout the law enforcement community of the state.

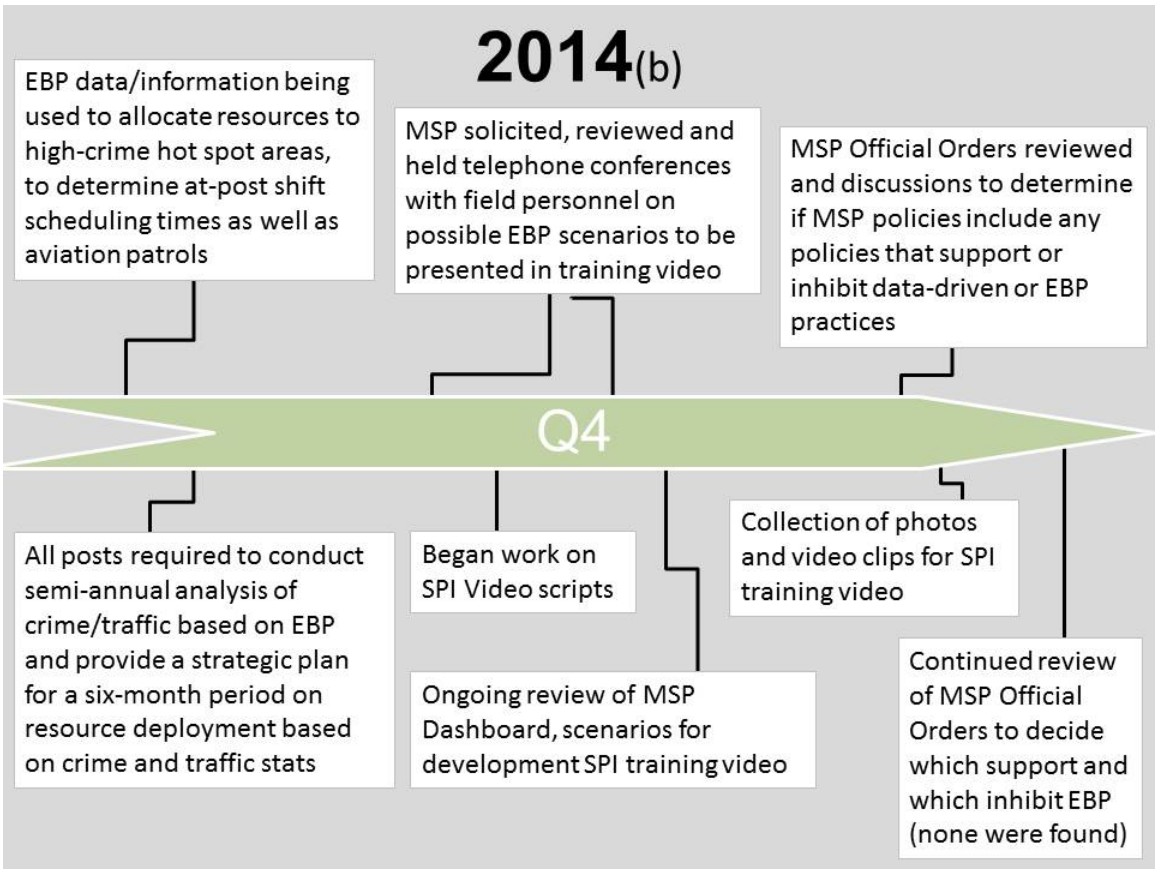
As an extension of the organizational MSP Strategic Plan, the data included in the Dashboard were required to be used for post shift scheduling and aviation patrols. Indeed, by fall 2014 all posts were required to conduct an analysis of crime and traffic accident patterns and then to develop a strategic plan for the data-driven deployment of resources and strategies.

During this period and into 2015, the second MSU RP-II began to collaborate with MSP. Working with the planning team in the Grants and Community Services Division, several steps were taken to review MSP official orders to determine if there were any existing orders that might be in conflict with the strategic commitment to SP, EBP and data-driven processes. The RP-II continued to pose questions about potential conflicts involving official orders during interviews and interactions with MSP personnel. No such orders were identified.

By early 2015, it was evident that significant progress had been achieved in development and deployment of the Dashboard and in the adoption of SP in many divisions and activities of MSP. Consequently, a major focus of 2015 was the development of the SP training video. Filming of various segments began in early 2015. Additionally, a series of Dashboard scenarios were planned and developed to provide concrete examples and “hands-on” quality to the training so

that participants would gain the skills needed to effectively utilize the Dashboard as a technological support for SP and EBP. A web-based resource page was also developed. This major training effort included considerable planning and review at multiple levels of the organization, including the command staff. An additional planning component involved collaboration with RP-II to develop a post-training survey to measure the extent to which training participants reported a familiarity with key concepts and an understanding of the resources to support SP, EBP, and data-driven processes.

