

PUTTING POLICE IN THE BOX:
THE EFFECTIVENESS OF DATA-DRIVEN LAW ENFORCEMENT

By Kurt D. Zempel

This field project conducts a program evaluation of the Sheboygan Police Department's implementation of the Data-Driven Approaches to Crime *and* Traffic Safety (DDACTS) grant. The federally-funded DDACTS program engages analysis of crime and traffic data to identify "hot spot" areas with the highest occurrence of crime and traffic problems, which in turn drives the deployment of police resources in those areas for the greatest effect in improving the community's quality of life and reducing the social harm caused by criminal activity and traffic crashes. It funds additional saturation patrols to conduct high-visibility traffic enforcement to address both crime and traffic safety problems.

The evaluation is an assessment of merit and worth, employing descriptive and causal inquiry methods to measure the outputs of additional police activity as well as program outcomes by comparing the effect of the grant-funded activity on reducing the occurrence of crashes and crimes. The evaluation also assesses the program's effectiveness on improving overall quality of life and reducing the fear of crime and perception of disorder for Sheboygan's residents by conducting a survey of the community's response to police enforcement activity in response to crime and traffic problems, voluntary compliance with traffic laws, and feelings of safety. It also evaluates the lasting effect of the program on the internal police culture through interviews with selected police administrators to determine whether it has brought about a broader use of data as a fundamental factor in the deployment of police resources.

The evaluation concludes that the Sheboygan Police Department's experience with the DDACTS program has coincided with significant reductions in overall reported crimes and traffic crashes, particularly the opportunistic crimes of theft and burglary, where a specific deterrent effect was found for these crimes during months of DDACTS program activities. However, while the community survey indicates general public satisfaction with the department's tactics and evidence of program effect on the action outcome of safer driving behavior, the public's perception of crime and traffic safety conditions has not improved. The program is also found to have helped demonstrate the effectiveness of data-driven deployment and hotspot policing at the Sheboygan Police Department, where the program's tactics have become an every-day part of the department's patrol strategy.

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Introduction

This field project conducts a program evaluation of the Data-Driven Approaches to Crime and Traffic Safety (DDACTS) grant as implemented by Sheboygan Police Department from 2009 through 2012. The DDACTS program engages analysis of crime and traffic data to identify “hot spot” areas with the highest occurrence of crime and traffic problems, which in turn drives the deployment of police resources in those areas for the greatest effect in improving the community’s quality of life and reducing the social harm caused by criminal activity and traffic crashes. It identifies high-visibility traffic enforcement as a proven countermeasure to address both crime and traffic safety problems. The DDACTS grant was used by the Sheboygan Police Department to fund additional saturation patrols of targeted high-crime, high-crash areas to conduct aggressive traffic enforcement, increasing the public perception of police presence and risk of apprehension as well as the likelihood of police/offender contact, resulting in an overall and residual deterrent effect on opportunistic crime and aggressive driving behavior.

The evaluation is an assessment of merit and worth, and uses three methods to answer the question, “Does the program work?” First, it employs descriptive inquiry to measure the outputs of additional police activity generated by the program, such as police contacts with traffic violators, citations and warnings

issued, and associated criminal arrests. It also provides for measurement of program outputs by comparing the effect of the grant-funded activity on reducing the occurrence of traffic crashes and opportunistic crimes as compared to prior years through both descriptive and causal analysis methods. Through these modes of inquiry, the evaluation determines whether the program is meeting its stated goals of a 20% reduction in both personal injury crashes and crashes overall, a 15% reduction in opportunistic crime, and increased preventive enforcement of associated violations such as OWI, aggressive driving behaviors, curfew and underage drinking violations.

The evaluation also employs a community survey to assess the program's effectiveness on improving overall quality of life and reducing the fear of crime and perception of disorder for Sheboygan's residents, the community's engagement and participation in the program, effectiveness of community outreach, media and education components, perception of police enforcement activity in response to crime and traffic problems, and voluntary compliance with traffic laws.

Finally, the researcher conducted interviews with program administrators, both at the Sheboygan Police Department and other test-site agencies, to compare the results of the Sheboygan Police Department's experience with those of other adopting agencies. The interviews also gauge whether the agencies' experience with the DDACTS program has fostered a wider adoption of data-driven policing within their jurisdictions and whether they have applied the model to deployment of police resources department-wide.

Program Background

Agency Context

The Sheboygan Police Department serves the City of Sheboygan, a community of approximately 50,000 residents on the western shore of Lake Michigan. It has 85 sworn law enforcement officers, including patrol officers, detectives, school resource officers, drug unit and street crimes unit investigators, and supervisors. The department employs approximately 30 non-sworn support staff and dispatchers, and has an annual budget of approximately \$11 million. In 2011, the Sheboygan Police Department responded to 29,648 calls for service, including the investigation of 1,589 Part I crimes as defined by the FBI's Uniform Crime Reporting requirements. The department also investigated 1,555 traffic crashes in 2011, including 1 fatal and 176 personal injury crashes (Sheboygan Police Department, 2011).

In achieving its vision to have Sheboygan be the safest community of its size in America, the department established the following mission statement:

OUR MISSION is to be the model of excellence in policing by working in partnership with the community and others to:

FIGHT crime, the fear of crime and disorder;

ENFORCE laws while safeguarding the constitutional rights of all people;

PROVIDE quality service to all our residents and visitors; and

***CREATE** a work environment in which we recruit, train and develop an exceptional team of employees (Sheboygan Police Department, 2011).*

The CompStat Model

In response to a growing perception and fear of the occurrence of crime in the community, in 2011 the department instituted a new neighborhood policing model for its patrol division. The city was subdivided into neighborhood-sized units, each of which was assigned a primary neighborhood officer responsible for the department's overall response to crime and quality-of-life issues in the specific geographic area. With the transition to an updated computer-aided dispatch and records management system, the department also began using crime mapping to identify problem areas and drive its deployment of resources and problem-solving techniques to specific high-crime and high-crash areas.

This method of geographic accountability for crime and quality-of-life problems is also known as CompStat. First conceived and put into practice by former New York Police Commissioner William Bratton in 1994, CompStat has become widespread practice in police agencies nationwide and has been described as "perhaps the single most important organizational/ administrative innovation in policing during the latter half of the twentieth century." (Willis, Mastrofski, & Weisburd, 2003) A 2003 report by the Police Foundation identified the following six core elements of the CompStat model of policing:

- Mission clarification
- Internal accountability
- Geographic organization of operational command
- Organizational flexibility
- Data-driven analysis of problems and assessment of department's problem-solving efforts
- Innovative problem-solving tactics (Willis, Mastrofski, & Weisburd, 2003)

The DDACTS Program

As part of implementing the CompStat model and building on its improved data analysis capabilities, the Sheboygan Police Department applied for and won the Data-Driven Approaches to Crime *and* Traffic Safety (DDACTS) grant in 2009, and the grant was renewed for a total of three years of grant activity, with the subsequent grants being awarded in October of 2010 and 2011.

First introduced in July of 2008 by the US Department of Transportation's National Highway and Traffic Safety Administration (NHTSA), DDACTS was developed in cooperation between the US Departments of Transportation and Justice as an operational model for police agencies to address increasing and competing demands for services. The program's authors recognized that police

departments must make decisions regarding the prioritization of police responses to crime, traffic and quality of life concerns in their communities with limited resources, and that the competition between increased demand, diminished resources and increased operating costs was curtailing departments' traffic enforcement and crime prevention activities. The DDACTS philosophy places renewed emphasis on traffic enforcement as an effective strategy for reducing the occurrence not just of traffic crashes and violations, but also of crime problems and the perception of crime (Burch & Geraci, 2009).

The DDACTS operational model is a problem-oriented approach which recognizes that place-based policing provides a more efficient, stable, and ethically-sound strategy for targeting crime problems, as compared to the more traditional approach of person-based policing. It encourages the use of high-visibility traffic enforcement in targeted areas as an effective strategy to control both traffic and crime problems – particularly opportunistic crime such as robbery, theft or residential and commercial burglary. Where criminal activity typically gets the majority of the attention from police departments at the expense of traffic safety problems, DDACTS proposes that traffic enforcement is the way to resolve both problems (Burch & Geraci, 2009).

Through saturation of identified locations of high-crime and high-crash occurrences with aggressive traffic enforcement, the DDACTS approach engages the deterrent effect of increased police visibility in the community as well as the commonsense assumption that much criminal activity involves the use of a motor

vehicle. The authors of the program also point to more than 20 years of research which supports the lasting benefits of strategically targeted traffic enforcement.

The following advantages have been identified by the research:

- High-visibility traffic enforcement is effective at disrupting organized crime, particularly illegal drug and firearm operations, and is most effective when targeted to high-crime areas.
- Traffic enforcement increases law enforcement visibility in the community, which heightens the perceived risk of apprehension. However, the increase in enforcement activity must be substantially higher than normal daily police contacts.
- General criminal deterrence and residual benefits are best achieved by significantly increasing enforcement activity for a short time and then returning to a normal level.
- Traffic stops are an effective interdiction strategy to combat drug, gun and other crimes (National Highway Traffic Safety Administration, 2009).

Agencies employing the DDACTS model are provided seven guiding principles based on established best practices for successful community-oriented law enforcement programs:

- **Partners and Stakeholder Participation:** Encouraging involvement of community partners in crime prevention strategies is essential in reducing the social harm and improving quality of life for the community.

- **Data Collection:** Determining location, time of day, day of week, and categorization of current crime and traffic incidents provides the foundation for effective deployment of police resources. Other non-traditional data may also be included, such as location of supervised offenders, common dangerous driving behaviors, and citizen complaints.
- **Data Analysis:** “Hotspot” identification through integrating crime, crash and traffic data onto comprehensive maps, considering causation, spatial and temporal factors.
- **Strategic Operations:** Making operational assignments based on the analysis of hotspots focuses law enforcement efforts in problem areas and increases efficiency.
- **Information Sharing and Outreach:** Agencies are encouraged to share accomplishments and promote community involvement through reports to media, administrators and elected officials.
- **Monitoring, Evaluation, and Adjustments:** Ongoing monitoring and adjustment of field and internal operations is based on data analysis, and allows assessment of reductions in crimes and crashes, cost savings, etc.
- **Outcomes:** Goals and objectives identified through analysis of problem areas and causation factors can be used to assess effectiveness of specific intervention and deployment techniques (National Highway Traffic Safety Administration, 2009).

