National Highway Traffic Safety Administration
Our Mission: Save lives, prevent injuries, reduce vehicle-related crashes

DDACTS
DATA-DRIVEN APPROACHES TO CRIME AND TRAFFIC SAFETY

Operational Guidelines

Integrating "hot spot" technologies to establish effective methods for deploying law enforcement resources through analysis of crash and crime data.

March 2014

U.S. Department of Transportation
National Highway Traffic Safety Administration

NHTSA

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

NIJ National Institute of Justice

International Association of Directors of Law Enforcement Standards & Training IADLEST

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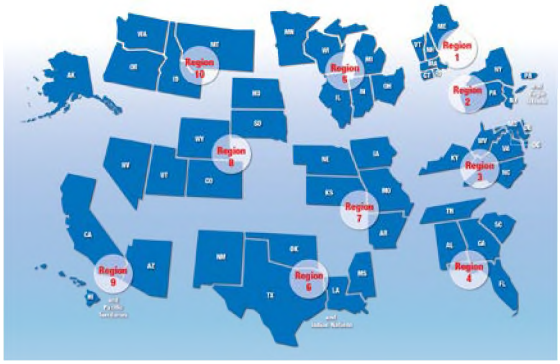

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International Association of Directors of Law Enforcement (IADLEST) provides project management and workshop implementations for DDACTS. The National Highway Transportation Safety Administration, the Bureau of Justice Assistance, and the National Institute of Justice collaborate to promote and support the DDACTS model.

Michael N. Becar, IADLEST Executive Director
1330 Manship Place
Meridian, ID 83642
Phone: (208) 288-5491

Resources: www.iadlest.org/Projects/DDACTS.aspx
www.nlearn.org
ddacts@googlegroups.com; Facebook/DDACTS; DDACTS on LinkedIn; or Twitter @DDACTS

DDACTS Implementation Workshops
For more information or questions regarding DDACTS, please contact the DDACTS National Project Manager at ddacts@iadlest.gov.

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EXECUTIVE SUMMARY

Data-Driven Approaches to Crime *and* Traffic Safety (DDACTS) is a law enforcement operational model supported by a partnership among the Department of Transportation's National Highway Traffic Safety Administration, and two agencies of the Department of Justice, the Bureau of Justice Assistance (BJA), and the National Institute of Justice (NIJ). DDACTS integrates location-based traffic crash, crime, calls for service and enforcement data to establish effective and efficient methods for deploying law enforcement resources. By identifying areas through temporal and spatial analysis that have high incidences of crashes and crime, DDACTS employs highly visible, targeted traffic enforcement to affect these areas. This model affords communities the dual benefit of reducing traffic crashes and crime, thus reducing overall social harm. Drawing on the deterrent value of highly visible traffic enforcement and the knowledge that crimes often involve the use of motor vehicles, the goal of DDACTS is to reduce the incidence of crashes, crime, and social harm in communities across the country.

The model's focus on the collaboration of law enforcement with citizens, communities, businesses, and community organizations reinforces the crucial role that partnerships play in reducing social harm and improving quality of life. Building on this collaboration, DDACTS positions highly visible, strategic traffic enforcement in the exact areas and at the exact times that police services are most needed.

The DDACTS Model

DDACTS ensures accountability and provides a dynamic, evidence-based problem-solving approach to crashes and crime. This approach, grounded in community-oriented and evidence-based policing, suggests that time and place-based policing, "…as opposed to [traditional] person-based policing, is more efficient as a focus of law enforcement actions; provides a more stable target for law enforcement activities; has a stronger evidence base; and raises fewer ethical and legal problems."[1] The application of highly visible traffic enforcement is a proven and effective countermeasure that addresses both crashes and crime whether they occur simultaneously or independently in time and/or location. Furthermore, its reliance on analysis to identify the nexus of crashes and crime provides a scientifically based method for law enforcement to plan its efforts.

As leaders of this national initiative to improve the quality of life in local communities, NHTSA, BJA, and NIJ are fortunate to have support from a number of national partners. The following organizations will offer technical assistance and in-kind resources through their local affiliates to support law enforcement agencies that use DDACTS:

- American Probation and Parole Association;
- Commission on Accreditation for Law Enforcement Agencies;
- Federal Highway Administration;
- Federal Motor Carrier Safety Administration;
- Governors Highway Safety Association;
- International Association of Chiefs of Police;
- International Association of Crime Analysts;

[1] Weisburd, D. (2008, January). Place-based Policing. *Ideas in American policing, Number 9.* Washington, DC: Police Foundation.

- International Association of Directors of Law Enforcement Standards and Training;
- National Criminal Justice Association;
- National District Attorneys Association;
- National Liquor Law Enforcement Association;
- National Organization of Black Law Enforcement Executives; and
- National Sheriffs' Association.

A Starting Point for Long-Term Change

Implementation of the DDACTS model is a starting point for achieving long-term change, where law enforcement professionals take a more evidence-based approach to the deployment of personnel and resources. The following presumptions about the future of law enforcement support the necessity for implementing DDACTS:

- Community-focused, place-based law enforcement will continue as an effective strategy for addressing current issues of social harm and safety concerns of citizens.
- Resources allocated for law enforcement activities are frequently not sufficient to keep pace with the demands placed on agencies to respond to calls for service and threats to public safety.
- Decreasing social harm and improving quality of life for communities continue to be primary missions of law enforcement agencies.
- The need for police executives to provide timely and accurate data to justify expenditures and deployment decisions will only increase as Federal, State, and local administrations, along with the public, continue to scrutinize the allocation of tax dollars.
- Technology will continue to improve the policies and practices of law enforcement. Existing and emerging technologies, such as smaller/faster computers, improved scanners and cameras, and the further application of information technology will greatly enhance the effectiveness of law enforcement practices.
- Law enforcement agencies will continue to collaborate and keep pace with other public and private service sectors that increasingly use information technology to assess needs, deploy resources, and manage costs.