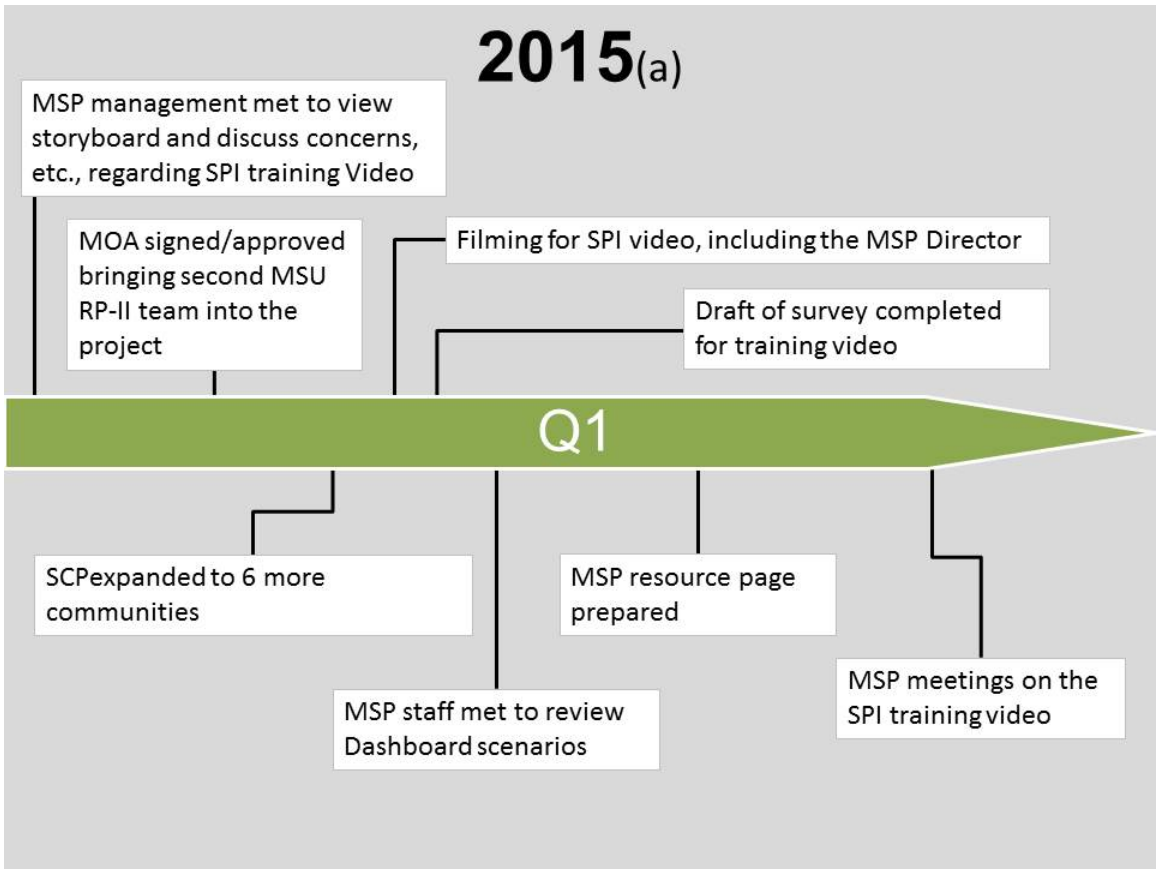


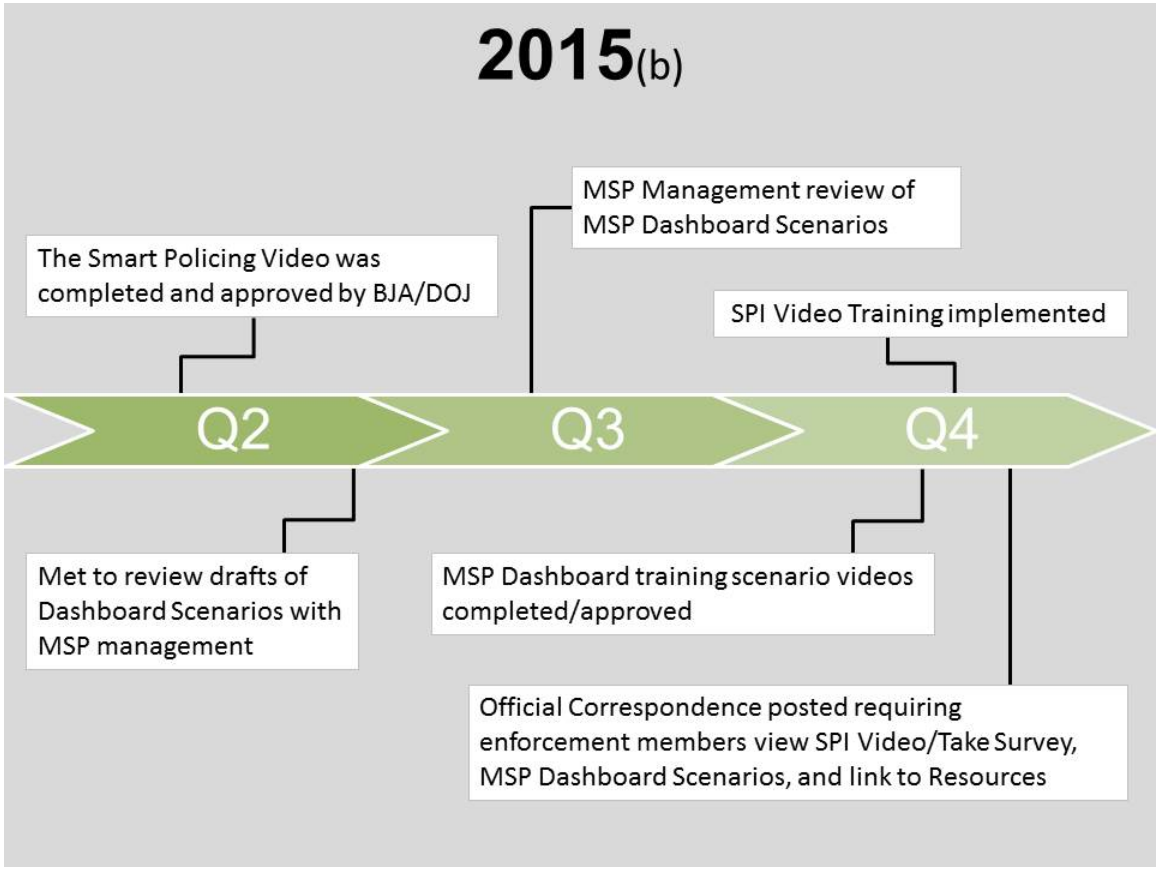


Another major development of 2015 involved the expansion of the SCP to an additional six Michigan cities. The cities were chosen due to their high rates of crime thus reflecting the principle of data-driven decision-making.

Finally, the commitment of MSP leadership to SP, EBP, and data-driven processes was reflected in Official Correspondence that required all enforcement employees to complete the SPI training webinar, the Dashboard scenarios, and access the web-based EBP resources.

As the timeline figures reflect, the MSP took on the ambitious goal of implementing SP, EBP, and data-driven processes throughout the entire organization. As is evident, a great deal of activities, particularly technology development/deployment and training, occurred during the period of the official SPI grant. The following sections represent an assessment of the extent to which these activities have had an impact on various divisions and activities of the MSP.


2015(a)
MSP management met to view storyboard and discuss concerns, etc., regarding SPI training Video
MOA signed/approved bringing second MSU RP-II team into the project
Filming for SPI video, including the MSP Director
Draft of survey completed for training video
Q1
SCPexpanded to 6 more communities
MSP staff met to review Dashboard scenarios
MSP resource page prepared
MSP meetings on the SPI training video


2015(b)
The Smart Policing Video was completed and approved by BJA/DOJ
MSP Management review of MSP Dashboard Scenarios
SPI Video Training implemented
Q2
Q3
Q4
Met to review drafts of Dashboard Scenarios with MSP management
MSP Dashboard training scenario videos completed/approved
Official Correspondence posted requiring enforcement members view SPI Video/Take Survey, MSP Dashboard Scenarios, and link to Resources

Problem Assessment Survey

During summer 2012, RP-I worked with MSP to conduct an employee survey. The survey focused on prior training, familiarity with concepts related to data-driven practices and SP, how often MSP employees engage in activities consistent with SP, and the use of various data sources. Over 800 respondents completed the survey including sworn and civilian employees. The largest group of respondents was from the trooper rank (48.2%), just under one-third was sergeants (30.9%), and the remaining ranked as Lieutenants or higher (20.9%). More complete details on the survey are presented in Appendix A.

The survey provided an assessment of the current state of familiarity and use of SP principles. For example, respondents were asked how frequently they engaged in strategic planning, coordinate with other agencies, use data to identify problems, rely on evidence for what works, and how often they use data to measure organizational practices and outcomes. As would be expected, higher ranking officials were most likely to report engaging in such practices and sworn employees were more likely than civilians to be involved in such SP practices. The overall level of engaging in SP practices fell in the category of a "few times" during the prior year. The most common activities were coordinating with other agencies and strategic planning. Consistent with other policing research, the least common activities were measuring outcomes (Cordner and Biebel, 2005).

As would be expected, the survey revealed that sworn employees were more likely to have participated in training on community policing, problem oriented policing, crime analysis, and EBP. An important finding was that employees who had received training were more likely to engage in SP activities than were those not having received such training. Consequently, a major focus of the SPI was to provide training in SP principles as well as in the technology being developed to drive SP.

Strategic Plan

As noted in the timeline, the MSP Strategic Plan was rolled out in early 2013. The MSP Strategic Plan began with the MSP mission: "Provide the highest quality law enforcement and public safety services throughout Michigan." The strategic plan set the foundation for SP through specific goals as well as the identification of performance metrics. Sample statements in the MSP Strategic Plan include:

- "…operational efficiencies through the use of advanced technologies and data-driven policing."
- "…ensure future staffing assignments are tied to an operational nexus and based on data."
- "Utilizing DDACTS and evidence-based policing strategies, patrol and investigative resources will be directed to high-crime areas serviced by the MSP to increase presence and enforcement…."
- "Conduct monthly statistical analysis of the Secure Cities Partnership (SCP) communities and semi-annual statistical analysis in each post area, to ensure the necessary coverage is in place based on crime and traffic crash data, economic conditions of communities, and the availability of other resources."

- "…every post will develop at least one traffic safety initiative, supported by crash data, annually."
- "The Forensic Science Division will achieve an average turnaround time of 30 days by employing a diverse set of strategies that bring laboratory capacity into balance with demand."
- "The availability of real-time crime data enables law enforcement to quickly identify crime trends, deploy resources to combat hot spots of criminal activity, and access relevant information that aids in investigations. By increasing the number of law enforcement officers using the SRMS, more real-time data will be captured and made available to all users on the system, enhancing efficiency and providing for more informed decision-making by police administrators."
- "By providing access to the Criminal Justice Information Center (CJIC) Dashboard, law enforcement agencies will further enhance their ability to analyze crime and crash data, and to apply evidence-based policing strategies, such as Data-Driven Approaches to Crime and Traffic Safety (DDACTS), to improve public safety."
- "Develop an activity analysis for the department-supervised multijurisdictional drug task forces to be used to track progress toward meeting the goals of the statewide drug enforcement strategy."
- "Currently, there are numerous databases and applications (employee information, equipment inventories, phone lists, etc.) used on a regular basis throughout the department that do not interact with each other. By integrating these sources of data, the quality of information will be enhanced and redundant entry of data will be lessened." (Michigan State Police, Strategic Plan)

As is apparent in these statements, the MSP Strategic Plan continually emphasizes data-driven processes, EBP, performance measurement and metrics. The plan was reinforced by meetings throughout the state convened by the Director of MSP requiring the attendance of ALL members of the MSP, civilian and enlisted. Additionally, all divisions were required to develop strategic plans, use data and analysis in the plans, identify metrics, and provide regular reports on progress.

To support the implementation of the MSP Strategic Plan, two areas of emphasis included data use and training.

Use of Data and Technology

As noted in the MSP Strategic Plan, MSP made a commitment to use technology to integrate information systems and provide all members of MSP with the information needed to support data-driven processes and EBP. In this section of the report we review the key technological platform for supporting data-driven processes as well as provide examples of data use in various divisions of MSP.

The key mechanism for the dissemination of information and data was the MSP "Dashboard" technology system. The Dashboard provided a platform to provide ready access to multiple sources of data and information. MSP benefits by the fact that Michigan is a National Incident Based Reporting System (NIBRS) state with MSP serving as the repository for crime incident

data from all law enforcement agencies. Historically, the Michigan NIBRS data (known as MICR) would be about one year old before being available for analysis. However, MSP made a commitment to more timely data review so that it could be integrated with the Dashboard technology. The result is that the Dashboard provides more timely crime incident data for the entire state.[2] Along with traffic crash data, the Dashboard can provide detailed data broken down by different regions of the state with programs that routinely provide crime analysis information such as seasonal, weekly, daily and time of day patterns; crime and traffic crash mapping; and numerous tactical sources of information. Performance metrics for various divisions are included in the Dashboard system.

The Dashboard was initially rolled out to managers and supervisors to support their planning, deployment of resources, and performance metric reporting. The information was disseminated through the Dashboard but additionally, supervisors were required to use the Dashboard information in their planning and reporting. For example, post commanders were required to submit semi-annual plans on crime patterns and their plans to address the most significant crime problems in their respective regions.