Local Goals and Implementation

In its 2011 grant application, the Sheboygan Police Department echoed the overall goals of the program to address crime and traffic safety in specifically identified zones within the city that experienced disproportionate numbers of criminal events and traffic safety issues. Using the grant funding, the department was able to deploy additional patrol officers into the identified areas during timeframes in which the data analysis indicated the highest criminal activity and traffic problems were occurring. By saturating these areas with high-visibility traffic enforcement, the probability of police contact with criminal offenders is increased, and street-level opportunistic crime is deterred. The application also spelled out the following specific, quantifiable measures of success:

- 20% reduction in personal injury crashes within the identified DDACTS sectors as compared to the same timeframe of the previous year
- 20% reduction in overall crash rate of the DDACTS areas, as compared to the previous year
- 15% reduction in opportunistic crime, particularly robbery, burglary, theft and damage to property
- Increased enforcement of peripheral violations that aid in prevention, such as OWI, moving traffic violations, curfew violations and underage drinking (Sheboygan Police Department DDACTS Grant Application, June 2011).

To accomplish the greatest impact and residual deterrent effect in targeted areas, five DDACTS “sectors” were initially identified throughout the city in 2009. The sectors were later replaced by targeted neighborhoods after the department implemented its new patrol initiative in 2011, which included identifying 75 neighborhood units within the city. Deployments were broken down into four-hour blocks of two or three officers at a time, who were directed to coordinate their high-visibility traffic enforcement activity to flood a specific area for short periods, then cycle through the other hot spots at random. The deployments were also scheduled for identified times of high traffic volume and corresponding increases in traffic crashes and aggressive driving behavior, as well as during times of the highest probability of opportunistic crime. For the 2011 grant alone, a total of 61 four-hour deployments were planned from November 2011 through September 2012, resulting in an additional 644 hours of police patrol. The department was awarded \$35,000 to cover the wage costs only of these additional patrols, which were worked by officers as overtime assignments. The grant also required a 25% local funding match, for a total program funding of \$43,750. The grant did not take into consideration additional administrative, equipment, fuel and vehicle maintenance costs which resulted from the additional patrol activity (Sheboygan Police Department DDACTS Grant Application, June 2011).

Evaluation Methodology

The DDACTS model's last two guiding principles – monitoring, evaluation and adjustments and outcomes – highlight the importance of a thorough and ongoing assessment of the program's success. The application for Wisconsin agencies to receive the grant also requires the identification of specific objectives that are “quantifiable and time-framed” (Sheboygan Police Department DDACTS Grant Application, June 2011). Mark, Henry and Julnes identify “situations in which there is a strong interest in comparing net effects” as having an assessment of merit and worth as the priority (Mark, Henry, & Julnes, 2000). The goals outlined in the Sheboygan Police Department's grant application provide the most obvious foundation for an assessment of the program's success and raise the following questions: Is the program accomplishing these goals? Are overall reductions in both crashes and opportunistic crime occurring? Are the targeted percentages being achieved? Is enforcement of associated violations increasing? This evaluation includes a review of the impact of the DDACTS program on rates of reported crimes and crashes as well as additional police enforcement activities to answer these questions.

Although these would be adequate indicators of the program's success in and of itself, this assessment of merit and worth is also extended to consider the program's value in accomplishing the overall departmental mission of improving the public's perception of crime and traffic safety overall. Thus, the evaluation

includes a community survey to assess the program's impact on the following outcomes: Is the program having a deterrent effect on aggressive driving behavior? Is the public supportive of the increased police response to high-crime and high-crash areas? Do community members have an improved perception of overall public safety? Are educational and media outreach efforts changing behavior such as safer driving habits and crime prevention efforts?

Finally, the DDACTS program was intended as a demonstration of the effectiveness of using data to make deployment decisions, and to encourage sustained adoption of the DDACTS principles department-wide even after the grant-funded activity ends. By providing departments an opportunity to experiment with data-driven deployments, the program should lead to changes in departmental culture so that the DDACTS practices become an integral part of each agency's response to future crime and traffic safety problems. To assess the program's effectiveness at accomplishing this culture change, this evaluation includes interviews with program administrators both at the Sheboygan Police Department and at several of the DDACTS test sites to determine whether their experience with the program was a success – not only from the perspective of its impact on crime and crash statistics for their jurisdiction, but also from the standpoint of affecting internal organizational functioning and practices.

Logic Model

For the purposes of this evaluation, the following outcomes model (Figure 1) was constructed to help visualize the functioning of the DDACTS program as conceived and implemented at the Sheboygan Police Department. It takes into consideration both local and general situational factors, particularly the department's recently improved capacity for and focus on data analysis to direct the department's response to community problems. Although increased equipment, fuel and vehicle maintenance costs as well as additional administrative costs are a natural result of the additional enforcement activity funded by the grant and could be included as obvious inputs, these factors were not considered as part of the logic model in order to simplify the evaluation. Also, crime prevention, media outreach and public education efforts are included as inputs and activities of the program even though the grant does not specifically fund these activities, either. However, they are part of the department's overall crime prevention and public safety strategy and can have a significant impact on the outcomes of the DDACTS program. Finally, the outcomes listed incorporate the program's impact internally on the department through increased knowledge sharing, training and cooperation between the traffic and criminal enforcement functions of the department.

Sheboygan Police Department DDACTS Outcomes Model

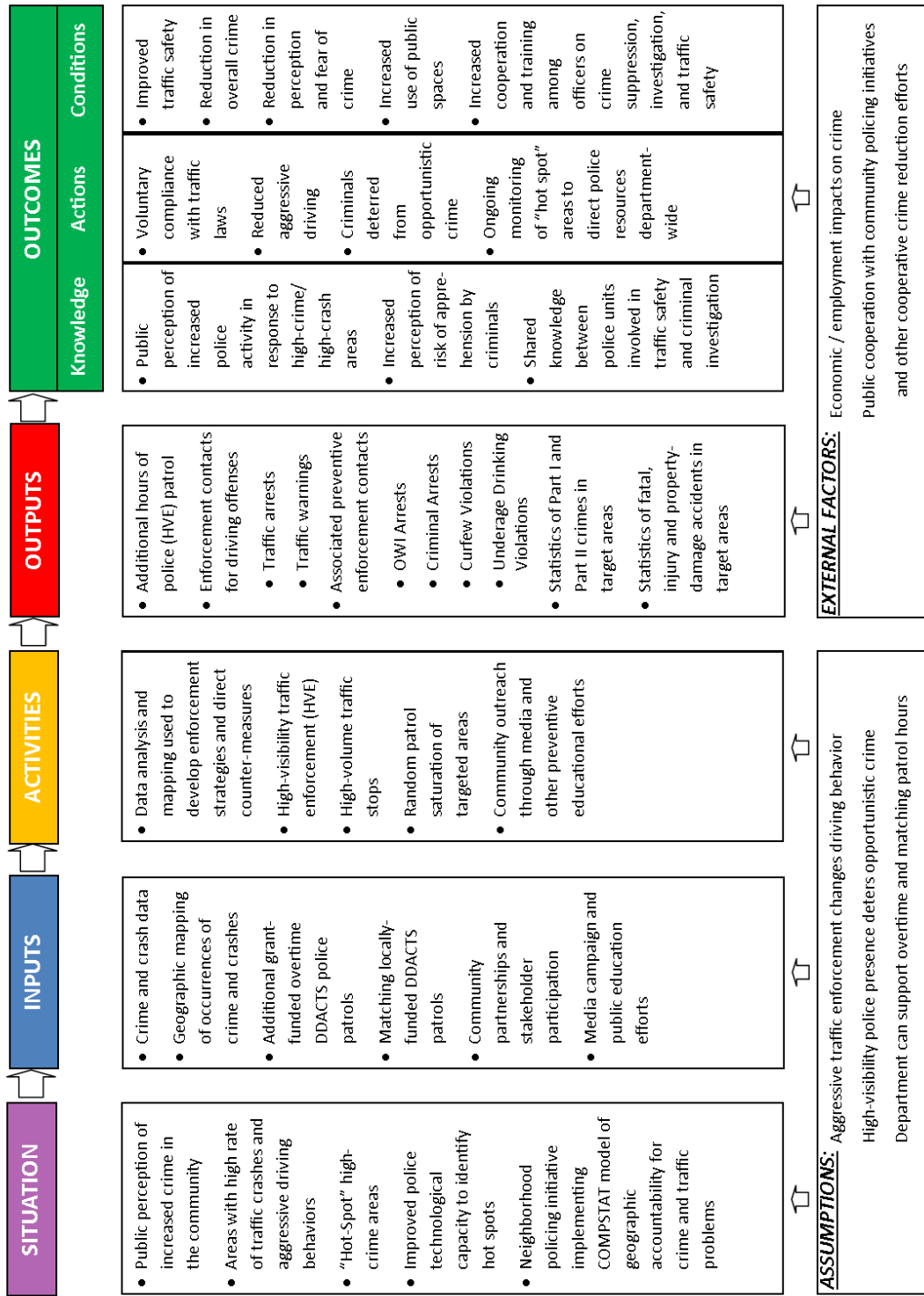


FIGURE 1. Sheboygan Police Department DDACTS Outcome Model

Inquiry Modes

In the evaluation of the program's overall success in accomplishing the three main objectives identified above – namely, 1) its actual impact on additional police enforcement activity and rates of reported crime and crashes, 2) its effectiveness at improving public perceptions regarding community safety, and 3) its sustainability as a method of directing police resources agency-wide through adoption of the DDACTS principles – the evaluation engages the following inquiry modes.

For the purpose of assessing merit and worth, values inquiry is typically the first mode to establish appropriate outcomes by which the program's success can be measured. However, where values are already well established through the natural course of societal preferences or previous program development processes, it is not necessary to conduct values inquiry as the primary mode in the evaluation (Mark, Henry, & Julnes, 2000). The DDACTS program as implemented by the Sheboygan Police Department is one of these instances. Communities naturally value improved public safety through reductions in criminal violations and traffic crashes. Therefore, it is not necessary to conduct an initial values inquiry, since obvious outcome measures are already identified through normal societal preferences.

Evaluation of output goals.

Since the causes of both crimes and traffic crashes involve complex behavioral, economic, engineering and other societal variables, pure causal analysis can be limited as an inquiry mode when determining the specific effects of different

law enforcement interventions such as the DDACTS program (Mark, Henry, & Julnes, 2000). Determining correlation between the program's activities and changes in crime and traffic crash rates is likely sufficient to assess the program's impact and success.

This evaluation includes trend analysis of rates of crimes based on the Sheboygan Police Department's monthly FBI Uniform Crime Report (UCR) data as well as monthly rates of reported traffic crashes reaching back more than two years prior to program implementation. The following archival data has been obtained from the Sheboygan Police Department's records management system to make descriptive comparisons to assess the program's success in achieving output goals:

- Number of enforcement contacts by officers assigned to DDACTS high-visibility enforcement (Traffic citations, traffic warnings, etc.)
- Number of Uniform Crime Report Part I crimes (Homicide, forcible rape, robbery, assault, burglary, theft, motor vehicle theft, and arson)
- Number of identified street-level opportunistic crimes (Robbery, burglary, theft)
- Number of motor vehicle crashes (fatality, injury, and property-damage)

Because of the specificity of the data collected above, including time of occurrence and location, descriptive comparisons on the above data can be made both by time-based relationships and spatial relationships. Comparisons between data from different time periods show the program's impact not only on overall crime and traffic safety trends, but also the concurrent and residual deterrent effect

during and after the specific periods of program activity. The following temporal comparisons are included in the evaluation:

- Overall yearly and monthly Part I crime statistics to identify community-wide and long-term crime trends
- Yearly and monthly reports of identified opportunistic crimes (Robbery, burglary, theft)
- Overall yearly and monthly reports of motor vehicle crashes and alcohol-related crashes reported to the state
- Occurrence of crashes and crimes reported during specific months of high-visibility enforcement, compared with months and years prior to program activity

Evaluation of outcomes.