Finally, because a shortage of law enforcement resources is likely to continue in the near future, police executives should continue to explore new strategies to improve quality of life in communities that suffer from high crash and crime rates.

Implementing the DDACTS Model

DDACTS relies on seven guiding principles, starting with building community partnerships to establish support for highly visible traffic enforcement and to aid in the development of strategic countermeasures. DDACTS is based on local data collection and analysis to identify crime, crashes, and traffic-related "hot spots." As law enforcement agencies employ DDACTS operational plans, routine information-sharing sessions with stakeholders reinforce the collective ownership of the initiative. Regular monitoring, evaluation, and the analysis of outcomes provide data-driven feedback for adjustments to DDACTS operational plans. This implementation guide outlines procedures and highlights operational considerations based on best practices in the field for each of the following seven guiding principles.

1. **Partners and Stakeholders Participation** —Partnerships among law enforcement agencies and with local stakeholders are essential and provide opportunities and support for decreasing social harm and improving the quality of life in a community.

2. **Data Collection** —Accurate and timely crash, crime, calls for service and enforcement-related data, including location, incident type, time of day, and day of week are the building blocks of DDACTS. Additional data may include arrests, citations, warnings, motor vehicle stops, citizen complaints, field interviews, and other nontraditional data such as the location of parolees and probationers, individuals with suspended or revoked licenses, and known offenders.

3. **Data Analysis** —The creation of actionable analysis products, including maps that overlay crash, crime, and enforcement-related data allows agencies to identify problem locations, or hot spots. Additional analysis, through a number of proven evaluation techniques, can distinguish causation factors for each type of incident, delineate spatial and temporal factors, and consider environmental influences on crashes, crimes, and other disorder or social harm.

4. **Strategic Operations** —Based on analysis, agencies are able to identify high activity hot spots, likely to include incidents of crashes, crimes, and other calls for service. These hot spots can then be targeted with strategic, highly visible traffic and other enforcement efforts at the most appropriate places and times. As discussed in the previous paragraph, hot spot analysis guides the realignment of workflow and operational assignments to focus highly visible traffic enforcement efforts and increase the efficiency of reducing social harm.

5. **Information Sharing and Outreach** —Built into the model are opportunities to share comprehensive results and actionable information internally and externally, promote community participation, and document accomplishments. Regularly generated progress reports give management the documentation needed to keep officers informed, hold meetings with community members, and report to government administrators and elected officials. Progress reports also provide the basis for ongoing media relations.

6. **Monitoring, Evaluation, and Adjustments** —Data collection and analysis procedures allow supervisors to monitor, evaluate, and **adjust** strategic operations and account for enforcement activity. They also provide an opportunity on a regular basis to assess crash and crime reduction, cost savings, and other outcome measures that define success. The DDACTS model is place-based and thus needs to keep pace with ever changing data.

7. **Outcomes** —Goals and objectives that emerge during hot spot identification and strategic plan preparation are developed into outcome measures. These measures are used to assess effectiveness relating to reductions in crashes, crime, traffic violations; cost savings; the use of specific operational techniques and personnel deployment. The DDACTS model supports increased measurement of outcomes and decreased measurement of outputs in determining the effectiveness and efficiency of law enforcement operations.

TABLE OF CONTENTS **Page**

Executive Summary ..... **ii**
Introduction **1**
Using the Guide 1
The DDACTS Model 1
The Use and Availability of Spatial Analysis 5
Mapping Technology and DDACTS 6
Baseline Data 6
Geographical Units of Analysis 6
Analysis of Crimes and Crashes 6
Spatial Clustering, a.k.a. Hot Spots 7
A Starting Point for Long-Term Change 7
Implementing DDACTS 9
Guiding Principle I - Partners and Stakeholder Participation **9**
Key Element I - ID and Make Initial Contact With Partners and Stakeholders 10
Key Element II - Develop a Plan for Partner and Stakeholder Participation 11
Guiding Principle II - Data Collection **12**
Key Element I - Review Current Data Collection and Analysis System 12
Key Element II - Finalize Selection of Mapping Software 13
Key Element III - Create a Data Collection Plan and Identify Data Sources 14
Guiding Principle III - Data Analysis **14**
Key Element I - Develop a Clear Process for Data Analysis 15
Key Element II - Develop Reporting Procedures 16
Guiding Principle IV - Strategic Operations **17**
Key Element I - Identify Strategies and Tactics 17
Key Element II - Develop an Operational Plan 18
Key Element III - Implement Plan 19
Guiding Principle V - Information Sharing and Outreach **20**
Key Element I - Review Partner and Stakeholder Plan 20
Key Element II - Develop a Plan for Communicating 21
Guiding Principle VI - Monitoring, Evaluation, and Adjustments **22**
Key Element I - Use Data and Other Information to Make Adjustments 22
Key Element II - Document and Report Changes 23
Guiding Principle VII – Outcomes **24**
National Support for DDACTS **25**
Appendix A – Reference / Resources **27**
Appendix B - Glossary of Selected Terms **30**
Appendix C - A Framework for Mapping Technology Implementation **32**