The Dashboard also supported the community engagement activities conducted by post commanders and all post personnel, including the post Community Service Troopers (CSTs). The Dashboard provided timely data that could be used in community meetings or other forums for community engagement. One example uncovered in the interviews was a situation that arose in the Belle Isle Park in the Metropolitan Detroit area. MSP had recently assumed responsibility for patrolling Belle Isle and received some citizen complaints about issuing excessive traffic tickets. The Dashboard data allowed MSP officials to quickly access data that dispelled the notion of excessive citations being issued.

Overview of the Dashboard

The Dashboard was designed as a data hub, where members of law enforcement can pull together data from several different sources including MICR, traffic crash, commercial vehicle enforcement, and daily briefings. The Dashboard is designed to sort data by a large number of categories, including: location, arrest data, stolen vehicle information, offender description, and time and day of offense. One unique aspect of the system is the capacity to map crime and traffic crash data anywhere in the state using these categories. Officers and administrators with access can then map a query of specific interest (e.g. burglaries committed on Friday nights from 8pm to 2am in a particular geographic location, perhaps by a particular offender based upon arrest data) and map them in conjunction with other queries (e.g. robberies committed in the same time frame and place) to attempt to identify patterns in crime and traffic crash data. This can be particularly useful considering the brief and localized nature of some crime and crash trends, and the capacities of local law enforcement analysts, who are often overburdened and struggle to field many individual requests while at the same time providing overviews of crime trends in larger geographic regions, wider timeframes, and for multiple crimes (e.g. total violent crime). Officers can then save a query (e.g. “Friday Night Burglaries in North-Town”) for use later, which is designed to minimize the burden on officer time.

[2] The MSP MICR system and thereby the Dashboard are dependent on the timely submission of accurate crime data from local law enforcement agencies.

The Dashboard was later rolled out throughout MSP including for use by troopers. In this sense, individual officers are provided the tools to run the types of time and location sensitive tactical analysis that they value in their day-to-day work without overburdening law enforcement analysts who are tasked with providing largely strategic analysis, often times at the city or state level.

Dashboard Use

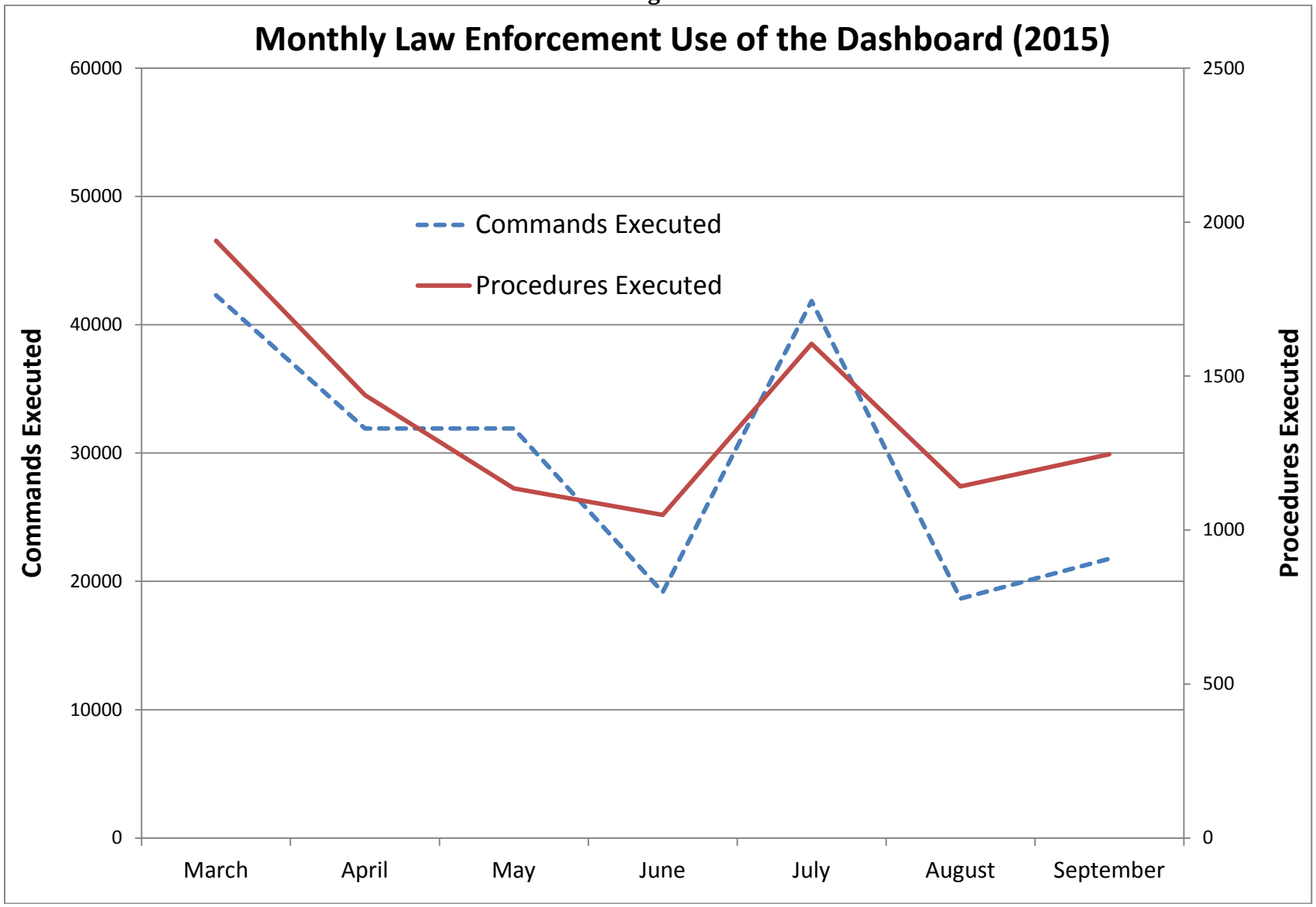
Figure 1 shows monthly Dashboard traffic from March, when Dashboard use was first tracked, to September, 2015. *Commands Executed* refers to the distinct number of times a user viewed different tabs or pages on the Dashboard. It would not be uncommon for a user, particularly a new user, to jump between pages and tabs on the Dashboard dozens of times in one sitting. *Procedures Executed* refers to the number of unique queries a user ran (e.g. crime mapping of a particular offense or pulling data on every arrest for a particular day). It would be more common for a user to run only a few unique queries in a single sitting, hence the large disparity between the number of Commands Executed and Procedures Executed. Both Commands and Procedures appear to change in concert over time.

Overall, change over time in Dashboard traffic, or use, appears to be consistent with the introduction of any new technology. Use varies over time as new users acclimate and familiarize themselves with the parts and components of the new technology. This is particularly evident in the abrupt increase in Dashboard use in the month of July, when the MSP held two trainings for the Dashboard. The data reinforce the importance of training and suggest that use will increase over time as more individuals gain familiarity and attend trainings provided by the MSP.

As noted above, the Dashboard has been primarily used by command staff, which have used the Dashboard to track progress in meeting the MSP Strategic Plan "metrics" for which they are responsible. Similarly, mid-level members of the organization that supervise patrol (e.g. sergeants) utilize the Dashboard for deployment of troopers. To date, there was less use of the Dashboard by troopers. This likely reflected that the training was initially provided to managers and only recently provided to all troopers. Additionally the time constraints troopers' face to learn and use the system, suggest that use will increase over time through training and experience with the Dashboard. As described subsequently, MSP made a major effort to expand training to troopers in the fall of 2015.

The Dashboard is continually refined. Several new "tabs" in the Dashboard are intended to provide additional utility for troopers. For example, a warrants tab is designed to allow troopers to run queries that pull active warrants and map them based upon offender known address. This and similar revisions are intended to further aid troopers and their supervisors for both strategic and tactical analysis of time sensitive crime and crash trends.

Figure 1


Monthly Law Enforcement Use of the Dashboard (2015)
Commands Executed
Procedures Executed
60000
50000
40000
30000
20000
10000
0
2500
2000
1500
1000
500
0
March
April
May
June
July
August
September

Michigan Intelligence Operations Center

In addition to the Dashboard, MSP has expanded access to data and analysis through the Michigan Intelligence Operations Center (MIOC). The MIOC is a 24-hour fusion intelligence center that represents multiple partnerships with federal, state, and local partners. As such the fusion center collects information, conducts analysis that transforms information to intelligence, and disseminates intelligence to troopers and MSP command, as well as to local and federal law enforcement partners.

Examples of Data Use

Multijurisdictional Drug Task Forces

One of the strategies MSP has utilized to address illegal drug trafficking is through the multijurisdictional drug task forces (MJTFs) that involve partnering with local law enforcement. The 22 task forces serving Michigan, comprised of partnerships with local police departments and sheriff's agencies, are supported by federal funds provided through the Byrne Justice Assistance Grant (Byrne JAG) program. Through the years, Byrne JAG funding has experienced reductions. Consequently, MSP has sought to use data and metrics to improve the effectiveness and efficiency of the task forces.

The philosophy adopted by MSP, working in collaboration with the various task forces, is to use data to set priorities. The priorities are based on harm reduction principles. Specifically, MSP has recently deployed a data reporting system that establishes priorities utilizing a tier ranking based on a drug's amount of harm caused. Each drug category is assigned a priority value along with indicators of trafficking, and the level of trafficking, being assigned a point value. This new metric system allows for high priority drugs and higher tier arrests (e.g., large amounts of heroin, cocaine, or prescription drugs) to be given more value than low priority drugs and lower tier arrests (e.g., smaller amounts of marijuana).