The above output measures would only tell half of the program's success story, however. Moving beyond analysis of statistical changes in enforcement activity or crime and crash rates to assessment of the identified outcomes allows for a reasonable determination of the program's overall impact on the community's actual and perceived safety. Referring to the outcomes model in Figure 1, the identified program outcomes of public perception of police response, perceived risk of apprehension, voluntary changes in driving behavior, improved perception of public safety, and even use of public spaces are evaluated by conducting a community survey.

Although the City of Sheboygan in the past has conducted surveys for budget prioritization purposes and neighborhood demographic surveys as part of current Neighborhood Revitalization Strategy Area (NRSA) efforts through federal community block grants, specific surveys regarding residents' perception of crime and public safety or attitudes toward traffic laws and problems have not been previously undertaken. The absence of baseline survey data does not eliminate the possibility of assessing changes in behavior. Questions which require the respondent to assess their own changes in attitude and which establish baseline attitudes, such as always driving safely regardless of the perception of police response, can show a correlation between perception and program activities. Statements can also be designed to gauge community members' awareness of and response to public education and media efforts that are part of the department's DDACTS program activities.

A 19-question community survey was employed specifically to assess the outcomes of the DDACTS program's activity. Survey questions were constructed to elicit the respondent's change in attitudes and perceptions for the following outcomes, employing a Likert scale (*strongly agree* to *strongly disagree*) to quantify survey responses. The entire survey instrument is included as Appendix A.

- Knowledge Outcomes:
 - Public perception of increased police activity in response to high-crime/high-crash areas
 - Increased perception of risk of apprehension by criminals

- Action Outcomes:
 - Voluntary compliance with traffic laws
 - Reduced aggressive driving
 - Criminals deterred from opportunistic crime
- Condition Outcomes:
 - Improved perception of traffic safety
 - Reduction in perception and fear of crime
 - Increased use of public spaces

The outcome goals for the DDACTS program are not only intended to impact the community at large, however. Providing grants to local police agencies to experiment with the DDACTS model was intended to act as a catalyst for department-wide adoption of the data-driven approach beyond the life of the grant. By providing departments extra resources to demonstrate the effectiveness of hotspot analysis and high-visibility enforcement techniques, the program's advocates expected police administrators and supervisors to continue applying these principles when making deployment decisions for any of their resources, rather than reserving these tactics only for the extra patrols funded by the grant.

Email and in-person interviews were conducted with police administrators responsible for implementation of the DDACTS program both at the Sheboygan Police Department as well as other test sites and agencies who were grant recipients, both within Wisconsin and nationwide. The interview participants were asked to evaluate, based on their own experience with the DDACTS model, the

outcome goals of increased cooperation and sharing of information between divisions with different responsibilities as well as whether it resulted in a change in police culture and response to crime and traffic safety problems or wider adoption of the program's techniques. The interview questionnaire used for all of the interviews is included as Appendix B.

Results

Outputs

First is the analysis of the program's success through comparisons of the statistical measures that quantify the program's output goals. Although the DDACTS grant was first awarded to the Sheboygan Police Department in November 2009, the available reports of grant-funded patrols show that extra patrol activity was targeted in the first year of the program to the busier summer months, which historically experience higher rates of crashes and reported crimes. For the remainder of the program years through September of 2012, the only months in which no grant-funded activity was reported were October 2010, November 2010, and October 2011. Each month's activity report included number of deployments, total hours of deployments, and total contacts including a break-down of citations and warnings across several specific types of traffic violations. Although these included a specific report of arrests made for Operating While Intoxicated (OWI) by officers engaged in grant-funded activity, none of the other traffic categories were found to be a useful indicator of enforcement of aggressive driving behaviors.

Increased Enforcement Activity.

For the first three output goals of additional hours of police patrol engaged in high-visibility enforcement and additional contacts and arrests, the reports show that the grant resulted in an additional 1,783.25 hours of police patrol in the targeted hot spot areas across 469 officer deployments, or an average of

approximately 81 hours of additional police patrol per month. These patrols generated a total of 1,993 additional contacts with the public through stops of motor vehicles for traffic violations or contacts with people for field interviews. Officers wrote citations for a total of 1,074 traffic violations, including 54 arrests for OWI. These result in an average of more than 76 additional contacts, 41 traffic citations, and 2 OWI arrests per month for the life of the program.

A common-sense approach to evaluating the program based on its accomplishment of these outputs would ideally include comparing department-wide rates of traffic contacts and arrests between periods with grant-funded patrols and those without. However, the manner in which officer-initiated contacts were coded and reported across the life of the program, as well as the department's transition in May of 2010 to a new records management system with different coding and reporting procedures, made consistent comparisons impractical for the purposes of this evaluation. These circumstances also prevented analysis of the program's effect on associated preventive contacts, such as curfew, OWI, and other violations.

However, it is reasonable to assume that the additional contacts and arrests reported would not have occurred without the additional hours of officer presence in the hotspot areas, since the officers conducting the patrols would not have been there otherwise. The Sheboygan Police Department DDACTS program administrator, Captain Steve Cobb, agrees that because officers assigned to the overtime patrols were reserved for the hotspot patrol activity and the grant program required a certain number of contacts per hour of funded activity, the

contact and arrest statistics reported are indeed additional contacts that would not have otherwise occurred (Personal communication, April 8, 2013).

Crime and Crash Statistics.

The evaluation of the rates of reported crimes and traffic crashes are perhaps the most valuable indicator of the effects of the program. For the purposes of this evaluation, the outputs of reported FBI Uniform Crime Report (UCR) Part I crimes (homicide, forcible rape, robbery, aggravated assault, burglary, theft, motor vehicle theft and arson) as well as reportable accidents under the State of Wisconsin criteria (any fatal, injury, or property damage accidents where the total value of damaged property is greater than \$1,000) were selected to compare program effects on these measures. These statistics were selected because of the consistency of reporting, since in both categories, the department is responsible for submitting regular

Table 1: Sheboygan Police Department Part I Crimes

Year	Violent Crime				Property Crime				Total	% Change
	Murder	Forcible Rape	Robbery	Agg. Assault	Burglary	Theft	Motor Vehicle Theft	Arson		
2006	1	29	11	38	320	1,973	88	18	2,478	
2007	1	21	29	40	430	1,979	62	13	2,575	4%
2008	-	10	27	43	349	1,772	67	10	2,278	-13%
2009	2	18	28	51	312	1,539	49	7	2,006	-14%
2010	1	20	22	69	216	1,234	44	3	1,609	-25%
2011	1	16	24	84	222	1,196	43	3	1,589	-1%
2012	3	20	21	127	260	1,204	42	5	1,682	6%

reports to either state or federal agencies, but also because they include measures of social harms that the DDACTS program is designed to counteract.

Table 1 shows the annual reports of UCR Part I crimes as reported to the FBI by the Sheboygan Police Department. As the annual rates show, although Sheboygan was already experiencing a downward trend in the included crimes, the largest drop in crime coincided with the first year of DDACTS program activity – a 25% drop from 2009 to 2010. Thereafter, crime reports stabilized at a rate approximately 20% lower than the last year before program activity, 2009. Table 2 shows annual rates of all reported motor vehicle crashes for the City of Sheboygan. Although the largest reported drop in crashes occurred between 2008 and 2009, crash rates continued to decline until 2012, where they stabilized at a rate approximately 25% lower than the peak year of 2008.

Table 2: Sheboygan Police Department Traffic Crashes

Year	Fatal	Injury	Hit and Run	H&R W/ Injury	PD Only	All Other	Total	% Change
2007	0	200	397	22	1,398	2	2,019	
2008	1	242	405	20	1,436	5	2,109	4%
2009	3	162	381	12	1,234	2	1,794	-18%
2010	1	195	326	22	1,071	28	1,643	-9%
2011	1	176	337	6	1,024	11	1,555	-6%
2012	1	178	318	9	1,062	7	1,560	0%

These results in themselves are a strong indicator of the success of the program, since double-digit drops in crime and crash rates – especially a 25% drop in crime from one year to the next – are remarkable occurrences for any jurisdiction. However, some difficulties in isolating the association between program activity and

reported crime and crash rates present themselves, since the DDACTS program coincided with other departmental activities and influences that would also impact these statistics. For example, the 18% drop in reported crashes from 2008 to 2009 could possibly be attributed to the department participating in two similar federally-funded grant programs which supported additional speed and seatbelt enforcement and OWI patrols starting in 2009. These programs used the same method of high-visibility traffic enforcement to impact driver behavior, and – under the same theory DDACTS adopts to explain its effectiveness in combating both crime and crash problems – may have contributed to the earlier reductions in Part I Crime reports as well.