Data-Driven Approaches to Crime *and* Traffic Safety (DDACTS)

INTRODUCTION

Data-Driven Approaches to Crime *and* Traffic Safety (DDACTS) is a law enforcement operational model supported by a partnership between the Department of Transportation's National Highway Traffic Safety Administration and two agencies of the Department of Justice, the Bureau of Justice Assistance, and the National Institute of Justice. DDACTS integrates location-based crash, crime, calls for service and enforcement data to establish effective and efficient methods for deploying law enforcement resources. By identifying areas, through temporal and spatial analysis, with high incidences of crime and crashes, DDACTS employs highly visible traffic enforcement strategies. By targeting high crash hot spots that are within high crime areas with highly visible traffic enforcement, the DDACTS model affords communities the dual benefit of reducing traffic crashes and crime thus reducing overall social harm. Drawing on the deterrent value of highly visible traffic enforcement and the knowledge that crimes often involve the use of motor vehicles, the goal of DDACTS is to reduce the incidence of crashes and crime, and thus reducing social harm in communities across the country.

Using the Guide

This guide presents procedures and recommended practices for communities to build a DDACTS implementation plan built upon the seven guiding principles that characterize comprehensive community-based law enforcement. The principles are (1) partners and stakeholder participation; (2) data collection; (3) data analysis; (4) strategic operations; (5) information sharing and outreach; (6) monitoring, evaluation, and adjustment; and (7) outcomes.

Beginning with an overview of DDACTS, the guide highlights research demonstrating the traffic safety and crime prevention benefits derived from strategically directed and highly visible traffic enforcement. The overview is followed by a general discussion of the use of analysis to drive operations. The main section presents the guiding principles, implementation considerations, and reference materials.

The DDACTS Model

As leaders of this national initiative to improve the quality of life in local communities, NHTSA, BJA, and NIJ understand the challenges faced by law enforcement executives, who strive to weigh competing demands for police services against the allocation of limited resources. Designed to address this challenge, DDACTS ensures accountability and provides a dynamic, problem-solving approach to crashes and crime. Ultimately, DDACTS aims to improve the quality of life in local communities by diminishing social harm caused by both traffic crashes and crime.

This approach, similar to community- and problem-oriented policing, suggests that place-based policing, "…as opposed to person-based policing, is more efficient as a focus of law enforcement actions; provides a more stable target for law enforcement activities; has a

stronger evidence base; and raises fewer ethical and legal problems."[2] The application of highly visible traffic enforcement is a proven and effective tactic that addresses both crashes and crime whether they occur simultaneously or independently in time or location. Furthermore, its reliance on analysis to identify the nexus of crashes and crime acknowledges the important role that data and technology play in law enforcement and other public safety arenas.

DDACTS builds on more than 35 years of research illustrating the residual crime control and traffic safety benefits resulting from data-driven, strategically directed traffic enforcement. One of the key elements of the DDACTS model is the nexus between the strategy and tactics of traffic enforcement and the prevention of crime. In other words, the application of *highly visible* traffic enforcement is a proven and effective strategy that addresses both crime and crashes whether they occur simultaneously or independently in time and/or location.

The relationship between traffic crashes, crime, and place-based policing has been the subject of a number of studies, each contributing an important piece to our understanding. Findings of several studies are highlighted as follows:

- In 1975, a study of 119 vehicular homicide cases indicated that victims and offenders were similar to those involved in other violent crimes in that "the tendency toward aggressive behavior, characteristic of a subculture of violence, influences the way an individual drives as well as his face-to-face interactions."[3]

- In 1978, James Wilson and Barbara Boland conducted a quantitative study to measure whether the policing style of a community had an effect on crime. In this study, Wilson and Boland examined law enforcement activity in 35 large American cities. This rigorous quantitative study concluded that cities that demonstrated "patrol aggressiveness" experienced the lowest rates of commercial robbery. They argued that, "by stopping, questioning, and otherwise closely observing citizens, especially suspicious ones, the police are more likely to find fugitives, detect contraband (such as stolen property or concealed weapons), and apprehend persons fleeing from the scene of a crime." They also suggested that, "an aggressive patrol strategy will affect the crime rate directly, and not only through its effect on the arrest rate, if it leads would-be offenders to believe that their chances of being arrested have increased, even though they have not."[4]

- In 1988, Robert Sampson and Jacqueline Cohen conducted a replication of the Wilson-Boland study using data from 171 American cities with populations over 100,000. As their measure of patrol aggressiveness, they used arrests per officer for driving under the influence

[2] Ibid..
[3] Michalowski, R. J. (1975, January). Violence in the road: The crime of vehicular homicide. *Journal of Research in Crime and Delinquency, 12*(1), 30-43 (NCJ Publication No. 019248). Retrieved from www.ncjrs.gov/App/Publications/abstract.aspx?ID=19248
[4] Wilson, J. Q., & Boland, B. (1979). *Effect of the police on crime.* (NCJ Publication No. 058531). Retrieved from www.ncjrs.gov/app/publications/abstract.aspx?ID=58531

and arrests for disorderly conduct. Sampson and Cohen concluded that aggressive policing had a strong effect on increasing the certainty of arrest for robbery.[5]

- In 1989, a study indicated that in Minneapolis, 3.5% of the addresses accounted for 50% of the calls for service.[6]