Although relatively new, the early data submitted by the MJTFs suggests that the use of the new metric system has resulted in a shift in the priorities of the MJTFs. Data are submitted on a quarterly basis by the MJTFs. The initial two assessments conducted have witnessed an increase in arrests for more harmful substances and larger amounts of illegal substances (suggesting priority trafficking operations). For example, heroin, prescription opiates, and cocaine arrests increased from 6,690 to 10,896 from the second quarter of 2014 compared to the second quarter of 2015 (63% increase). Marijuana arrests increased a more modest 1,917 to 2,483 (29% increase). More telling, however, is that all of the increase in marijuana arrests was for Tier IV drug amounts (500 to 1,350), the most serious type of trafficking (Nguyen and McGarrell, 2015).

These data should be considered preliminary. However, they are clearly evidence of MSP's commitment to using data and metrics as a way to influence enforcement priorities and activities and the early evidence suggests they are influencing the priorities of the MJTFs.

Forensic Science Laboratory System

MSP Forensic Science Division (FSD) operates a network of seven regional forensic science laboratories strategically located to serve both urban and rural communities of the Great Lakes State. As is the case with forensic science laboratories nationally, the increased use of forensic analysis in the investigation of crime has resulted in significant resource demands on the laboratories. This is particularly true with the expanded interest in DNA analyses and the development of systems such as the Combined DNA Index System (CODIS) database. The MSP laboratories provide expertise in seven disciplines: biology/DNA; firearms and toolmarks; trace evidence/questioned documents; toxicology; crime scene response/bloodstain analysis; latent prints; and controlled substances.

The use of data, the Dashboard, and metrics were very apparent during visits to the Lansing Forensic Science Laboratory. Continually streaming data are provided to the Laboratory directors on the status of evidence submissions, case status, average time for case processing, backlogs and laboratory capacity across the seven disciplines described above. This allows for efficient management of resources across the Laboratory system. Thus, if a particular laboratory is experiencing a backlog in processing of particular types of evidence (e.g., DNA, ballistics, or a blood sample for drug testing), managers can look across the network of laboratories and then facilitate analysis of the evidence at a laboratory currently experiencing more capacity within the particular discipline.

Computer Crimes Unit

The MSP Computer Crimes Unit has responsibility for digital forensics analyses involving computers, cell phones and similar technology. The unit also has responsible for Internet investigations. The unit has both reactive responsibilities as computer and digital evidence is submitted to the unit as well as proactive enforcement responsibilities that typically involve investigations of criminal behavior conducted on the Internet.

MSP managers at the Computer Crimes Unit were similar to senior staff at the Forensic Science Division in terms of being able to articulate the importance and value of metrics in the management of the unit. Data on cases assigned to the computer crimes unit are continually used to manage workflow assignments and establish priorities. For example, the unit is committed to expand proactive investigations but must balance this priority with the need to provide support through evidence forensic analysis. Unit managers talked about the importance of the real-time data for managing these proactive and reactive missions.

Secure Cities Partnership Posts

The MSU RP-II team is involved in several crime and violence reduction efforts that occur within the MSP SCP. This includes Detroit and Flint. This has allowed RP-II to observe the extent to which MSP post personnel are using data as they engage in secure cities planning and deployment.

The initial exposure was in the Flint DDACTS initiative. MSP used data to identify crime and traffic crash hotspots throughout the city of Flint. MSP DDACTS patrols were then deployed based on the crime patterns (see subsequent DDACTS case study). MSP supports similar data-driven processes in Flint through its ability to provide ongoing crime data and analysis. Specifically, MSP supports a monthly meeting of law enforcement and security partners in Flint that review crime trends and patterns provided by MSP and then jointly plan enforcement, problem solving, and prevention strategies.

In Detroit, MSP is an active partner in a series of violence reduction initiatives. Most telling is MSP's deployment of patrols in hotspot areas of the 9th precinct that has witnessed the highest levels of firearms violence in the city.

Discussions with post commanders in both Flint and Detroit provided clear evidence of their use of crime data for crime problem analysis, deployment of resources, and tracking of metrics.

Training

As discussed in the accomplishments and timeline section, MSP placed considerable emphasis on training. This was evident in a series of trainings on the DDACTS model, on the roll-out of the MSP Strategic Plan, and the initial training of MSP command staff and mid-level supervisors on the concepts of data-driven processes, EBP, performance metrics, strategic planning, SP, and the Dashboard.

MSP also recognized the need to integrate SP principles into recruit training. MSP runs its own basic recruit training academy at its training facility in Lansing. Recruit training is governed by the Michigan Law Enforcement Commission on Law Enforcement Standards (MCOLES). MCOLES sets training standards and all police academies in the state must meet the basic standards. MSP's training academy meets these standards and then follows additional standards and training requirements developed at the organizational level.

Consistent with the MSP Strategic Plan and the organizational commitment to SP, the training academy staff altered its approach to basic recruit training in 2014. Although still committed to addressing the standards, the pedagogy was altered to follow principles of Problem-Based Learning (PBL) throughout the curriculum. Training academy staff developed a problem solving model with scenarios and case studies. To develop skills in applying the model, recruits were given problems throughout the course of the training that they had to address from a problem-solving framework.

The shift to PBL required adjustments in the curriculum and delivery of training. Historically, recruit training involved a series of distinct modules on various training topics intended to shape knowledge, skills and abilities. Thus, training standards required X numbers of hours devoted to specific topics (e.g., investigations, ethics, driving skills, firearms). Although the requirement for minimal hours in various topics remained, the integration of PBL led to a "building block" approach whereby problems were assigned that crossed various functional modules. Thus, addressing a specific problem could have relevance for training in crime scene processing,

witness interviewing, criminal law and criminal procedure, victim rights, interpersonal skills, and other modules.

Reports from academy staff indicated that there was some initial reluctance from some instructors because the PBL approach required alterations in the timing of the delivery of some modules of instruction. Additionally, instructors had to consider how their particular topics connected to other areas of instruction in the PBL context. Academy staff believed that the initial concerns were overcome. Additionally, they reported that recruits responded very favorably to the active learning approach embodied in the PBL curriculum.

In addition to recruit training, PBL was introduced through in-service training provided to mid-level managers. This included courses on First Line Supervision and the School of Staff and Command. These courses were developed and offered in collaboration with the MSU School of Criminal Justice and were based on the principles of PBL. Participants learned principles of problem solving but were also put in team contexts where they had to use problem solving approaches to address problems encountered in their work environment.

Most recently, MSP developed extensive training on the Dashboard system that included scenarios intended to provide realistic examples of Dashboard utility. The Dashboard training was delivered through MSP's online training system so that it could be offered to maximum numbers of employees throughout the state in a compact time period at their convenience.

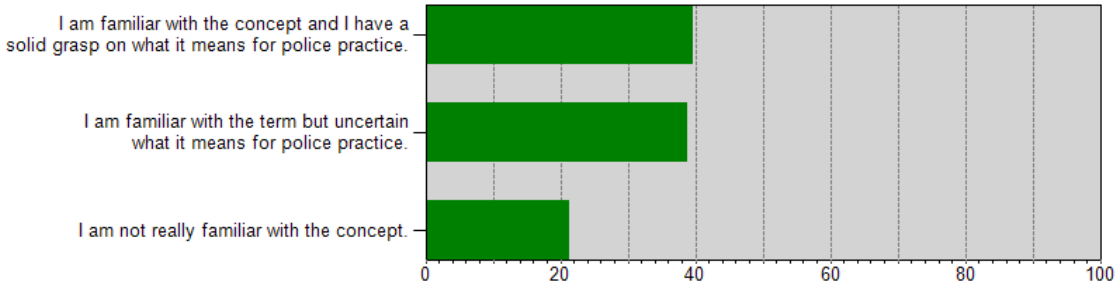
Training Survey

In the fall of 2015, online training to provide an overview of the Dashboard and the concept of Smart Policing was introduced to department members. The training included a video on SP with examples on how MSP was employing SP principles and six tutorials on the use of the Dashboard. The training began with a survey constructed by the MSU RP-II team in collaboration with the Grants and Community Services Division. The survey attempted to gauge familiarity with concepts of SP and current usage of the Dashboard. The survey provided baseline measures for SP among all enforcement in MSP.

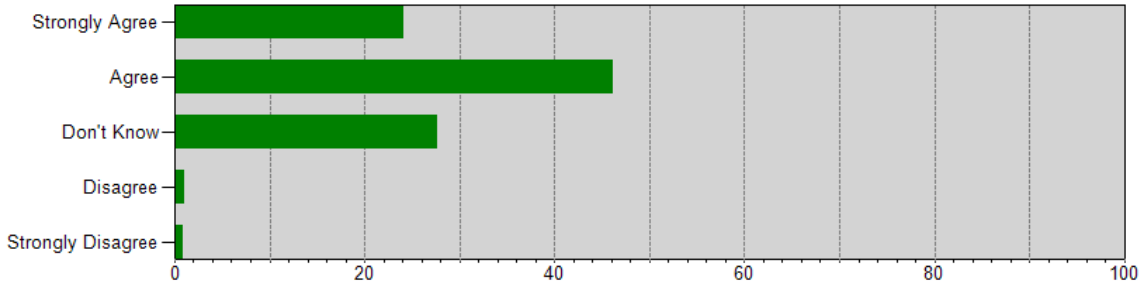
The first section of the survey asked about the employee's familiarity with EBP and the perceived level of commitment of MSP to these principles. As demonstrated in Figure 2, most respondents were familiar with the concept of EBP though relatively equal numbers were uncertain what it means in practice as those reporting a solid grasp on what it means for practice. There were high levels of support for MSP's commitment to EBP and the use of data and analysis to inform operations.