In order to further isolate the connection between program activity and the output measures of crime and crash reports, monthly figures of UCR Part I Crimes and monthly crash numbers were obtained, along with the required monthly reports of additional patrol hours, contacts and citations generated by the DDACTS program patrols. Reviewing graphs of the reported crime numbers shows positive results during the life of the program. Figure 2 shows that although there are seasonal undulations in overall reported Part I crimes, the typical seasonal spikes were significantly reduced during the life of the DDACTS program. Additionally, a rolling nine-month average of the Part I crime statistics shows an average that hovers near 200 reported crimes a month prior to the program's start, but which then drops to around 150 during the program's extra patrol activity. In Figure 3,

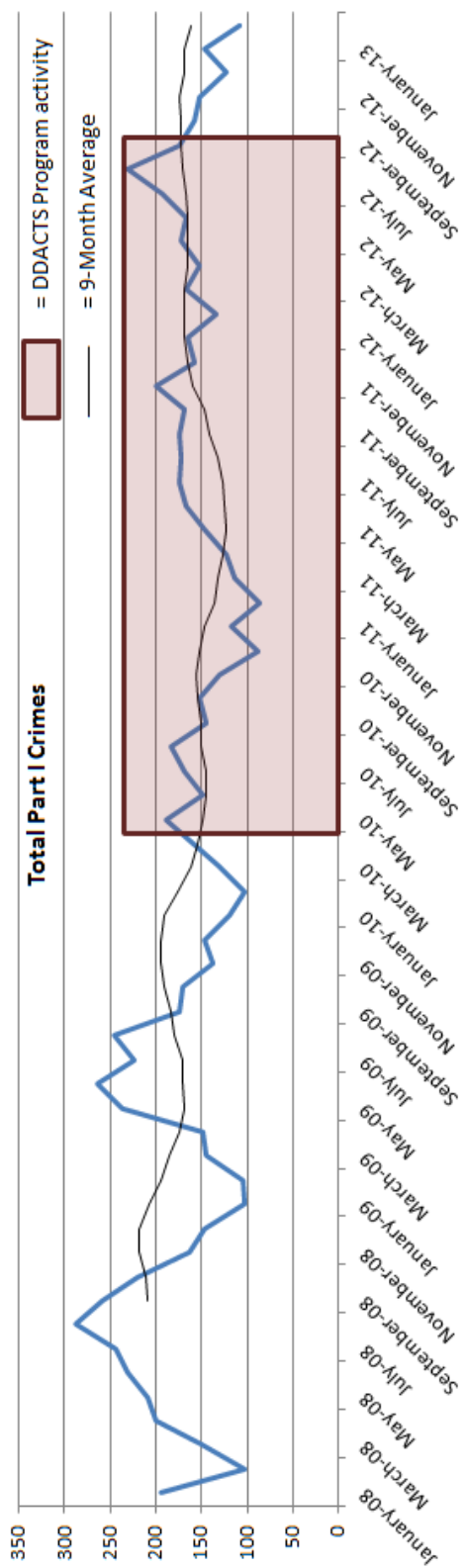


FIGURE 2. Total Part I Crimes

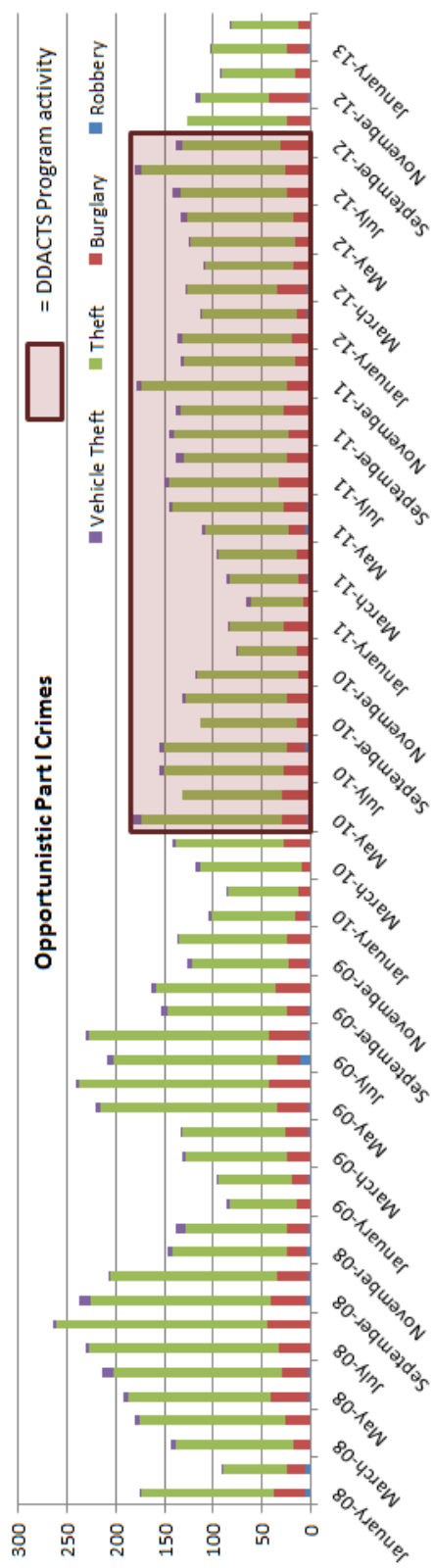


FIGURE 3. Opportunistic Part I Crimes

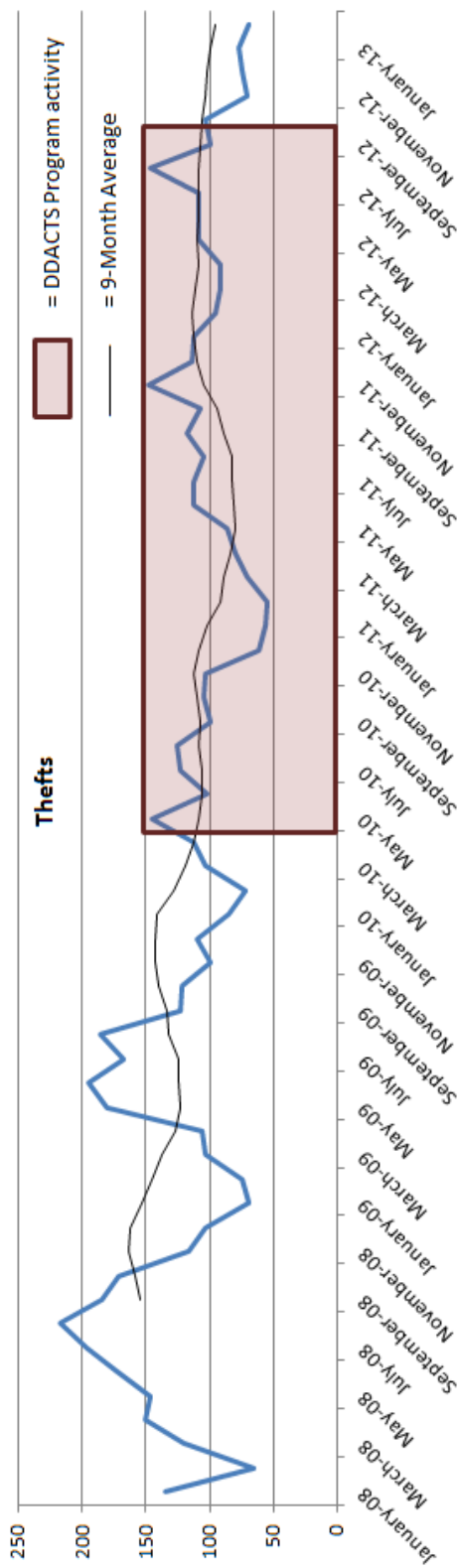


FIGURE 4. Thefts

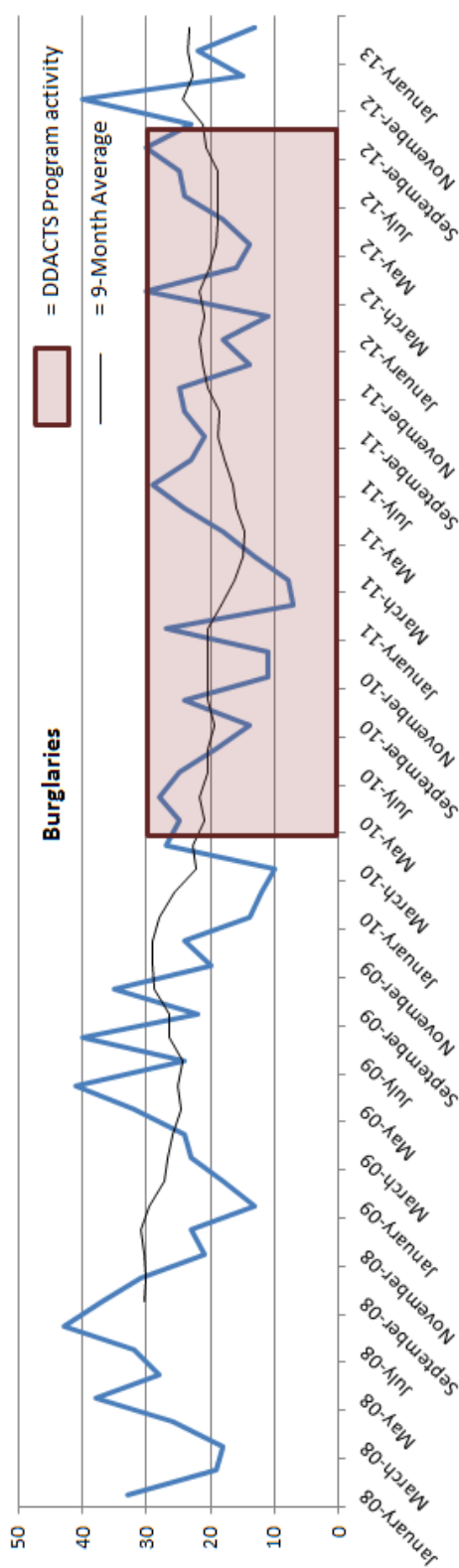


FIGURE 5. Burglaries

further isolating the “opportunistic crimes” included in the Part I reported numbers – vehicle theft, theft, burglary and robbery – shows a similar smoothing of the seasonal spikes in these crimes during the DDACTS patrols.

Thefts are the most prevalent Part I crime, followed by burglaries as a distant second. These two crimes together are the biggest drivers of changes in Part I crime statistics, and are displayed individually in figures 4 and 5. These crimes are also impacted by typical seasonal fluctuations, with the seasonal spikes appearing to be significantly attenuated during the DDACTS program. The rolling nine-month average again provides an opportunity to control for the seasonal variance, and shows the monthly average of reported thefts to fluctuate around 140 prior to program activity, then drop to around 100 during the program. Although burglaries occur less frequently and are therefore subject to more monthly volatility, the nine-month average again shows a significant change during the program compared to beforehand averages. Interestingly, in the month immediately after the program concluded, November 2012, Sheboygan experienced a spike in burglary activity to a level not experienced in over three years and counter to typical seasonal trends.