- In 1992, a NIJ funded study in Kansas City, Missouri, had patrol officers focus on gun detection through aggressive patrol and increased vehicle stops. The results were striking in that gun seizures increased by 65% with no displacement to other areas, drive by shootings decreased by over 80% with no displacement, homicides were reduced and residents in the target area became less fearful of crime and more positive about their neighborhood.[7]

- In 1994, a study indicated that, in general, crime is not displaced and, in fact, surrounding areas often benefit from place-based strategies.[8]

- In 1994-1996, Peoria, Illinois, increased traffic enforcement with the assistance of the Illinois State Police and Peoria County Sheriff's Office. This resulted in significant reductions in traffic crashes, violent crime, property crime, and calls for service.[9]

- In 1995, Indianapolis, the police department increased traffic enforcement in eight patrol beats over a 6-week period resulting in significant decreases in burglaries and vehicle thefts. An interesting finding of this study is that a diffusion of these benefits (lower crime) was also realized in contiguous beat areas.[10]

- In 1997, police in Albuquerque, New Mexico, implemented a Safe Streets program involving saturation patrols, follow-up patrols, freeway speed enforcement, and sobriety checkpoints. The Safe Streets Program was developed after determining 27 of 33 high-crash locations were in only four general geographic areas, all four were also high-crime areas. The results were impressive in that there was a 9 percent decline in property damage crashes, 18% decline in injury crashes, 20% decline in driving while impaired (DWI) crashes, 34% decline

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[5] Sampson, R. J., & Cohen, J. (1988). *Deterrent effects of the police on crime: A replication and theoretical extension.* (NCJ Publication No. 115826). Retrieved from www.ncjrs.gov/app/publications/abstract.aspx?ID=115826

[6] Sherman, L. W., Gartin, P. R., & Buerger, M. E. (1989). Hot spots of predatory crime: Routing activities and the criminology of place, *Criminology, 27, 1,* 27-55 (NCJ Publication No. 115865). Retrieved from www.ncjrs.gov/App/Publications/abstract.aspx?ID=115865

[7] Sherman, L. W., Shaw, J. W., & Rogan, D. P. (1995). *The Kansas City gun experiment, Research in brief,* Washington, DC: National Institute of Justice; NCJ 150855; and Sherman, L. W., & Rogan, D. P. (1995). The effects of gun seizures on gun violence: 'Hot spots' patrol in Kansas City. *Justice Quarterly 12,* 673–693.

[8] Clarke, R. V., & Weisburd, D. (1994). Diffusion of crime control benefits: Observations on the reverse of displacement, *Crime Prevention Studies, Volume 2*, 165-183 (NCJ Publication No. 147834).

[9] National Highway Traffic Safety Administration. (1997). *The Peoria experience, Traffic enforcement and crime: It plays in Peoria.* Washington, DC: Author. Availabler at: http://www.nhtsa.gov/people/injury/enforce/peoria/peoria.pdf

[10] McGarrell, E. F., Chernak, S., & Weiss, A. (2002, November). Reducing gun violence: Evaluation of the Indianapolis Police Department's directed patrol project (NCJ Publication No. 188740). Washington, DC: National Institute of Justice.

in fatal crashes, 29% decline in homicides, 17% decline in kidnapping, and a ten percent decline in assaults.[11]

- In a 2000 study by David Giacopassi and David Forde, the relationship between traffic fatalities and crime was examined. Their study indicated, "traffic fatalities are indices of incivility and aggression, indicating a disregard for social conventions, leading to more serious normative violations like homicide." Moreover, they suggested that when law enforcement agencies pay inadequate attention to traffic law violations it could lead to "a general condition where people feel they may break the law with impunity."[12]

- In 2001, a report entitled, "Traffic Safety in the New Millennium," encouraged law enforcement executives to treat traffic safety as a core value, integrate traffic safety throughout their agencies, provide traffic safety training, equipment, staffing and emphasize the importance of traffic safety to all employees.[13]

- In 2004, Skogan and Frydal indicated that focusing police resources on place-based hot spots provide the strongest police effectiveness that is available.[14]

- In 2004, another study tells us that strategies focused only on offender data often changes because they "age out" of crime, whereas a focus on crime and crashes tends to be much more stable over time.[15]

- In 2007, an article in Police Chief Magazine indicates Northwestern University's Statistical and Tactical Approaches to Traffic Safety (STATS) supports and encourages sustainable traffic enforcement without Federal funding, data analysis to drive resource allocation, and traffic enforcement to reduce crashes and criminal activity.[16]

- Published in 2011, a long-term study looked at juvenile crime in Seattle. The study indicated that over a 14-year period from 1989 to 2002, half of all juvenile crime occurred at less than 1 percent of Seattle's street segments.[17]

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[11] Stuster, J., (2001). *Albuquerque Police Department: Safe streets program.* (Report No. DOT HS 809 278). Washington D.C.: National Highway Traffic Safety Administration. Available at http://www.nhtsa.gov/people/injury/enforce/SafeStreets/index.htm#toc

[12] Giacopassi, D. & Forde, D. R. (2000) Broken windows, crumpled fenders, and crime. *Journal of Criminal Justice 28* (5), 397–405.