Figure 2 Reported Familiarity and Perceived Commitment to EBP and Data-Driven Processes

How Familiar Are You With the Concept of Evidence Based Policing?



The MSP is Committed to Adopting the Principles of Evidence-Based Policing



The MSP is Committed to Increasing the Use of Data and Analysis to Inform Operations

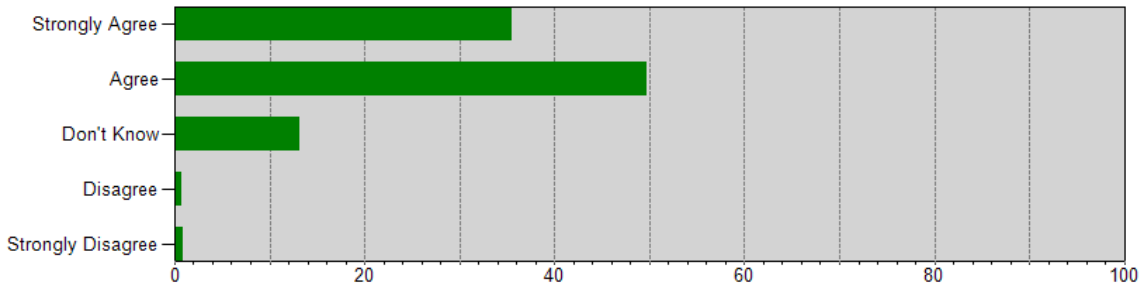
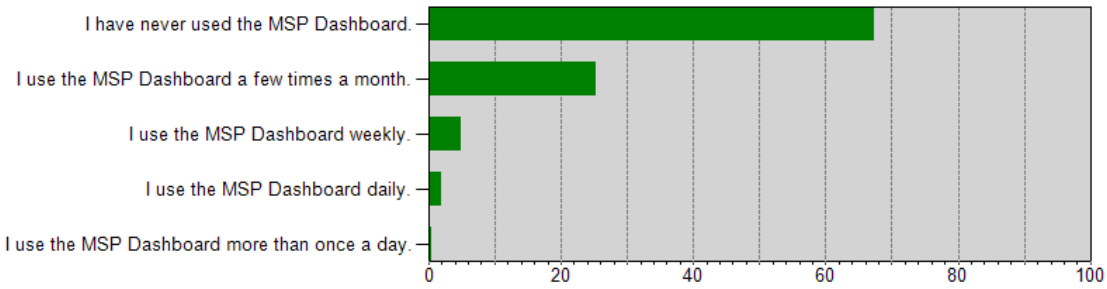


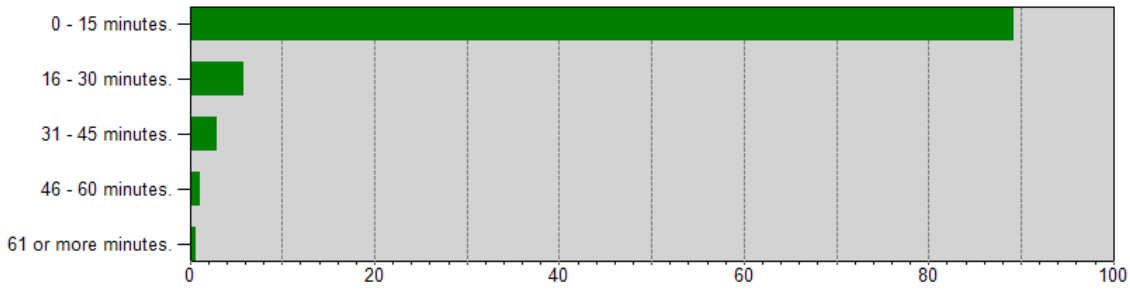
Figure 3 indicates that although these respondents are familiar with the concepts, they have not yet reached the stage of regular use of the Dashboard tool to support the implementation of data-driven processes and EBP. Of course, this level of use was not unexpected as the reason for the training was to increase familiarity and provide the skills necessary to use the Dashboard. Further, the survey does not distinguish by rank. Thus, it is likely that mid- and upper-level managers reflect the respondents reporting daily and weekly usage whereas the troopers and other line-level employees would not be expected to use the Dashboard extensively prior to this training. Consequently, these results serve as a baseline to assess whether the training leads to increased usage.

Figure 3 Reported Use of the Dashboard

How Frequently do You Use the MSP Dashboard to Direct your own or Subordinate Policing Activity?



In A Typical Work-Week, How often do you Use the MSP Dashboard?



Additional items were similar with respondents reporting that the adoption of EBP had minor to moderate impact on their policing role and in their geographic region. Again, these results are to be expected given that the survey was administered in conjunction with the major training on SP, EBP, and data-driven processes. Consistent with the principles of a data-driven organization, the survey provides baseline data that could be re-examined in the future to assess progress in the implementation of SP throughout the organization.

Case Studies

As an additional research strategy for assessing organizational change, several case studies were conducted. Two of these were launched by RP-I with follow-up by the RP-II research team. The third, a study of the DDACTS initiative in Flint, was conducted as part of the Michigan Justice Statistics Center by members of the RP-II research team.

Montcalm County Metal Theft Cases

A common crime in some agriculture and low population areas (especially unoccupied homes, electrical substations and worksites, cellular towers, construction sites, telephone and electrical lines, power company trucks, wells, and near farm irrigation systems)[3] is the theft of bulk metal

[3] http://www2.michfb.com/counties/policy/59; https://www.fbi.gov/stats-services/publications/copper-thefts

(copper, steel, aluminum, brass, and nickel), particularly wire. These metals are commonly considered important to the nation's infrastructure and are also used extensively in the medical field.[4] Thieves sell the stolen metals for scrap, sometimes thousands of pounds at a time and for substantial payouts. Depending on scrap prices of the metals taken ($4.50/pound for copper in late 2011)[5], amounts stolen can be worth tens to hundreds of thousands of dollars, with the resulting damage, repairs and insurance claims in some thefts reaching six-figures.[6]

Once wire insulators are burned or otherwise stripped away, it is particularly difficult to trace stolen wire back to the original source. Thieves then sell the generic wire to scrap yard owners. In an effort to stem this emerging crime, a new Michigan law, which required scrap yards to record seller information, to maintain records, and that assessed felony penalties and fines, was implemented in 2009.[7]

Organized groups are common perpetrators in these cases, and groups can include drug addicts and gangs.[8] In one three month period in 2013 in Southeast Michigan, thieves targeted one power company's trucks 41 times,[9] as the remoteness of many of these crime scenes allow criminal groups to repeat the crime in the same or a nearby areas with near impunity.
A series of relevant and related cases in Montcalm County (Southwest Michigan) from 2008 to 2011 underscored this type of theft, where the theft of copper wire in agricultural areas had become common. In one particular investigation, significant amount of copper irrigation wire from an irrigation pivot post was reported to police. MSP and county detectives worked together to develop information that was newly recorded by scrap yards in accordance with the 2009 state law. Along with law enforcement intelligence, detectives identified suspects, associates of suspects, and additional investigative information. Detectives were able to subsequently place trackers on some suspect vehicles. Law enforcement efforts resulted in the arrest and convictions of five suspects.[10] The group had stolen wire from several locations in the county, mostly farms. The penalties associated with the new law also allowed detectives to leverage their interviews with defendants.

MSP also used the opportunity to educate scrap yard owners about the new law, worked with insurers, and worked with farmers to advise them about possible evidence (and evidence preservation) that they might encounter should they become theft victims.

Summary

The MSP approach to addressing scrap metal theft provided evidence of the influence of SP principles. Scanning crime issues revealed growing concern with this emerging crime in several MSP regions. MSP and partnering law enforcement agencies used newly available data from

[4] https://www.fbi.gov/stats-services/publications/copper-thefts
[5] http://www.nasdaq.com/markets/copper.aspx?timeframe=10y
[6] http://greatlakesecho.org/2013/02/26/copper-thieves-hit-farm-irrigation-systems/
[7] http://www.michigan.gov/formergovernors/0,4584,7-212-57648_21974-206355--,00.html
[8] https://www.fbi.gov/stats-services/publications/copper-thefts
[9] http://www.wxyz.com/news/local-news/investigations/copper-thieves-caught-on-camera
[10] http://thedailynews.cc/2011/12/09/organized-crime-ring-member-sent-to-prison/

scrap yards to analyze suspicious patterns and used this information to drive investigations. Additionally, MSP partnered with the private sector to educate stakeholders likely to be affected by scrap metal theft.