Analysis of monthly reported motor vehicle crashes shows a similar effect during the period of DDACTS patrols. For the monthly comparisons, only crashes which were reportable to the state under Wisconsin criteria (crashes resulting in injury or more than \$1,000 damage) were used due to availability of monthly data. Although the state-reported crash numbers include data as far back as 2005, the

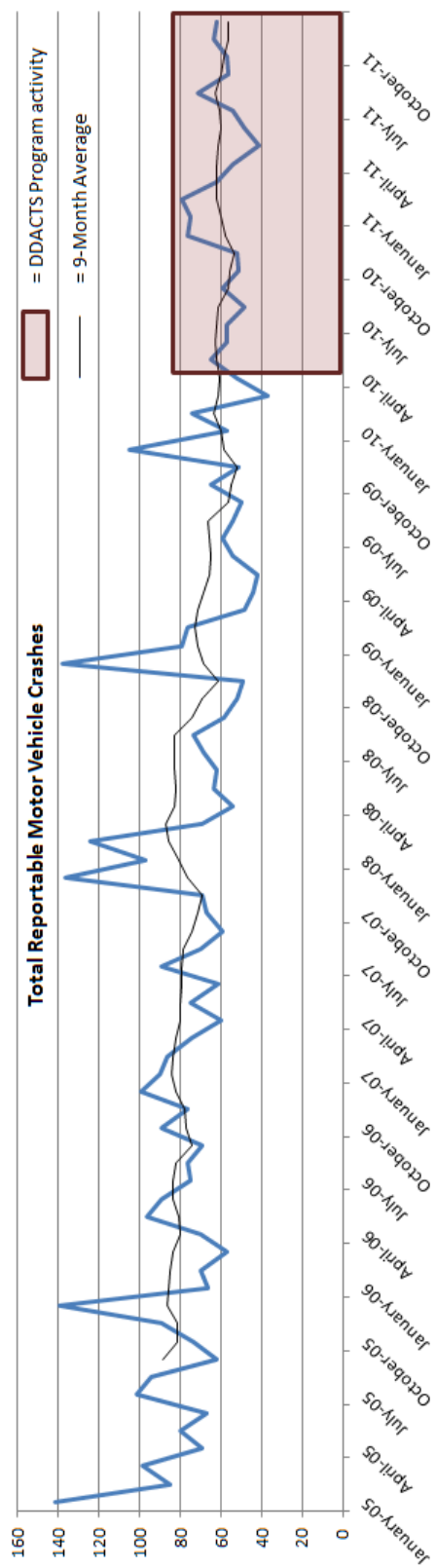


FIGURE 6. Total Reportable Motor Vehicle Crashes

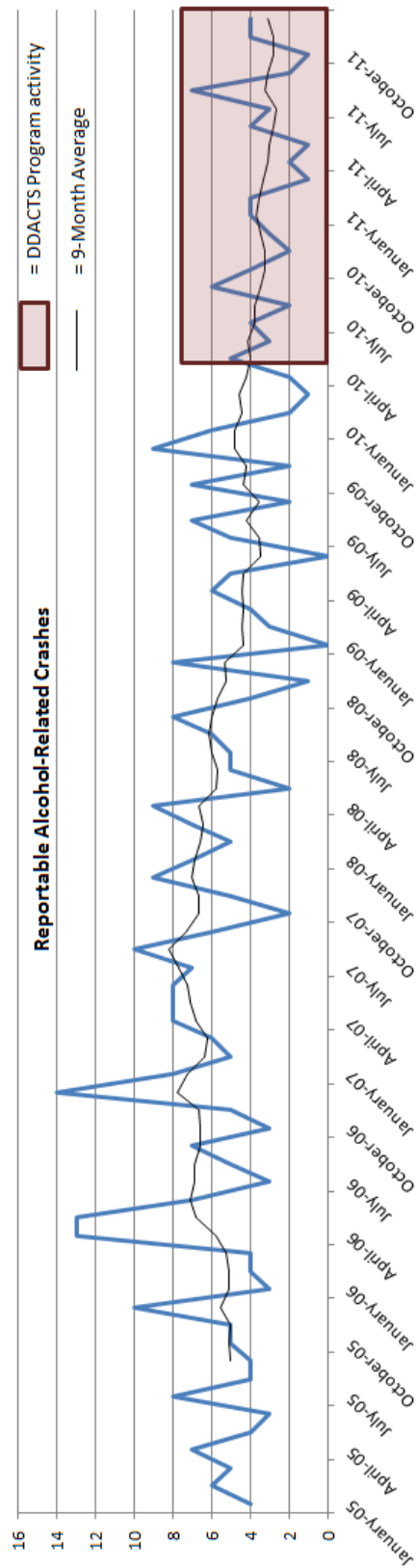


FIGURE 7. Reportable Alcohol-Related Crashes

official numbers for 2012 are not yet available so only a portion of the program activity period is captured in this data. Total monthly reportable motor vehicle crashes and reportable alcohol-related crashes are charted in Figure 6 and Figure 7 respectively, with the period of program activity again highlighted in red.

Both figures again include a rolling nine-month average of reported crashes to allow for smoothing of seasonal fluctuations. The seasonal impact on crash statistics is generally opposite that of its effect on crime statistics due to more weather-related crashes in the winter months. The monthly reportable crash statistics also show the downward trend that was already apparent in the annual numbers reported above, but there still is an observable reduction in the highlighted months that include DDACTS patrol activity. Some of the reduction in crash reports in the months prior to the start of the DDACTS program may again indicate the effectiveness of the two other grant-funded patrol programs the Sheboygan Police Department began earlier in 2009 on reducing traffic crashes by targeting OWI, speed and seatbelt enforcement. It is again noteworthy that these programs also used high-visibility traffic enforcement as a means to change driver behavior and take advantage of the deterrent effect of such activity. Although this makes specific isolation of the DDACTS program's effects difficult, it is however consistent with and supportive of the DDACTS theory.

Outcomes

Referring to the structure for this evaluation provided by the logic model in Figure 1, two different types of program outcomes were identified: those which were intended to impact the public or community at large and those which would impact the police agency involved in the DDACTS program. The community survey conducted for this evaluation was designed to assess public perception of the program's impact on the knowledge, action and condition outcomes identified in the logic model. Interviews with police administrators responsible for their agency's participation in the DDACTS program were used to assess its impact on the internal agency outcomes.

Community Survey.

The community survey was mailed to 1,000 households in the City of Sheboygan. Addresses were obtained from the City of Sheboygan Planning Department's master list of 18,515 tax parcels. This list was filtered to include only residential property types – single-, two- and multi-family parcels, resulting in just over 14,000 residential properties. This list was further randomized by sorting by street address and selecting every 14th address to obtain the sample of 1,000 city residents. Responses were received from 202 recipients, resulting in a sampling error of +/-6.9% at the 95% confidence level. Only three responses included missing data, all of which omitted a response for the demographic question of marital status only.

Table 3: Community Survey Results

Question	Percent of Respondents Who:					Mean	Std. Deviation
	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree		
I have noticed an increase in police enforcement activity and visibility across the entire city compared to previous years	14.4	24.8	41.1	10.9	8.9	2.75	1.110
I have noticed an increase in police enforcement activity and visibility in specific neighborhoods and at specific intersections compared to previous years	19.8	24.3	38.1	12.9	5.0	2.59	1.095
I am satisfied with our police department's response to areas of crime and traffic problems	22.3	32.7	25.7	15.3	4.0	2.46	1.116
If I commit a crime or traffic violation, I know I'll get caught by the police	20.3	27.2	33.7	13.9	5.0	2.56	1.110
I am more likely to get pulled over if I commit a traffic violation now than in the past	14.4	16.3	48.0	15.8	5.4	2.82	1.042
I slow down and drive more carefully when I am travelling through an area where I have seen police pull over lots of cars	27.7	25.2	33.7	9.4	4.0	2.37	1.104
I have noticed fewer aggressive drivers this year compared to last year	3.5	8.9	34.7	25.2	27.7	3.65	1.084
I drive more safely now than last year because I am more likely to be stopped by police	5.9	11.4	55.0	13.4	14.4	3.19	1.014
Increased police activity and visibility in the city has helped reduce the opportunity for criminals to commit new crimes	8.9	22.3	40.1	18.8	9.9	2.99	1.081
I have noticed fewer crashes in the city over the past year than in previous years	3.5	10.9	64.9	17.8	3.0	3.06	.737
I feel safer when traveling in a vehicle in the City of Sheboygan than I did in previous years	3.0	13.4	57.4	18.3	7.9	3.15	.857
I have noticed that other drivers are driving more safely this year because police are cracking down on traffic violations	3.0	10.4	44.6	23.8	18.3	3.44	1.002
I am less likely to become a victim of crime in my neighborhood than last year	5.9	9.9	46.0	21.8	16.3	3.33	1.052
I feel more comfortable walking in my neighborhood or using city parks than last year	2.0	12.9	43.1	24.3	17.8	3.43	.991

The survey included 14 questions employing a Likert Scale, with available responses ranging from 1="Strongly Agree" to 5="Strongly Disagree". The first five questions were designed to assess the community knowledge outcomes identified in the logic model, with the next four measuring action outcomes and the remaining five assessing condition outcomes. Five demographic questions were also included for comparison to census data to ensure representativeness of the sample. 56.4% of survey respondents were female, 94.1% were white, and 57.4% were married. This indicates an oversampling of female, white and married residents, since the 2010 survey showed the City of Sheboygan to be 50.5% female, 84.9% white and 43.4% married (US Census Bureau, 2010). Of survey respondents, 78.7% indicated they had lived in Sheboygan for 20 years or more, with only 5.4% living in Sheboygan less than five years.

Frequencies and means for the survey questions are listed in Table 3. The survey questions were structured to encourage respondents to consider their own change in perception of crime and safety compared to previous years. This allows for an assessment of the impact of the DDACTS program activity on the knowledge, action and condition outcomes identified in the logic model even though baseline survey data was not collected prior to program implementation.

The first five questions addressed the first two knowledge outcomes of increased police activity and increased risk of apprehension by asking whether respondents have noticed increased police activity, are satisfied with the Sheboygan Police Department's response to problem areas, and whether they now experience

and increased fear of apprehension. Most notable among these questions is that 55% of respondents agree or strongly agree that they are satisfied with the police department's response to areas of crime and traffic problems, against just 19.3% who disagree or strongly disagree. This is certainly good news for the department and indicates strong public support for its efforts in targeting specific high crime and crash areas. Furthermore, about twice as many respondents indicated they noticed an increase in police activity – both across the entire city and in specific neighborhoods or at specific intersections – than those that disagreed with these statements. Although a large portion (47.5%) of respondents expressed fear of apprehension if they committed a crime or traffic violation, only 30.7% agreed that they were more likely to be apprehended now than in the past.

The next four questions assessed the action outcomes of voluntary compliance with traffic laws, reduced aggressive driving, and increased deterrence of opportunistic crimes. The response of 53% of survey respondents indicating they slow down and are more cautious in areas they have noticed increased police activity supports the DDACTS program's tenet that high-visibility enforcement can have an impact on driver behavior. Only 17.3% of respondents agreed that they drive more safely now because of an increased likelihood of being stopped by police. However, several returned surveys included handwritten responses to this question that this was not a good reason, or not the reason for the respondent's driving behavior. Thus, the large number of respondents who indicated no change in their driving behavior due to an increased fear of apprehension could indicate that most

survey respondents are safe drivers regardless of their perception of police activity. This could also indicate that the 17.3% of respondents who now drive more safely were indeed positively impacted by program activity, since they likely would have reported no change in their driving behavior had they not perceived an increased fear of being stopped for traffic violations.

Only 12.4% of respondents agreed or strongly agreed that they have noticed a decrease in aggressive driving behavior, while 53% disagreed (27% responded with strong disagreement). This indicates that although respondents report changes in their own driving behavior – again, driving more safely in areas of high enforcement activity (53%) or due to increased fear of apprehension (17%) – they do not recognize the same change in behavior in other drivers. Finally, for the action outcome regarding deterrence of opportunistic crime, survey respondents were split on whether the increase in police activity and visibility has had an impact. More than 31% agreed that criminal opportunity has been reduced by police activities, while 28.7% disagreed.