[13] IACP & NHTSA (2001). *Traffic safety in the new millennium*. Alexandria, VA: International Association of Chiefs of Police, Washington, DC: National Highway Traffic Safety Administration. Available at www.nhtsa.gov/people/injury/enforce/trafficsafety.pdf

[14] Skogan, W., & Frydl, K. (2004). National Research Council of the National Academies. *Fairness and effectiveness in policing: The evidence*. Washington, D.C.: National Academies Press.

[15] Weisburd, D., Bushway, S., Lum, C., & Yang, S. (2004). "Trajectories of crime at places: A longitudinal study of street segments in the City of Seattle." *Criminology 42*(2), 283-322.

[16] Weiss, A., & Morckel, K. (2007, July). Strategic and tactical approaches to traffic safety. *Police Chief Magazine. 74*(7).

[17] Weisburd, D., Groff, E., & Morris, N. (2011, October). *Hot spots of juvenile crime: Findings from Seattle.* Washington, DC: Office of Juvenile Justice and Delinquency Prevention.

The Use and Availability of Spatial Analysis[18]

A digital point or dot map is essentially an online version of a traditional wall map on which pins are placed to represent crash and crime events. It comprises a series of points (dots representing locations of crash and crime incidents), lines (depicting street networks), and polygons (demarking jurisdictional boundaries or precincts). These types of simple maps were used historically by law enforcement to identify problem areas.

DDACTS extends beyond these simplified maps and seeks to use modern GIS to identify areas with disproportionately high incidences of crime and crashes. Analysts can evaluate these incidences in the context of longitudinal -time-patterns and trends. Identification and analysis of causal factors can then support the application of strategic, effective, and efficient responses based in problem-oriented and intelligence-led policing approaches. Geographic technologies have significantly improved the ability of analysts and researchers to understand crime and traffic patterns, as well as patterns of victimization. The use of spatial statistical techniques to identify clusters of crashes and crime provides firm evidence that these incidents often overlap in place and time. This identification of hot spots allows police to apply highly visible enforcement measures to affect crashes and crime together.

The use of GIS is growing in local government and across the public sector. In turn, GIS and spatial analysis technologies are widely available to law enforcement agencies as county and municipal governments invest in multipurpose mapping applications. GIS is used to support planning, resource deployment and infrastructure maintenance in even the smallest communities. Such use by law enforcement agencies helps to provide better understanding of problems within their jurisdictions. In such instances, learning about and using GIS applications (and contributing data to them) can help meet the specific mapping needs of law enforcement and create opportunities to access existing GIS capabilities.

There are many GIS software packages and programs capable of and even specifically designed for mapping crime and traffic incidents. Most major commercial GIS software packages can produce quality results for DDACTS mapping objectives. There are also free spatial statistical software and mapping applications available. These often have limited functionality in data transfer and analytical capability, but they can be useful in helping agencies to get started with mapping and spatial analysis. For example, CrimeStat is a crime mapping Windows-based analysis tool available through the National Institute of Justice.

Mapping requires a diverse set of skills including highly developed visual-spatial abilities, a facility for data management, and a creative way of thinking about the acquisition and use of various types of data. Along with these skills, mapping requires vigilant attention to data quality. Therefore, law enforcement executives will need to identify staff members who demonstrate an aptitude for analysis and provide them with the necessary training and resources.

The extent to which law enforcement agencies are using crime and crash mapping varies greatly, as do the analytical techniques used, the staff or "crime analyst" involved in the

[18] Unless otherwise implied, information presented in this section is attributed to the following article: Markovic, J., Bueermann, J., & Smith, K. (2006, June). Coming to terms with geographical information systems. *The Police Chief, 73*(6).

process, and the manner in which mapping is used for deployment decisions. In spite of this variation, as more law enforcement agencies adopt DDACTS and other data-driven approaches, the need for trained personnel and the importance of mapping will grow steadily. Ultimately, the usefulness of geographic technology rests with the proficiency of the individuals using it and the quality of the data used.

Mapping Technology and DDACTS

To measure the effectiveness of highly visible enforcement, law enforcement executives must be prepared to track crash, crime, and enforcement data from the entire jurisdiction. This allows for comparisons among areas in which DDACTS strategies and tactics are applied and other defined areas. The information below addresses some basic considerations for using GIS and spatial analysis software technology to implement DDACTS. It includes preliminary details on the use of spatial clustering techniques for identifying and analyzing hot spots.

Baseline Data

Since crash and crime frequencies are highly variable from year to year[19] [20] police departments should use three to five years of historical data to establish a baseline for analysis, if such data is available. The use of a single year of crash and crime data for identifying high crash and high crime locations may yield misleading results.

Geographical Units of Analysis

Analysts should select small geographical units for analysis, such as specific map areas, parcels or even the application of a grid system. This will allow for some degree of correlation between crashes and crimes, given they do not occur in the exact same space. Additional geographical units to consider may include traffic zones, police beats, or other administrative units, which are larger and will increase the strength of the relationship between crime and crash locations and assist in the development of specific responses and efficient deployment of resources.

There are two reasons for using small geographical units. First, most crashes occur on roads and most crimes occur either on sidewalks or within a property boundary (parcel), so exact locations will rarely coincide. Second, common factors are likely to involve the interaction between the road system and the land uses it traverses.

Analysis of Crashes and Crime

To be effective, hot spot analysis must account for the type of crime or crash, its location, and the time of day that it occurred. Thus, the deployment of highly visible enforcement will be driven by knowing whether a hot spot has an abundance of driving while impaired (DWI) crashes, auto thefts, and robberies, for example, that may occur mostly in the evening, as opposed to other types of crashes and crimes that may occur mostly in the morning and afternoon.