Kent County Narcotics Task Force (a.k.a. Metropolitan Enforcement Team)

In 2009, a MSP report listed cocaine, heroin, marijuana, and MDMA (ecstasy) as the primary drug threats in the State of Michigan. The report also noted a 91 percent increase in methamphetamine clandestine laboratory incidents from 2007 (172) to 2008 (329).[11] Further, the report noted that 61 percent of persons incarcerated in the state had histories of drugs, alcohol, or both, and that Michigan ranked 13th nationally for the number of persons under age 18 with drug abuse violations in the year 2007. Also, from 2000 to 2011, the rate of hospitalizations in Michigan involving opioids (heroin, morphine, methadone, opium, and synthetic drugs with a morphine-like effect) more than doubled from 9.2 to 20.4 per 10,000 population.[12]
Grand Rapids, Michigan, with a population estimate of just fewer than 200,000 in 2014,[13] is located in Kent County (population estimate 629,237 – 2014).[14] It is the largest city in west Michigan and is known as "Furniture City" due to a history of furniture manufacturing, and more recently as "River City" as the Grand River flows through the heart of the city. Grand Rapids has a diverse local economy consisting of health care, information technology, manufacturing, and educational institutions, to name a few.

Narcotic challenges in Michigan have been mirrored in Kent County. In 2011, the National Drug Intelligence Center listed Kent County as one of four counties in the west Michigan region that comprised a high intensity drug trafficking area (HIDTA).[15] In 2006, 2,934 reported narcotics laws violations were recorded by the MSP in the county.[16] In 2013, the Kent County Medical Examiner annual report noted that death due to heroin had more than doubled from 2009 (7 deaths) to 2013 (18 deaths).[17]

In order to address these issues in Kent County, the community relies upon a multijurisdictional county-based task force originally formed in 1993. Known as the Metropolitan Enforcement Team, or MET, the team continues to operate and is comprised of officers from the Grand Rapids Police Department, the Kent County Sheriff Department, the Kentwood Police Department, the East Grand Rapids Department of Public Safety, the Wyoming Police Department, and the Michigan State Police.

[11] http://www.michigan.gov/documents/msp/MichiganDrugs_277448_7.pdf
[12] http://www.michigan.gov/documents/mdch/Opioid-Related_Hospit_2000-2011_05-31-13_427136_7.pdf
[13] http://quickfacts.census.gov/qfd/states/26/2634000.html
[14] http://quickfacts.census.gov/qfd/states/26/26081.html
[15] http://www.justice.gov/archive/ndic/dmas/Michigan_DMA-2011%28U%29.pdf
[16] http://www.micrstats.state.mi.us/CJIC/ucrstats/CountyArrestsT.asp
[17] https://www.accesskent.com/Health/ME/pdf/2013_ME_Annual_Report.pdf

MET was originally organized into two units, a Suburban Unit to investigate and target street and mid-level narcotics dealers, and a Conspiracy Unit to investigate and target upper level narcotics traffickers.[18] As its primary focus, MET has been guided by the MSP Strategic Drug Plan[19], and currently focuses on heroin, prescription opiates, cocaine, and methamphetamine. MET has also worked closely with federal agencies on narcotic crimes with regard to federal statutes.

In 2004, the role of the Suburban Unit changed into one of criminal interdiction.[20] Since then, the Interdiction Team has utilized historical data to drive investigations and decisions, with the ultimate goal of identifying and interdicting couriers with narcotics and currency. This has included working with the United States Postal Service, Fed Ex, UPS, and also commercial transportation nodes such as bus, plane and train. The team has also identified drug and money couriers at local hotels.

The role of the Conspiracy Unit (now the Street Team) currently focuses on mid- and upper-level narcotic dealers. The team's ultimate goal is to identify and dismantle drug trafficking organizations (DTOs) comprised of five or more suspects.

MET officers initially relied on informal and confidential information, but later found the analysis of collected data important, and used specific practices and partners to identify interventions that matched the nature of drug trafficking so as to disrupt organizations and to stop drug flows. HIDTA provides analytical support to the MET such as the recognition of investigative conflicts (different agencies investigating the same suspects) and case matching (accrual of information on the same suspects). MET also uses both HIDTA and the Michigan Information Operations Center (MIOC) for database checks and financial reports to aide in their investigations. Analysts are also utilized to capture cell phone numbers and phone data in overdose cases to help identify dealers. Informant information is also now vetted, detailed, and summarized through the MIOC, where it is organized and accessible to the MET.

Summary

The case study of the Kent County MET indicated that its transition to relying on SP principles of data-driven processes and partnerships preceded the SPI. Having said this, MSP's SPI supported these efforts in several respects. As noted earlier, MSP has placed an emphasis on harm reduction (targeting harmful substances and larger seizures) and metrics linked to harm reduction targets. Additionally, the further development of the MIOC as a resource supporting the MET and similar task forces provides human resources (analysts) and timely information to support planning and investigations.

Secure Cities - Flint DDACTS[21]

[18] http://www.narcoticnews.com/investigations/task-forces/michigan/met-metropolitan-enforcement-team/

[19] http://www.michigan.gov/documents/msp/SPPhaseIIBooklet_474342_7.pdf

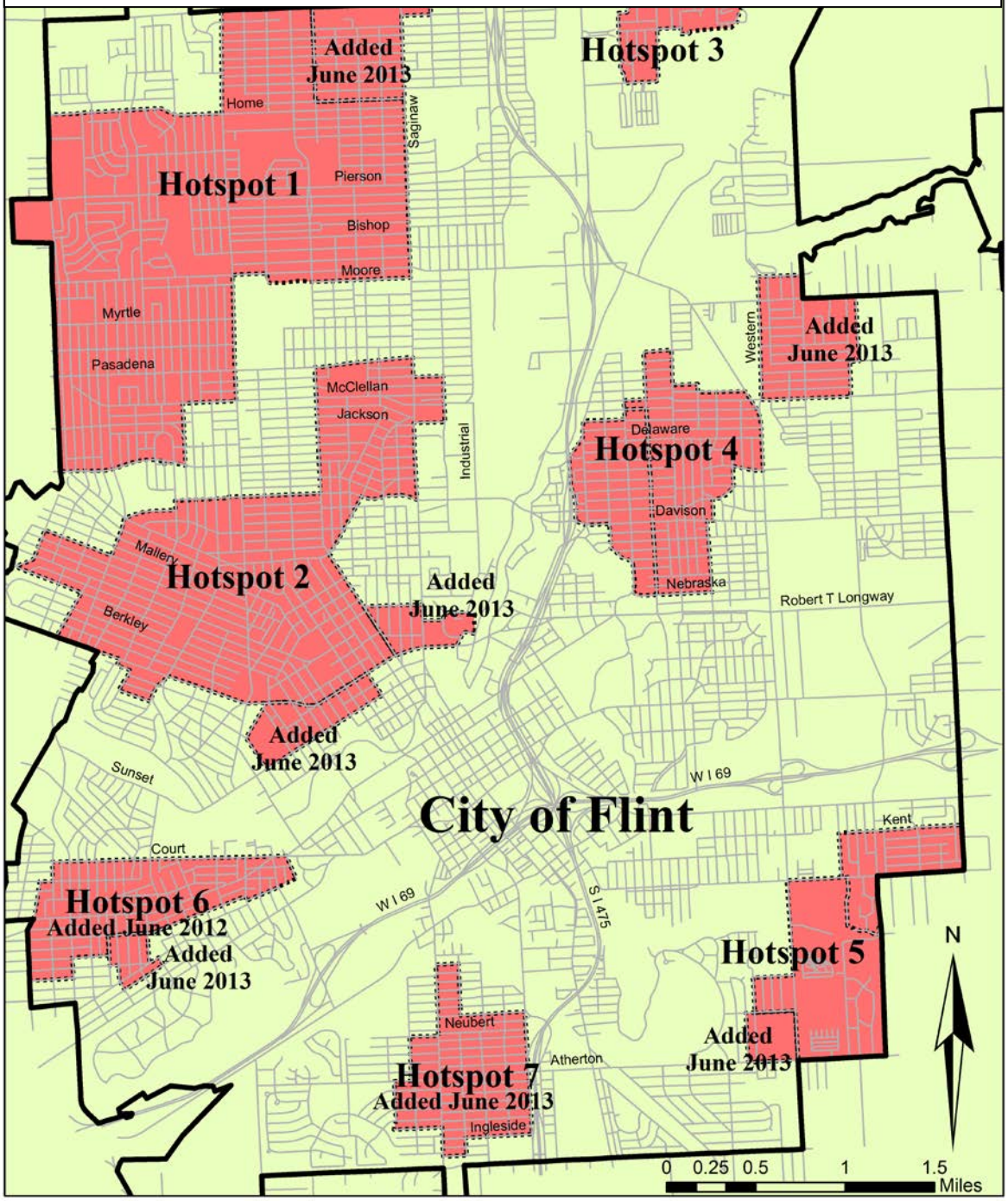
[20] https://www.michigan.gov/documents/417527MetropolitanEnforcementTeam_118352_7.pdf

[21] Greater detail on the DDACTS evaluation is available in Rydberg, McGarrell and Norris, 2014; and McGarrell, Rydberg, and Norris, 2014.

As described above, the SCP involved MSP providing support to local law enforcement in Michigan cities that had experienced high rates of violent crime in an era of tight local budgets that have created resource constraints on local law enforcement. The SCP initially focused on Detroit, Flint, Pontiac and Saginaw and recently expanded to six additional cities. In providing this support, MSP was also committed to following data-driven processes and EBP. The initial strategy followed the DDACTS model, a promising practice developed in several other jurisdictions. Given the high rates of violent crime in the SCP, the primary goal was to utilize DDACTS in high violent crime areas.