The remaining five questions asked the respondents about their feelings of safety and behavior in response to crime and traffic conditions. Despite the fact that reported numbers of traffic crashes have declined considerably in recent years, strong majorities of respondents indicated that they have not noticed this change. Nearly 65% responded with “Neither Agree nor Disagree” when asked if they have noticed fewer crashes, with just 14.4% agreeing. Similarly, 57.4% expressed no opinion regarding an increased feeling of safety while traveling in a vehicle in the

City of Sheboygan, while 26.2% disagreed, indicating they did not feel safer. Only 13.4% felt that the driving behavior of others had improved because of police “cracking down” on traffic violations, while 42.1% disagreed (18.3% indicated strong disagreement). Finally, a very small number of respondents reported reduced fear of crime and increased use of public spaces in their neighborhoods. Just 15.8% felt less likely to become a crime victim against 38.1% who disagreed, and a mere 14.9% agreed that they were more comfortable walking in their neighborhood or using city parks, while 42.1% disagreed. These results point to a disconnect between community perceptions of crime and traffic safety and the real occurrence of reported crimes and crashes, which will be discussed further in the next section.

Police Administrator Interviews.

The remaining outcomes identified in the logic model regarding the internal impact of the DDACTS program at the Sheboygan Police Department on knowledge sharing, ongoing use of the program’s tactics, and cooperation among various functional units of the agency were evaluated in an email interview with Captain Steve Cobb, the Sheboygan Police Department’s patrol division commander (Personal communication, April 8, 2013). Cobb wrote the department’s application for the DDACTS grant through the Wisconsin Department of Transportation’s Bureau of Transportation Safety and oversaw the grant project through all three years of the program. Email questionnaires were also received from four other

agencies who participated in the DDACTS program to compare the Sheboygan Police Department's experience with that of other agencies.

Cobb describes the department's experience with the DDACTS program as very positive. He believes the overall reductions in crime and crash statistics for the entire city are a result of a "diffusion of benefit" from the program's activities in targeted hotspot areas, and that feedback he has received anecdotally from community members indicates that the program did result in favorable responses. Although no formal study was conducted on the deterrent effect of the DDACTS program, he said informal contacts with residents of the targeted areas indicated that increased police presence did have a deterrent effect and that the residents were grateful for the department's response. He also believed the program had some impact on the department's relationship with community groups and the public, helping to build public confidence in the department's efforts to target problem areas with extra enforcement activity. Despite the positive impact on crash and crime rates and the apparent deterrent effect, Cobb expressed concern about the ability of the department to sustain these benefits in the absence of the additional grant-funded patrols, which ended in November 2012, and that the program's benefits may be waning.

Cobb reports that the program's techniques of hotspot and place-based policing have become a major part of the department's patrol deployment strategy, and that the DDACTS program has provided the opportunity for managers to develop crime analysis skills and learn how to use this information to make

deployment decisions. The most significant structural impact of the DDACTS program was the decision to change patrol shift start times for a portion of officers each day so the department had manpower on-duty at times of an increased need for police resources. He said this change resulted directly from the analysis conducted in developing the department's DDACTS implementation plan which identified periods of high-volume calls for service. Also, even though dedicated grant-funded patrols have ended, the DDACTS principles have remained ingrained into the daily departmental functioning. Patrol shifts also now set aside a handful of officers for hotspot patrols for at least a portion of their duty time nearly every day.

With regard to the program's goals of improved sharing of information and cooperation between departmental units, Cobb believes there has been some progress toward a more unified system of decision-making department-wide. Although the department's patrol division has experienced significant advances in the ability to conduct and use data analysis, the investigative function of the criminal investigation division has been primarily engaged in offender-based policing rather than focusing on specific locations of criminal activity. However, information developed through investigative efforts is now infused into the hotspot identification process, and the patrol division uses this information to direct hotspot patrols, neighborhood officers, and its own quasi-investigative Street Crimes Unit to address drug and crime problems. Cobb agrees that this is a change in the way such information is shared and used from years prior to the DDACTS program, but best

practices for the management and dissemination of these intelligence streams are still being determined.

In 2010, case studies were conducted on the initial six DDACTS test sites for the National Highway Traffic Safety Administration: St. Albans, VT; Baltimore County, MD; Washoe County, NV; Lafourche Parish, LA; Rochester, NY; and Nashville, TN (Stuster, Worden, McLean & Stuster). These test sites were selected to provide unique contextual factors, such as agency size and type, location and other local characteristics as well as different enforcement methods, frequency, and multi-agency involvement in the chosen implementation of the DDACTS program. However, all six agencies used the program principles of data analysis to deploy additional patrols in targeted hotspot areas, and all reported that the program had a positive impact on overall reductions in reported crime and crash statistics.

Of these six test sites, email interviews were conducted with police administrators and managers involved in the programs at Baltimore County, MD; St. Albans, VT; and Washoe County, NV. The Ashland, WI Police Department was also a recipient of the Wisconsin Department of Transportation's DDACTS grant in 2011 and 2012, and an email interview was included with the program administrator there for an in-state comparison to the Sheboygan Police Department's experience. The results of these interviews are described next.

Baltimore County's experience with DDACTS has been hailed as one of the most successful demonstrations of the program's effectiveness. Their program targeted special enforcement patrols on high-traffic roadways where the

department was also experiencing high rates of armed robberies of retail establishments (Stuster et al., 2010). Howard Hall, then a captain with the Baltimore County Police Department and responsible for the DDACTS program, reports that the department used on-duty resources for increased targeted enforcement in the identified problem areas which resulted in significant increases in police contacts (arrests, citations, and warnings) in the targeted areas (H. Hall, personal communication, March 12, 2013). These efforts resulted in almost immediate and substantial reductions in robberies and other crimes as well as traffic crashes across the county's targeted areas, and that although most crime rates were declining county-wide, the targeted areas generally out-performed the rest of the county.

Aside from the improvement in these public safety measures, Hall indicates that the DDACTS program was aided by strong community support for the department's efforts in targeted areas, including those with significant minority populations, as well as assistance from the state highway safety office which supplemented the department's on-duty efforts with additional grant-funded patrols. The department also appears to have put considerable effort into the community outreach and education principles, including radio and billboard advertising, and even conducted a cooperative engineering review of the targeted roadways to further impact traffic crash reduction (Stuster, et al., 2010). Hall believes the department integrated the consideration of traffic and crime information when making deployment decisions to a much greater degree as a

result of the program. Although the department already used the CompStat approach to identify short-term patterns of criminal activity, he said the DDACTS program provided more of a balance by supplementing this analysis using long-term data.

Vermont State Police Captain Robert Evans was responsible for coordinating the DDACTS program in response to a growing problem of prescription drug abuse in the St. Albans, VT area. The participating agencies recognized this as the root cause of an increase in both criminal activity and traffic crashes, and conducted ten high-visibility enforcement deployments of 20 to 40 officers over a 12-month period. They also directly involved drug investigators and undercover personnel in the planning process, and conducted weekly briefings of drug intelligence, crime and traffic safety information (Stuster, et al., 2010). Evans indicates that the DDACTS program focused on aggressive drug investigation to combat the underlying problem (Personal communication, March 14 2013). Drug intelligence was provided directly to patrol officers and monthly meetings were conducted to share information with all involved local, county, state and federal agencies. Despite some displacement effect, Evans reports sustained improvement in crime and crash problems in the targeted areas. Furthermore, due to the success of the program, the DDACTS approach has been adopted by his entire agency and other involved departments, and that the agency includes DDACTS initiatives as a focus of its weekly command briefings statewide.

Washoe County, NV, also already used the CompStat method for weekly analysis of crime trends, and decided to conduct special DDACTS deployments in the patrol beat area which had the highest rate of UCR Part I crimes and traffic crashes. The department used significantly shorter deployment periods compared to other agencies studied, opting to conduct saturation patrols over two or three targeted weeks rather than year-round. This demonstrated that agencies can still participate in DDACTS initiatives with limited resources by keeping deployments brief but intense. The department experienced reductions in burglary, motor-vehicle thefts, and vandalism – identifying these crimes as the violations most likely to be deterred by high-visibility enforcement – as well as a substantial reduction in injury crashes (Stuster, et al., 2010).

Sergeant Michelle Bello of the Washoe County Sheriff's Office Research and Development unit also reports increased public awareness of the special enforcement activity and improved coordination of information and resources among the involved agencies, including the state highway patrol and local agencies process (Personal communication, April 10, 2013). Although the department recognized an effect on unsafe driving behaviors and criminal activity during the saturation periods, Bello indicates that this effect was not sustained beyond a short time after the deployments ended. Bello also sees the department's participation in the DDACTS program as having educated its managers in data-driven analysis and tactics, and that it has helped improve cooperation with other agencies and the public through regional deployments, information sharing, public service

announcements and other media as well as a community advisory board, and that the department even coordinates its community-oriented policing efforts with the DDACTS.

Greg Bebeau, Chief of Police for the City of Ashland, WI, reports that the DDACTS program was very effective in reducing crashes and crime in 2011, but did not yet have numbers available to determine the program's success in 2012 (Personal communication, March 19, 2013). He indicates that although the general public is very supportive of his department's special enforcement efforts, it does not appear to have had a lasting deterrent effect on driving behavior or opportunistic crimes or brought about increased fear of apprehension. Also, although the department's participation in the DDACTS program did not result in direct strategic or structural changes on departmental functions, the department still engages in data-analysis and hotspot monitoring on an as-needed basis.

Despite substantial differences in the structure, context, specific deployment strategy, and method of agency support, it appears that all of the agencies had a similarly positive experience with the DDACTS program's impact on the occurrence of crime and traffic crashes in the targeted areas based on these interviews and review of the case studies. These experiences also match closely to the results identified in the Sheboygan Police Department's DDACTS program on output goals. However, the interviews highlight differences in the sustainability of these improvements as well as the program's impact on departmental adoption of DDACTS operating principles, which are discussed further in the next section.

Discussion

It is widely recognized that crime and traffic safety problems are a complex mix of causal factors in any community and are impacted by local, statewide and national trends. The community's prior experience and attitudes toward police, cooperation with crime prevention and community outreach initiatives, and local economic and employment factors are just some of the variables present. Although these contextual factors may make an accurate causal analysis difficult, the above comparisons of crime and crash statistics demonstrate that – at a minimum – the Sheboygan Police Department's implementation of the DDACTS program has coincided with substantial improvements in crime and traffic safety for the community.

But are the marked drops in crime and crash reports the result of the DDACTS program activity specifically, or are the department's other crime reduction and community policing efforts that have been undertaken simultaneously more responsible? In order to isolate the DDACTS program effect on crime and crash statistics, the monthly DDACTS activity reports were compared to monthly figures of UCR Part I Crimes and reportable crashes using an independent samples t-test, where each month was grouped by a dichotomous value reflecting whether program activity took place in that month or not. For the overall Part I crime comparisons as well as the specific comparisons to the identified opportunistic crimes, monthly numbers were used from January of 2008 through November of

2012, resulting in comparisons between 33 months with no program activity and 26 months during which DDACTS activity was reported. Since state-reported crash statistics were not yet available for 2012, the comparison range used monthly figures from January of 2008 through December 2011, yielding 31 months of no program activity against 17 months with reported deployments.