[19] Nicholson, A. J. (1985). The variability of accident counts. *Accident Analysis and Prevention*. *17*(1), 47-56.
[20] Nicholson, A. J. (1986). The randomness of accident counts. *Accident Analysis and Prevention*. *18*(3), 193-198.

Spatial Clustering, a.k.a. Hot Spots

Optimally, analysts will use spatial clustering techniques to identify hot spots of overlapping crashes and crimes. The analysis begins with a global analysis and then proceeds to hot spot identification. The purpose of the global analysis is two-fold: one to determine if clustering exists at all in the jurisdiction, and two, to determine how much one cluster [i.e. data group] is more clustered than the other. Analysis of clusters or hot spots can then give rise to temporal analysis and the appropriate and efficient deployment of resources.

Appendix C, **A Framework for Mapping Technology Implementation,** gives detailed information and suggested procedures on the use of spatial clustering and hot spot evaluation techniques.

For additional information on mapping techniques, see Eck, J. E. et al. (2005, August). *Mapping crime: Understanding hot spots,* listed in Appendix A, reference section.

The identification of hot spots using spatial and temporal analysis techniques is the foundation of DDACTS. These analyses will provide stronger evidence for a concentration of crashes and crime and provide an objective framework for deployment of resources and strategic high-visibility enforcement actions.

As the role of crime and crash analyses, hot spot identification, and the efficient deployment of scarce public service resources are becoming the benchmarks of 21st century policing, law enforcement managers should understand the theory, processes, and nomenclature of these principles.

A Starting Point for Long-Term Change

As mentioned earlier in the Executive Summary, implementation of DDACTS is a starting point for achieving long-term change where law enforcement professionals take a more integrated approach to the deployment of officers and resources. The following presumptions about the future of law enforcement support the need for implementing DDACTS:

- Resources not sufficient to keep pace with the demands to respond to calls for service and threats to public safety;
- Decreasing social harm and improving quality of life for communities;
- The need for timely and accurate data to justify expenditures and deployment decisions;
- Technology has and will continue to affect the policies and practices of law enforcement;
- Law enforcement agencies must collaborate and keep pace assessing needs, delivering services, and managing costs; and
- Community-focused, place-based law enforcement has emerged as an effective strategy for addressing public safety.

Police executives should continue to explore new strategies to further improve quality of life in communities that suffer from the effects of high-crime and crash rates, because the shortage of police resources is likely to continue in the future. A note of thanks to each of you for your participation in the DDACTS workshop and willingness to embrace a new paradigm as you strive to make your communities safer. The hope is that this information is beneficial to you and we want to continue to offer support as you go forward applying the guiding principles. The DDACTS model works and we know you can implement this program to make a difference in your towns, reducing crashes and crime.

IMPLEMENTING DDACTS

In addition to recognizing the efficiency and effectiveness of traffic enforcement as a tool for reducing crashes and crime, DDACTS positions traffic enforcement as a logical rationale for a highly visible law enforcement presence in a community. Its focus on collaboration with citizens, community businesses, and community organizations reinforces the important role that partnerships play in reducing social harm. Furthermore, by analyzing the place-based relationship between crashes and crime, DDACTS gives law enforcement agencies an opportunity to use an effective intervention to address both problems.

As law enforcement agencies implement these plans, it is suggested that regular information-sharing sessions with partners and stakeholders reinforce the collective ownership of DDACTS. Finally, monitoring, evaluation, and analysis of outcomes provide data-driven feedback for needed operational adjustments.

The following sections elaborate on the seven guiding principles. They outline implementation procedures and highlight operational considerations based on best practices in the field. Although the principles are presented sequentially, many of the activities may be undertaken simultaneously.

Guiding Principle I--Partners and Stakeholder Participation

Partnerships among criminal justice agencies, law enforcement agencies, and local stakeholders are essential to the success of the DDACTS model. Stakeholders may contribute data and other information, help promote the initiative to the community, and provide important feedback on how the community is reacting to increased traffic enforcement. In simple terms, a stakeholder is a person or group that has an interest in community and traffic safety. A partner is a person or group that not only has a stake but also is willing to take action. Both are important but should be considered separately.

As part of DDACTS partnership efforts, law enforcement agencies will need to reach out to stakeholders and partners. Stakeholders and partners can include any individual, business, or organization that is interested in reducing social harm and improving the quality of life in a particular community, such as:

- Local civic and business organizations such as Rotary Clubs and Chambers of Commerce;
- State Departments of Social Services;
- Local government agencies such as courts, Offices of the District Attorney, Departments of Corrections, Divisions of Probation and Parole, licensing bureaus, Departments of Transportation, Metropolitan Planning Organizations;
- Law enforcement agencies with concurrent jurisdictions: State police, sheriffs' offices, adjacent local and municipal law enforcement agencies;
- Elected officials;
- Crime or crash victims;
- Neighborhood associations;
- Community leaders;

- Urban renewal groups such as "Weed and Seed" organizations;
- Commercial establishments;
- Media; and
- Other organizations with an interest in crime reduction and traffic safety issues.

Stakeholder and partner support for highly visible traffic enforcement is vital to the success of a DDACTS initiative. Therefore, it is very important to allow enough lead time to engage and develop stakeholder and partner input.

For additional information on partnerships and stakeholders, see Schmerler, K., et al. (1998, April; Revised 2006, July) *Problem-solving tips: A guide to reducing crime and disorder through problem-solving partnerships;* listed in Appendix A, reference section.