Flint was the first city in which MSP deployed DDACTS in 2012. MSP provided training in DDACTS and MSP analysts prepared hot spot maps and related analyses of violent crime patterns. These analyses resulted in the identification of five violent crime hot spot areas with two additional areas identified in 2013 (e.g., see Figure 4). In reality, these areas were larger than a hotspot but represented areas within the city experiencing high levels of violent crime. More detailed maps provided by MSP allowed post commanders and personnel to identify hotspots within these high crime areas.

Figure 4. Flint DDACTS Hotspots as of June 2013



The DDACTS strategy involved additional directed patrols in the hotspot zones. Consistent with data-driven principles, MSP gathered extensive data from the troopers deployed in the DDACTS initiative. From January 2012 through March of 2014, over 22,000 traffic stops occurred. The most common outcome of the traffic stop was a verbal warning. This was intended to send a message of increased police presence in high violent crime areas but in a fashion that would not harm police-community relations (e.g., such as might be produced by high levels of citations). There were over 21,000 verbal warnings but also considerable enforcement actions as DDACTS resulted in over 3,300 felony and misdemeanor arrests and just fewer than 4,000 fugitive arrests.

Table 1 DDACTS Enforcement Activity Outputs by Hotspot and Time Period, January 2012 through March 2014

Location Output	Jan – Jun 2012	Jul – Dec 2012	Jan – Jun 2013	Jul – Dec 2013	Jan – Mar 2014	**Total**
Non-Target Areas						
Verbal Warnings	143	912	924	2,310	1,150	**5,439**
Hazardous Citations	2	46	38	100	30	**216**
Fel & Misd Arrests	27	148	184	424	140	**923**
Fugitive Arrests	28	201	201	441	203	**1,074**
Overall Hotspots						
Verbal Warnings	815	3,412	4,068	5,610	1,941	**15,846**
Hazardous Citations	41	103	126	130	44	**444**
Fel & Misd Arrests	149	485	448	1,073	235	**2,390**
Fugitive Arrests	164	675	728	1,026	313	**2,906**
Entire City Totals						
Verbal Warnings	958	4,324	4,992	7,920	3,091	**21,285**
Hazardous Citations	43	149	164	230	74	**660**
Fel & Misd Arrests	176	633	632	1,497	375	**3,313**
Fugitive Arrests	192	876	929	1,467	516	**3,980**

The outcome assessment suggested significant reductions in violent crime following the implementation of DDACTS. Total violent crime as well as homicide, assault, and robbery declined 19 percent. Robberies declined 30 percent. Declines were also evident in other parts of Flint, though in most cases the size of the reduction was more modest. The evaluation report indicated that the trends were very positive, though it was difficult to draw strong conclusions since the reductions occurred in other parts of the city as well as the target zones. This suggested the possibility of either the diffusion of benefits from DDACTS or another factor affecting violent crime in both the target and comparison areas (Rydberg, McGarrell and Norris, 2014).

Table 2 Changes in Monthly Violent Crime Rates per 1,000 residents, Pre- and Post-DDACTS Implementation

	All Violent Crimes[†]			Homicide, Assault, Robbery		
	Pre	Post	% Chg	Pre	Post	% Chg
DDACTS Hotspots	2.74	2.21	-19.34	2.39	1.92	-19.67
Comparison Areas	1.64	1.52	-7.32	1.42	1.31	-7.75

	Homicides			Aggravated Assaults		
	Pre	Post	% Chg	Pre	Post	% Chg
DDACTS Hotspots	0.06	0.05	-16.67	1.58	1.34	-15.19
Comparison Areas	0.03	0.03	±0.00	0.90	0.81	-10.00

	Robberies			Criminal Sexual Conduct		
	Pre	Post	% Chg	Pre	Post	% Chg
DDACTS Hotspots	0.76	0.53	-30.26	0.09	0.10	+11.11
Comparison Areas	0.48	0.47	-2.08	0.08	0.09	+12.50

	Weapons Offenses		
	Pre	Post	% Chg
DDACTS Hotspots	0.20	0.19	-5.00
Comparison Areas	0.13	0.11	-15.38

Note: % Chg = Percent Change; [†] The combination of homicides, aggravated assaults, robberies, criminal sexual conduct, and weapons offenses.

Summary

The DDACTS case study revealed evidence of SP principles in practice. The secure cities were chosen due to their high rates of violent crime. The target areas within the city were those geographic areas experiencing the highest levels of violent crime. The intervention selected, DDACTS, was a promising strategy developed by NHTSA , NIJ, and BJA and that had generated positive findings in other jurisdictions. It was also a strategy with applicability to a statewide law enforcement agency. Detailed performance measures were tracked and MSP made a commitment to evaluate the impact of the DDACTS initiative through its relationship with the research partner (Michigan Justice Statistics Center).

Lessons Learned, Implications, Research Limitations

MSP's SPI provided a mechanism for moving the organization toward a SP framework emphasizing data-driven processes, EBP, strategic planning, performance metrics, technology, and partnerships. MSP's leadership team had already committed to adopting these principles and the SPI grant provided resources, technical assistance, and a focus to accomplish a variety of action steps critical to the organizational change process.

The results of the SPI-related research partner activities indicate that a great deal of activities occurred during the SPI program and that clear evidence exists of organizational change. Among these identifiable actions was the clear articulation of a strategic plan consistent with SP principles. Communication of the commitment to these principles by the Director and Executive Council was evident through briefings occurring throughout all divisions and across the state. This commitment was reinforced by new requirements such as the regular development of planning documents requiring data-based analyses, identification of performance metrics, and continual assessment. Also evident was a commitment to training in the SP model as well as the skills needed to successfully operate in the SP environment. Finally, the organization has changed through a commitment to technology. The technology "pushes" information throughout the organization that supports both data-driven management and tools for conducting problem analyses and tracking progress toward goals. These represent major accomplishments in a four-year period.

Interviews, observation of organizational processes, and the case studies also provided evidence of organizational change at multiple levels and across multiple divisions of the organization. These changes were most evident at command and managerial levels. This makes sense as initial training occurred at these levels and accountability mechanisms (e.g., requirement for data-driven strategic plans and performance metrics) were most apparent at managerial levels. There was also evidence at the line level, at least in terms of troopers recognizing the emphasis that MSP leaders were placing on data-driven processes, EBP, and metrics.

Thus, there is evidence that MSP is not the same organization as it was at the outset of the SPI grant. Observation of this change process also yields implications.

- Organizational change is difficult and requires comprehensive approaches including leadership commitment and clear articulation of mission, vision, and goals. As one MSP official stated, the "visible support and communication of the Director's 100 percent commitment to the data-driven model was critical."
- Training is essential. This was most apparent in the finding that staff who had engaged in prior SP training were most familiar with SP principles and most likely to engage in SP practices.
- Incorporating SP into all training programs, ranging from recruit training at the academy, through first-level supervision and staff and command, to specialized training specific to the Dashboard and strategies such as DDACTS, is a foundation of broad organizational change.
- Leadership commitment and training are critical but will have the greatest impact if reinforced by resources that make it possible to move to the SP model. In the case of

MSP this involved a major commitment to data-sharing and analysis as provided by the Dashboard and MIOC.

- The organizational change process is ongoing. Continued attention to integrating SP principles and practices will be essential for continual organizational transformation.

Additionally, several lessons were learned through this process. One area was the continued evolution of the Dashboard. First, considering the relative infancy of the system, training is still required. This training places an additional burden on officer time, which may already be strained with normal workloads. Second, troopers are hampered in their use of the Dashboard for two primary reasons: time constraints and a lack of perceived utility of strategic crime and crash overviews from officers. The introduction of more tactical tabs, like the warrants tab, was a valuable step in providing tactical information of clear value to the troopers. MSP command level officials viewed the continual refinement of information pushed out to various divisions and personnel as an ongoing and critical process.

Finally, there were limitations in the research that have implications for future research of relevance to MSP's organizational change process. First, there are limitations that are the product of timing. As noted throughout the report, there was considerable evidence of organizational change. This was most apparent at executive and supervisory levels of MSP. Representatives at these levels continually reinforced the use of data, metrics, and EBP in strategic planning and accountability processes. Clear examples were evident throughout interviews and observations. These were also the levels within the organization that initially received training in these principles and where work processes were altered to require the use of data and metrics. In contrast, the major training for line level personnel just occurred in the final quarter of 2015. Although baseline measures have been developed through the original employee survey and the survey completed as part of the recent training, there has not been adequate post-training time to accurately assess the impact of training and day-to-day supervision and operations on trooper and other line-level perceptions and behavior.

Prior organizational and policing research suggests the importance of extending the current study to focus on change at the line level of MSP (Lipsky, 1980; Maguire, 1997). Organizational change tends to occur more readily at the upper levels of organizations and often reflects what researchers refer to as the "institutional" level, or "public face", of the organization (Meyer and Rowan, 1977). More challenging is change at the "technical" core involving line level employees such as troopers who have traditionally provided highway patrol and reactive responses to calls for service.