Results of this t-test analysis are reported in Table 4. When comparing the average monthly reports between the two groups, only robberies show minimal increase in the months of DDACTS activity, from 2.09 robberies per month to 2.15. Every other category shows a lower average in months with DDACTS activity than those without, which supports the immediate deterrent effect the program is intended to cause. However, only burglaries ($p=.007$) and thefts ($p=.015$) show a statistically significant relationship between months of program activity and reductions in reported numbers.

The lack of a significant relationship in the remaining statistics is not unexpected, however. First, in 2011 the Sheboygan Police Department changed the manner in which aggravated assaults – a UCR Part I Crime – are coded and reported, resulting in a substantial increase in the number of these crimes reflected in the Part I reports. This effect can clearly be seen in the differences in average monthly reports, where thefts and burglaries combine for a reduction in more than 29 incidents per month but the total Part I crime average is only 17 incidents per month lower. Furthermore, the crime categories of robberies and vehicle thefts are based on such small monthly numbers, making the impact of program activity

difficult to measure consistently. Finally, monthly reports of motor vehicle crashes generally have more to do with weather conditions than enforcement activity, as is apparent in figure 6 which shows expected spikes in winter months, and the monthly figures for alcohol crashes, similar to the figures for reported robberies and vehicle thefts, likely represent numbers too small for suitable statistical comparison.

Despite these limitations, the t-test shows very encouraging results for the success of the DDACTS program, particularly at accomplishing a simultaneous deterrent effect on the opportunistic crimes of burglary and theft. The diffused, long-term deterrent effect intended by the program is better demonstrated by the trends in annual and monthly reports of crime and crash statistics described in the results above, which also show substantial improvement in all crime and crash categories – even when including the increase in reported assaults, seasonal impacts on both crimes and traffic crashes, and other contextual influences. However, based on this analysis, the DDACTS program should take credit directly for the reduction of nearly 6 reported burglaries and 23 reported thefts per month while the DDACTS patrols were taking place, along with its contribution to the improvements in overall crime and crash statistics that show approximately 25% reductions from the years before program implementation to present figures.

The above analysis indicates whether the concurrence of DDACTS activity has an impact on reported crime and crash statistics in the same month, but do the numbers of deployment hours, citations or total contacts matter as well? A Pearson Correlation was used to determine if any specific relationship exists between these

variables and the crime and crash rates, results of which are shown in table 5. This comparison shows only a weak to moderate negative correlation between reported burglaries and the number of hours of DDACTS patrols in each month ($r=-.274$, $p=.036$) and total citations issued by DDACTS-assigned officers ($r=-.305$, $p=.019$).

Table 5: Correlations of DDACTS Activities and Reported Crimes/Crashes

		DDACTS Deployment Hours	DDACTS Citations	DDACTS Total Contacts
Total Part I Crimes	Pearson Correlation	-0.203	-0.173	-0.149
	Sig. (2-tailed)	0.123	0.19	0.26
Reported Robberies	Pearson Correlation	0.106	0.049	0.054
	Sig. (2-tailed)	0.426	0.715	0.683
Reported Burglaries	Pearson Correlation	-.274 [*]	-.305 [*]	-0.251
	Sig. (2-tailed)	0.036	0.019	0.055
Reported Thefts	Pearson Correlation	-0.232	-0.256	-0.217
	Sig. (2-tailed)	0.077	0.05	0.098
Reported Vehicle Thefts	Pearson Correlation	-0.118	-0.003	-0.04
	Sig. (2-tailed)	0.373	0.984	0.761
Reportable Motor Vehicle Crashes	Pearson Correlation	-0.123	-0.094	-0.119
	Sig. (2-tailed)	0.405	0.523	0.419
Reportable Alcohol-Related Crashes	Pearson Correlation	-0.064	-0.093	-0.084
	Sig. (2-tailed)	0.666	0.531	0.568

*. Correlation is significant at the 0.05 level (2-tailed).

Clearly the limitations explained above for the t-test comparison continue to have an impact on the correlation analysis conducted here, since it might be expected that a more significant relationship would be demonstrated with the other

variables of reported crime and crash rates. But these comparisons are still a useful consideration of the tactics employed, since they may indicate that the actual numbers of deployment hours, citations issued, or total contacts are not the true determining factors in deterring opportunistic crime. Instead, these results may be construed to validate the fundamental concept of DDACTS' effectiveness: that the tactic of increased and highly-visible police presence in identified hotspot areas has more of a deterrent effect than the specific numbers of contacts made or citations issued. In other words, the mere fact that in certain months the Sheboygan Police Department engaged in high-visibility enforcement patrols in the targeted hotspot areas had more of an impact on opportunistic crime than the particular number of hours of deployments, enforcement contacts made or citations written by those officers assigned to such patrols. This also appears consistent with the theory described by Bratton and Kelling that tactics – like hotspot policing – matter as part of a community-wide strategy to address public safety problems far more than the reactive measures of arrests and citations or even raw numbers of officers (Bratton & Kelling, 2012).

The program performance in accomplishing these output goals is also closely tied to the outcomes of improved public safety, since it is generally accepted that fewer crashes and crimes is analogous to improved public safety. The survey results do show that the DDACTS activity, along with other enforcement and outreach efforts, is having some impact on public perceptions. A strong majority indicates satisfaction with the police department's response to problem areas and a plurality

of respondents indicated they have perceived an increased response from the department to public safety problems both in specific locations and citywide. The department's efforts also appear to have had an impact on behavior, since a majority of respondents agree that they drive more carefully in areas of increased enforcement. Further, at least a portion report driving more safely now due to an increased fear of apprehension and also a belief that criminal opportunity has been reduced by greater police visibility and activity.

However, while the public ought to be experiencing substantial improvements in its perceptions of community safety based on the overwhelming reduction in occurrences of both crimes and crashes, the survey results indicate that the message of the program's success is not reaching them. Instead, very small proportions of survey respondents agree with improved feelings or perceptions of traffic safety and the potential for crime victimization, and a majority appears to believe that aggressive driving has gotten worse. These results indicate that the department could be doing more in support of the DDACTS guiding principles of "Partners and Stakeholder Participation" and "Information Sharing and Outreach." The good news is that these results do not undermine the success of the program, especially since the department can still conduct the community outreach and stakeholder involvement to share the positive results, thereby improving public perception and reinforcing the identified public safety outcomes.

For the final outcomes that address the DDACTS program's impact on internal departmental functioning, the interview results show that although each

agency reported positive experiences with the program's effect on crime and crash rates, they appear to have experienced a variety of sustainability results, both for the reduction in crime rates as well as the practices of engaging data analysis in daily police operations. It appears that agencies already familiar with the CompStat model would have an easier time finding a way to integrate the DDACTS model into administrative and tactical practices, as was the case in both Baltimore and Washoe Counties. Since data-based crime analysis was an existing part of the decision-making framework for these agencies, the DDACTS practices were a natural extension of current capabilities.

In the St. Albans, VT case study, the extent of the involved agencies' ongoing use of data analysis prior to implementation of the DDACTS program is unknown, but it does appear that their unique focus on sharing of information across all levels and all agencies involved was instrumental in encouraging adoption and continued use of the DDACTS principles. Only Ashland, WI reports no structural or procedural impacts on agency functioning as a result of their experience with DDACTS. Some of the difference may be explained by the size of the department, relative crime and crash rates, and extent of involvement of other agencies. These factors may make devoting additional resources – both administrative personnel to conduct data analysis as well as line personnel to conduct stepped-up enforcement in identified hotspots – difficult to justify.

However, the experience of the Sheboygan Police Department indicates that prioritizing data analysis and hotspot policing are not impossible, even with limited

resources. The Sheboygan Police Department has been able to integrate both practices into daily operations even after the extra grant-funded patrols have ended and without dedicated crime analysts on staff. It appears that the administrative decision to commit existing patrol personnel to hotspots almost daily, as well as encouraging administrators, patrol managers, and even patrol officers to conduct their own data analysis has led to buy-in from personnel at all levels and an increasing belief in the effectiveness and importance of such strategies. The timing of the Sheboygan Police Department's DDACTS experience also coincided with administrative efforts to implement the CompStat system and to move away from the traditional, reactionary policing model to more proactive methods. Hotspot policing was a natural fit alongside the department's other neighborhood policing and community outreach efforts.

As a result, the clearest internal impact of the DDACTS program on the Sheboygan Police Department is the action outcome of ongoing hotspot monitoring and the use of this information in directing police resources. Although the other outcomes of shared knowledge and increased cooperation between units are described as more of a work in progress, it is obvious that the department is committed to following through with these cultural and procedural changes and that this commitment has already brought about improvement in these areas.

Conclusion

The DDACTS program provides local law enforcement agencies with a well-developed set of techniques and processes to improve the deployment of limited police resources for the greatest impact on crime and traffic safety. The guiding principles established by the program's national authors allow for consistency in implementation across different types of police agencies and community demographics. Its reliance on data collection and analysis to continuously drive the deployment of police resources in response to crime not only lends itself well to ongoing program evaluation, but makes it a core requirement to proper implementation and administration of the plan.

It is interesting to note that although the country has experienced increased unemployment and an economic recession over the last several years, crime rates have not increased as expected. One reason identified by the late criminal justice scholar, James Q. Wilson, is the growing use of data to direct police resources. He notes that departments have become more disciplined in their use of data to reduce crime proactively rather than simply waiting for crime to occur, and this has had a macro-level impact on crime trends nationwide (Wilson, 2011). This national perspective lends credibility to local data-driven police activity as a significant causative factor impacting reductions in crimes and traffic crashes.

The Sheboygan Police Department's improved data analysis capabilities have coincided with its renewed mission to focus on the outcomes of reducing crime

along with the fear of crime, as well as engaging community partnerships and innovative solutions to increase public safety. This organizational environment has made the DDACTS program a natural fit within its other crime prevention strategies. It has aided in the department's transition to the CompStat model of geographic analysis and accountability and implementation of the neighborhood policing initiative, and the practices advocated by DDACTS have been well integrated into the daily functioning of the department. Administrators have become accustomed to directing patrol officers to spend unassigned time conducting high-visibility enforcement activities in areas with spikes in criminal activity, especially property crimes such as vehicle entries and burglaries. It is expected that when officers are not otherwise busy responding to calls for service, they will be active in these areas to increase police visibility, deter additional crimes, and improve the likelihood of apprehending criminals active in the area. Other internal changes, particularly regarding cooperation and information sharing between departmental units, are continuing in order to bring the department's functioning even more in line with the DDACTS principles.