Key Element I - Identify and Make Initial Contact with Potential Partners and Stakeholders

Look for traditional as well as nontraditional partners and stakeholders to engage in discussions regarding the logic behind a DDACTS initiative. Focus on local organizations and businesses most impacted by the social harm currently prevalent in the identified hot spots. The partners' or stakeholders' contributions or roles regarding their support of the DDACTS initiative should be a main topic of these discussions.

Action Items

- Develop a list of partner and stakeholder categories.
- Identify known individuals, businesses, and organizations for each category.
- Identify the assistance, support, or data that partners or stakeholders might provide.
- Assign personnel responsible for contacting partners and stakeholders.
- Give a DDACTS overview to each potential partner and stakeholder.

Considerations

- Community residents and businesses are a good source of information about where and when traffic safety issues and criminal activity occur.
- Solicit law enforcement staff for input regarding partner and stakeholder participation.

A written description of the DDACTS initiative and the role that partners and stakeholders might play can help them make decisions regarding participation. (Agencies can modify NHTSA's brochure describing the DDACTS initiative for this purpose.)

"The Thibodaux Police Department engages our partners and stakeholders with personal contacts, public CompStat forums, and social media. By managing our message of total data-reliance for identifying and strategically addressing social harms, the DDACTS philosophy engrains itself into the agency's culture and endears itself within the community's perception of safety."
~ Chief Scott Silverii, Thibodaux, Louisiana Police Department

Key Element II - Develop a Plan for Partner and Stakeholder Participation

Partners and stakeholder groups will make different contributions to the DDACTS initiative, directly and indirectly. In some instances, they will lend credibility to the use of highly visible enforcement; in other instances, they might provide access to various populations within a community or provide information about incidents regarding traffic safety concerns and criminal activity. The following considerations for plan development include the need to:

- Identify the various roles and contributions that partners and stakeholders can make to the DDACTS initiative;
- Develop organizational structures that define expectations and interactions (e.g., coalition, advisory group, working group);
- Create specific objectives for partner and stakeholder participation;
- Define expectations for the agency's interactions with partners and stakeholders (e.g., number and frequency of meetings, reporting of DDACTS activities);
- Delineate staff responsibilities for interactions with various partner and stakeholder groups (e.g., documentation of meetings, calls, and e-mails); and
- Identify resources for hosting partner and stakeholder participation (e.g., meeting rooms, presentation technology).

Our SIU (Special Investigations Unit) contacted every business in our DDACTS area to meet personally, explain the goals and expectations in the DDACTS area, and to inform them about highly visible operations and increased police presence. ~ Captain Bill Hisle, Shawnee Kansas Police Department

Action Items

- Assign responsibility and a timeframe for plan development.
- Assign responsibility for logistical and administrative support.
- Conduct initial and follow-up meetings with partners and stakeholders.
- Designate partners and stakeholders who will provide feedback and public support to achieve consensus for the final plan.
- Distribute the plan.
- Implement the plan.

Considerations

- Allocate sufficient time for partner and stakeholder outreach and the formation of relationships.
- Make sure partner and stakeholder relationships are in place before starting enforcement activities.
- Invite partners and stakeholders to internal planning sessions, when appropriate.
- Always document interactions with stakeholders.
- Seek opportunities to promote stakeholder support.

Guiding Principle II – Data Collection

Accurate and timely crash, crime, calls for service and enforcement data are the building blocks of DDACTS. At a minimum, the data must include accurate and complete information on location, date, time, and incident type. If possible, it is also of great value to have access to crash and crime causation factors, enforcement activity such as citations, warnings, arrests, field interviews/contacts, citizen complaints, etc. Further information and/or data regarding violations, known offenders, probation and/or parole, census tracts, property-related information, community factors and other non-traditional data types can also be extremely valuable. Access to the data and consistency of data quality must also be considered. Ultimately, the data is only data until the analysis process turns it into actionable information.

For additional information on data collection and analysis, see Boba, R. (2003, March), *Problem analysis in policing,* and Schmerler, K., et al. (1998, April; Revised 2006, July), *Problem-solving tips: A guide to reducing crime and disorder through problem-solving partnerships;* listed in Appendix A, reference section.

Key Element I - Review Current Data Collection and Analysis System

A review of the current system includes assessment of existing computer-aided dispatch (CAD) and records managements systems (RMS) capabilities, policies, procedures and protocols, report writing and report review and priorities for accurate, timely and complete data collection, data access and formats, data consistency, and software and hardware needs in regard to data access and collection. The following action items provide an overview of the areas to examine when assessing an agency's data collection and analysis system as a precursor to undertaking a DDACTS initiative.

Action Items

- DDACTS requires that someone be assigned the responsibility for data collection and analysis. Identify the need for additional staff or training of current staff to undertake the collection, mapping, and analysis of crash, crime, calls for service and enforcement data.
- Examine existing capabilities for data access, collection, analysis, and mapping and consider the possibility of the need to acquire hardware and/or software applications to support these efforts.
- Give special consideration to location data and identify ways in which addresses are verified within the CAD and/or RMS. These data points could be used to support mapping, hot spot identification and other spatial analysis methods.

Considerations

- Agencies should start implementing DDACTS with whatever data and analysis is available. DDACTS does not necessarily require sophisticated or expensive software systems. The implementation will allow agencies to assess capabilities and develop plans for improvement, if needed.