The current research documents the efforts to change the technical core (e.g., changes in the academy curriculum and pedagogy; fall 2015 training on EBP and the Dashboard; use of data by superiors in trooper deployment) but is limited in being able to carefully document change at the line level. Repeating a similar survey at a future period with participants in the training would yield a much more meaningful picture of the impact of the training and associated experience. Additionally, as either a complement or alternative to an organizational survey, development of an assessment system to provide MSP with ongoing information about the application of SP and EBP could support MSP's efforts to institutionalize the SP model.

Similar comments are relevant for the assessment of use of the Dashboard technology. As time passes since the training occurred, it would be very informative to conduct an assessment of Dashboard use. In addition to providing a measure of Dashboard use, such research activity could also identify additional data needs or adaptations to the Dashboard from a customer perspective. The finding that MSP managers of the Dashboard already solicit user feedback again suggests the commitment to technology and data accessibility.

Along these lines, an impressive finding in the current research was the discovery of signs of change in multiple divisions of MSP. Clear evidence of change was observed among the executive command staff, at the Forensic Science Division, Computer Crimes Unit, training academy, and field posts. The current study was limited, however, in systematically measuring organizational change in all divisions and units of MSP. Future research would benefit by identifying a representative sample of divisions and units and use a common methodology to assess change. This would provide useful information to MSP leadership to identify variation across the organization in the application of data-driven processes, EBP, and metrics. Such findings could suggest training and processes to further advance SP throughout MSP.

Conclusion

In 2011 the Michigan State Police embarked on a major organizational change effort to shift organizational philosophy and practice to principles consistent with SP. Specifically, MSP sought to implement data-driven processes, evidence based practice, strategic planning, and metrics in all areas of the organization. The current study suggests substantial organizational change, consistent with this newly defined strategic plan, has occurred. This conclusion is offered with recognition that organizational change is an ongoing process. Should the next few years include the same commitment to leadership, training, leveraging of technology and data, and accountability, as was apparent in the study period, it seems very likely that the principles of SP will be even further ingrained in mission, daily operations, and metrics throughout all levels and functional divisions of the organization.

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Appendix A

Department-Wide Survey Regarding the Use of Evidence Based Policing[22]

During summer 2012, the RP-I research team conducted a department-wide survey of all sworn and civilian employees of the Michigan State Police (MSP). This survey was intended to gauge the extent to which evidence based policing practices were being used by MSP employees in the early stages of the SPI. The survey provided an assessment of the current stage of data-driven processes and EBP and served as a baseline for the department during its transition.

The Sample

A total of 855 sworn, civilian, current, and recently retired Michigan State Police employees completed the survey. Of the sample, 76.6% were sworn officers, and 86.7% were active employees. The remaining respondents were civilian and retired employees, respectively. The largest group of respondents were troopers (48.2%), just under one-third were sergeants (30.9%), and the remaining ranked as lieutenants or higher (20.9%). The average tenure at MSP for a sworn employee was 17.8 years, and the average tenure for a civilian employee was 12 years. The majority of sworn officers were assigned to road patrol (40.7%), special assignments or task forces (21.3%), or administrative functions (12.8%). The majority of civilian employees were assigned to administrative (34.4%) or forensic (22.2%) tasks. Responses for all retired employees were removed from the findings.

Findings

The survey first sought to develop a baseline for employee training in community policing, crime analysis, problem-oriented policing, and evidence-based-policing. The survey asked respondents, specific to the time period one year prior to the survey: "Did you receive training in the following topics through MSP, conferences, classes, or other opportunities"? Table A1 shows the sample's responses. On the whole, sworn officers were more likely to report training in these four areas when compared to civilian employees. This is likely the result of a large number of civilian employees, more than one-third, serving administrative tasks within the department, and thus not requiring training in these four areas to complete their day-to-day tasks.

[22] Survey and data analysis conducted by Dr. Tia Stevens under the direction of RP-I principal investigators, Drs. Chermak, Morash and Wilson.

Table A1

Type of Training	All	Sworn	Civilian
Community Policing	35.0%	42.8%	12.6%
Crime Analysis	26.1	30.1	15.2
Problem-Oriented	25.3	29.9	12.6
Evidence-Based	18.9	20.8	13.6

Second, those in the sample were asked to respond to a series of evidence-based policing activities. Specifically respondents were asked how often they used basic "what works" research in decision making, how often they used data to identify problems, how often they put data into strategic action, how often they coordinate with other agencies, how often they conduct outcomes research to measure the success of organizational practices, and how often they use research to improve the department as an organization. Responses were recorded on a five-item scale: Never, a Few Times, Monthly, Weekly, Daily. These five responses were treated as numerical ordinal values ranging from never (1) to daily (5) for the purposes of between group comparison within the sample. Table A2 shows the average response for several key groups, broken down by employment status (sworn or civilian) and officer rank. Overall, the practice of coordination with other agencies was reported as most frequent, for the sample averaging as slightly higher than "a few times" in the past year. Sworn officers reported more frequent use of these six practices when compared to civilian employees. This might also be a result of a large number of civilian employees assigned to administrative tasks. Consistent for all practices, higher ranking officers were more likely to report more frequent usage of data-driven decision making than troopers and sergeants. Overall, the department generally did not use engage in these activities, particularly those involving the use of data, on average reporting somewhere between "never" and "a few times" within the past year.

Table A2

Activity	All	Sworn	Civilian	Trooper	Sergeants	Lts +
Coordination	2.08	2.26	1.61	2.06	2.26	2.74
Strategic Action	1.86	2.05	1.34	1.73	2.18	2.67
Identify Problems	1.72	1.82	1.45	1.69	1.77	2.25
What Works	1.66	1.77	1.34	1.64	1.74	2.15
Organization	1.55	1.58	1.47	1.22	1.55	2.47
Outcomes	1.49	1.52	1.41	1.25	1.49	2.19

Another way to evaluate the use of evidence based policing practices by the sample is to examine the number of employees who reported that they "never" engage in any of the six practice types. Table A3 shows the distribution of sworn and civilian employees who reported that they "never" engaged in the listed practices in the year prior to the survey. Approximately seventy percent of all civilian employees reported having "never" used each of the six evidence-based practices. Significant differences were found among practices for sworn officers however. Almost three in four sworn officers reported engaging in collaborative efforts with other agencies at least once in the year prior to the survey (i.e. 72.8% responded in a way other than "never"). This was the behavior sworn officers most frequently reported having engaged in at least once. The two behaviors sworn officers most frequently reported having "never" engaged in were outcomes based research (65.6%) and research to improve the department (61.1%).

Table A3

Percent of Respondents Reporting Having "Never" Engaged in the Practice in the Year Prior to the Survey		
Activity	**Sworn**	**Civilian**
Outcomes	65.6%	72.2%
Organization	61.1	67.2
Identify Problems	47.8	69.7
What Works	44.5	73.7
Strategic Actions	36.7	75.8
Coordination	27.2	67.7

Table A4 shows the distribution of responses regarding frequency of use of evidence based practices for sworn officers who had and had not received training in the for specified areas. For every form of training, and for every activity, those who received training reported more frequent use of evidence-based practices.

Table A4

	Evidence-Based		Crime Analysis		Problem-Oriented		Community Policing	
Activity	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**
What Works	2.09	1.69	2.01	1.67	2.07	1.65	1.92	1.67
Identify Problems	2.13	1.73	2.02	1.73	2.06	1.72	1.90	1.76
Strategic Actions	2.44	1.95	2.22	1.98	2.35	1.92	2.14	1.98
Coordination	2.51	2.19	2.48	2.16	2.53	2.14	2.34	2.19
Outcomes	1.91	1.42	1.60	1.48	1.81	1.39	1.63	1.44
Organization	2.12	1.44	1.77	1.50	1.96	1.42	1.74	1.46

The survey asked respondents to report, on the same five point Likert scale, how frequently they used a list of data sources. Sworn officers reported more frequent use of all data sources. Use of internal data sources (AICS, MSP's criminal database; criminal activity reports; and MIOC, Michigan's fusion center, intelligence reports) were the most frequently used sources. All other forms of data were used, on average, less than "a Few Times" in the year prior to the survey, with Higher Ranking employees' use of data from other departments, information from experts, and Michigan's Incident Based Reporting (MICR) System the lone exceptions. Table A5 shows the average reported use of each data set.

Table A5

Source	All	Sworn	Civilians	Troopers	Sergeants	Lieutenants +
AICS	3.63	4.17	2.17	4.69	3.96	3.42
Activity Reports	2.66	3.01	1.69	3.50	2.55	2.52
MIOC Intel	2.29	2.52	1.67	2.28	2.61	3.01
Data from other LE	2.22	2.33	1.92	2.04	1.98	2.41
Experts	1.76	1.90	1.38	1.80	1.87	2.19
MICR	1.75	1.87	1.43	1.96	1.65	2.01
Crash Data	1.68	1.71	1.60	1.79	1.56	1.71
Internet	1.63	1.69	1.45	1.71	1.59	1.81
What Works lit.	1.60	1.67	1.39	1.59	1.62	1.99
Best Practice MSP	1.58	1.70	1.25	1.60	1.66	2.03
CAD	1.51	1.55	1.40	1.70	1.36	1.55
Best Practice gen.	1.51	1.62	1.22	1.50	1.62	1.94
DDACTS	1.18	1.14	1.29	1.09	1.06	1.37