As this evaluation shows, the Sheboygan Police Department should be very proud of its accomplishments with the DDACTS program, particularly in achieving output goals of substantial reductions in Part I crimes and reported motor vehicle crashes. Furthermore, the direct statistical link demonstrated between months of DDACTS activity and reported rates of thefts and burglaries should provide significant encouragement for both the department and the community that such

efforts do indeed contribute to simultaneous criminal deterrence and should continue to be supported.

The community survey shows favorable responses in community-wide satisfaction with the department's response to public safety issues and that the department's enforcement activity is having a perceptible impact on public behavior, particularly driving behavior in areas of high-visibility enforcement. However, fear of crime and perceptions of traffic safety have not improved in the face of substantial reductions in crime and crash rates as expected. The public seems to be unaware of the reduced risks of crime victimization or motor vehicle crashes that have coincided with the DDACTS program's activity and other departmental efforts; instead perceptions appear to be worsening.

Although this is likely due to inadequate sharing of – and public attention to – departmental efforts and reports on crime and crash rates to this point, it is also easily rectified by putting additional effort into publicizing this information now. By doing so, the Sheboygan Police Department could make significant progress in accomplishing the component of its mission that addresses fear of crime and perception of disorder, further increasing public satisfaction with the department's efforts. This information can have internal benefits as well, increasing buy-in among employees and program sustainability and continuing to foster necessary administrative and organizational changes to have the greatest impact on public safety.

In addition to working to align department workflows, sharing of information and tactical decision-making with the data-driven principles advocated by the program, the Sheboygan Police Department will also face the challenge of reduced manpower to devote to hotspot patrols, since the DDACTS-funded patrols were in addition to existing levels of patrol resources. It remains to be seen whether the capability to conduct hotspot patrols with regular police resources in time not devoted to responding to calls for service will be sufficient in sustaining the improved crime and crash rates for the long term, or if the benefits are already diminishing.

This research is limited by several factors, including the availability and condition of crime and crash data from the Sheboygan Police Department's records management system. The department's change in 2011 to a completely new software package and the shift to location-based tracking of reported incidents by neighborhood in 2010 made longitudinal comparisons difficult. Furthermore, the implementation of the DDACTS program was only one of a broad mix of policing strategies and programs adopted by the Sheboygan Police Department over the same timeframe, and took place against a backdrop of complex societal, economic and public perception factors as well. Nonetheless, the program does coincide with substantial improvement in Sheboygan's reported rates of crime and traffic crashes. Milwaukee Police Chief Ed Flynn, in recent discussion of the 1994 national assault weapons ban, said that requiring precise demonstration of direct causation is "foolish, it's rhetorical and doesn't relate to the reality of policing" and that

correlation such as the results found by this evaluation ought to suffice in showing a program or policy's impact (Umhoefer, 2013).

Although baseline data is available for crime and crash statistics, the ability to measure the program's impact on public perception and feelings of safety is limited to respondent self-assessment of attitudinal changes. Future research could be included in the pre-implementation planning and collection of data to address these shortcomings and provide a much more reliable indicator of program impact on public perceptions. Such baseline data could include pre-program surveys of community attitudes, live counts of public space usage and even traffic observation for aggressive driving behaviors. Future studies could even include surveys or interviews of known criminal offenders to assess the impact of high-visibility enforcement activity on criminal deterrence, particularly offenders prone to committing identified opportunistic crimes.

APPENDIX A

Community Survey

**Putting Police in the Box: The effectiveness of Data-Driven Law Enforcement
Survey Consent Information and Instructions**

You are invited to participate in a brief survey concerning crime and traffic safety in the City of Sheboygan. Direct mail survey recipients were selected at random across the city, and your participation is important to ensure that the research results include a full cross-section of the community.

The purpose of this survey is to help the researcher measure changes in your perception of the occurrence of crime, traffic crashes, and unsafe driving behavior over the course of a federally funded patrol program undertaken by the Sheboygan Police Department. Please answer the survey questions as honestly as possible. The results are intended to assist the Sheboygan Police Department with its response to crime and traffic safety concerns in the community.

I do not anticipate that taking this survey will contain any risk or inconvenience to you. Furthermore, your participation is strictly voluntary and you may withdraw your participation at any time without penalty. All information collected will be used only for my research and will be kept confidential. There will be no connection to you specifically in the results or in future publication of the results. If you have any questions please ask or contact:

OR

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Dr. Karl Nollenberger, Faculty Advisor
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Additionally, if you have any concerns about your rights or treatment as a participant in this study, please call or write:

Chair, Institutional Review Board for Protection of Human Participants
c/o Office of Grants and Faculty Development
UW Oshkosh
Oshkosh, WI 54901
(920) 424-3215

Although the chairperson may ask your name, all complaints are kept in confidence. By returning this survey in the enclosed return envelope, you are verifying that you have read the explanation of the study and that you agree to participate. You also understand that your participation in this study is strictly voluntary.

Thank you for your time and participation. **SURVEYS RETURNED AFTER MARCH 1ST WILL NOT BE ABLE TO BE INCLUDED IN THE RESEARCH.**

For each of the following statements, please circle a number from 1 to 5, with 1 indicating that you strongly agree with the statement and 5 that you strongly disagree with the statement. You should base your responses to your experiences with and perceptions of crime and traffic safety issues within the City of Sheboygan only.

If you are unsure about your response to one of the survey statements, please select an answer that most closely fits your response or choose "Neither Agree nor Disagree". **When you have completed the survey, please return it in the enclosed self-addressed, postage-paid envelope by March 1st, 2013. Thank you for your willingness to participate.**

K1. I have noticed an increase in police enforcement activity and visibility across the entire city compared to previous years.

Strongly Agree		Neither Agree nor Disagree		Strongly Disagree
1	2	3	4	5

K2. I have noticed an increase in police enforcement activity and visibility in specific neighborhoods and at specific intersections compared to previous years.

Strongly Agree		Neither Agree nor Disagree		Strongly Disagree
1	2	3	4	5

K3. I am satisfied with our police department's response to areas of crime and traffic problems.

Strongly Agree		Neither Agree nor Disagree		Strongly Disagree
1	2	3	4	5

K4. If I commit a crime or traffic violation, I know I'll get caught by the police.

Strongly Agree		Neither Agree nor Disagree		Strongly Disagree
1	2	3	4	5

K5. I am more likely to get pulled over if I commit a traffic violation now than in the past.

Strongly Agree		Neither Agree nor Disagree		Strongly Disagree
1	2	3	4	5

A6. I slow down and drive more carefully when I am travelling through an area where I have seen police pull over lots of cars.

Strongly Agree		Neither Agree nor Disagree		Strongly Disagree
1	2	3	4	5

A7. I have noticed fewer aggressive drivers this year compared to last year.

Strongly Agree		Neither Agree nor Disagree		Strongly Disagree
1	2	3	4	5

A8. I drive more safely now than last year because I am more likely to be stopped by police.

Strongly Agree		Neither Agree nor Disagree		Strongly Disagree
1	2	3	4	5

A9. Increased police activity and visibility in the city has helped reduce the opportunity for criminals to commit new crimes.

Strongly Agree _____ Neither Agree nor Disagree _____ Strongly Disagree _____
 1 2 3 4 5

C10. I have noticed fewer crashes in the city over the past year than in previous years.

Strongly Agree _____ Neither Agree nor Disagree _____ Strongly Disagree _____
 1 2 3 4 5

C11. I feel safer when traveling in a vehicle in the City of Sheboygan than I did in previous years.

Strongly Agree _____ Neither Agree nor Disagree _____ Strongly Disagree _____
 1 2 3 4 5

C12. I have noticed that other drivers are driving more safely this year because police are cracking down on traffic violations.

Strongly Agree _____ Neither Agree nor Disagree _____ Strongly Disagree _____
 1 2 3 4 5

C13. I am less likely to become a victim of crime in my neighborhood than last year.

Strongly Agree _____ Neither Agree nor Disagree _____ Strongly Disagree _____
 1 2 3 4 5

C14. I feel more comfortable walking in my neighborhood or using city parks than last year.

Strongly Agree _____ Neither Agree nor Disagree _____ Strongly Disagree _____
 1 2 3 4 5

Please answer the following demographic questions for verification purposes. The demographic information of survey respondents will be compared to overall census figures for the City of Sheboygan to verify that the responses received are representative of the community as a whole.

D15. I am: Male Female

D16. I am: 18 – 24 25 – 44 45 – 64 65 + years old.

D17. I am: Married Single/Divorced/Widowed

D18. Please check the race/ethnicity you best identify yourself with:

- | | |
|---|---|
| <input type="checkbox"/> White | <input type="checkbox"/> Native Hawaiian and Other Pacific Islander |
| <input type="checkbox"/> Black or African American | <input type="checkbox"/> Hispanic or Latino (of any race) |
| <input type="checkbox"/> American Indian or Alaska Native | <input type="checkbox"/> Two or more races |
| <input type="checkbox"/> Asian | <input type="checkbox"/> Some other race |

D19. I have lived in Sheboygan: Less than 5 years 5 – 20 years 20 years or more.

APPENDIX B

Interview Script

MPA-790: Field Project **INTERVIEW SCRIPT**

Putting Police in the Box: The effectiveness of Data-Driven Law Enforcement

Hello, my name is Kurt Zempel, I am a graduate student in the Masters of Public Administration program at UW-Oshkosh. I am working on a field project evaluating the effectiveness of the Data-Driven Approaches to Crime *and* Traffic Safety (DDACTS) program, and I discovered that your agency was previously a test site for this project. If you would be willing to answer some questions about your agency's experience with the DDACTS project, my research is particularly directed toward evaluating the impact the program had in creating a change in your agency's culture with regard to the use of data to deploy police resources outside of the grant-funded patrols.

- **Outputs:**

- Did the DDACTS program result in an increase in police activity, such as additional hours of police patrol and additional traffic contacts, citations, criminal arrests, etc?
- Was the DDACTS program effective at reducing rates of crime and traffic crashes in your jurisdiction in the targeted areas? In the community overall?

- **Knowledge outcomes:**

- Is there any evidence in your jurisdiction of increased fear of apprehension by traffic and criminal violators as a result of the grant-funded activity?
- Has the general public noticed and responded to the additional patrols favorably?
- Has the program's focus on data analysis and strategic deployment of police resources had an effect on your department's sharing of information between the various units involved in traffic enforcement and criminal investigation? How?

- **Action outcomes:**
 - Has the DDACTS program had a lasting deterrent effect on both unsafe driving behaviors and opportunistic crime in your jurisdiction?
 - Does your department continue to engage the data-analysis practices employed during the DDACTS grant to monitor “hotspot” activity and deploy police resources accordingly?
- **Condition outcomes:**
 - Has the DDACTS program improved cooperation between the various functional units of your agency? Between your agency and other municipal departments, jurisdictions, community groups or the public? How?
 - Has the DDACTS program had any other strategic or structural impacts on the functioning of your agency? The community as a whole?

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