- DDACTS requires expertise in crime and traffic data collection and analysis. As law enforcement executives assess personnel resources, consideration should be given to these responsibilities and whether they can be addressed with existing personnel.
- Agencies pursuing implementation of DDACTS, but not currently using information technology for crime and traffic data analysis, can seek technical assistance through International Association of Crime Analysts (IACA), Federal, State, and local government agencies to identify systems used in other jurisdictions.
- Assessing the current data collection system provides an opportunity for management to examine data requirements, compatibility with other data systems, and data accessibility.
- Information generated from DDACTS can provide an opportunity to modify and expand reporting protocols and make greater and more efficient use of data collection and information-sharing systems.

> *"We are all being asked to do more with less. Our resources are strained and very limited. A great data collection and analysis plan supports our overall goal to best utilize what we have. If the data is accurate and mined properly, it will maximize the likelihood of deploying in the area that would most benefit our community. The mapping system does not need to be expensive or state-of-the-art. It just needs to be a tool to provide a visual for analysis and deployment. Data collection is the platform needed to build the model, therefore a necessary cog in the DDACTS wheel."*
> *~ Inspector Christine Coulter, Philadelphia Police Department*

Key Element II - Finalize Selection of Mapping Software

Based on its current software and hardware systems for analyzing crime and crashes, agency staff can determine the need for additional mapping resources. Agencies without in-house capabilities can examine traditional approaches for mapping or identify additional resources and partnering opportunities to develop mapping capabilities.

Action Items

- Identify all existing access to GIS and mapping resources and capabilities. Many large and small communities and jurisdictions have GIS departments and/or networked GIS software that a police agency may be able to make use of for its own needs. Local GIS professionals may be able to offer mapping services and support. These resources should be identified prior to making any GIS purchasing decisions.
- Begin building a case for budget allocations in support of mapping hardware and software for future budget cycles.

Considerations

- Consider seeking technical assistance and funding through Federal, State, and local government agencies that might provide support for data collection, analysis, and mapping tools.
- Consult with agencies that have mapping programs to obtain input regarding free and commercial mapping programs.

- Be aware of the limitations of proprietary off-the-shelf software (e.g., interoperability, transfer limitations, licensing fees).
- Explore the use of shared systems with internal and external partners.

Key Element III - Create a Data Collection Plan and Identify Data Sources

The data collection process starts the minute a call for service is received or enforcement action is initiated. It is critical that the process, standard operating procedures, policies, and systems that are in any way related to data collection be reviewed and understood. Plans should be developed to address any identified needs.

Analysis, including mapping, can only be as good as the data that it is based upon. Data collection requires hardware and software to support any level of reporting efficiency, but data quality, accuracy, timeliness and completeness relies upon a prioritized system of report writing and report review, assisted by technology. Success at reducing social harm through DDACTS is dependent upon the accurate identification of crash and crime hot spots, and that identification is reliant upon accurate, timely, and complete data. This need for accurate data reporting must be acknowledged and understood by all agency personnel.

Action Items

- Identify the specific data to be collected.
- Incorporate data storage systems.
- Identify data sources.
- Develop guidelines for data quality control.
- Ensure that data gaps are identified and addressed.
- Identify protocols/data collection procedures.
- Develop a process and plan for data access.

Considerations

- Give all appropriate personnel the opportunity to make recommendations about the types of data the agency will collect and analyze.
- Obtain input from community stakeholders about nontraditional data that might enhance hot spot analysis.
- Consider how community stakeholders will react to the data collection plan. Be prepared to explain the benefits of all information being collected.

Guiding Principle III - Data Analysis

The analysis of crashes, crimes, and calls for service allows agencies to identify high-activity hot spots within the jurisdiction. Research has shown that crashes, crimes and other social harms tend to cluster in geographic space and time. Examples may include crashes involving serious injuries at a specific intersection or curve along a stretch of roadway. Robberies may be common at convenience stores or automated teller machines or speeding along a stretch of highway may

be common just after the evening rush hour period. Research has further shown us that clusters of crashes, crimes and other social harms and disorder may overlap.

The utilization of data to identify these hot spots can help agencies identify locations where highly visible traffic enforcement can impact a variety of public safety issues, ultimately achieving reductions in both crimes and crashes. The ability to graphically display these overlapping hot spots on a map can provide commanders and supervisors, as well as partners and stakeholders, with further justification and support for strategic, effective, and efficient deployment of resources.

For additional information on data analysis and hot spots, see Eck, J. E., et al. (2005, August). *Mapping crime: Understanding hot spots*, listed in Appendix A, reference section.

Key Element I - Develop a Clear Process for Data Analysis

DDACTS is applicable for agencies at both ends of the analysis spectrum. Those agencies that already employ professional analysts and support analysis units will find that the Guiding Principles of DDACTS provide further structure and justification for analysis to drive operations. Those agencies that may be just beginning to utilize data analysis in decision-making will find that the DDACTS Guiding Principles address all necessary factors for the development of an effective process for actionable analysis.

"The addition of accurate crime and crash data analysis has allowed our agency to be proactive in our approach to social harms and helped us to utilize precision policing to address social harm in our community. This has enabled us to be a more focused, efficient and effective provider of law enforcement services to our community."
~ Chief Brett Railey, Winter Park FL Police Department

The availability of existing resources such as trained personnel, data access, data quality, and mapping capabilities will drive the pace of that process. Identification of such resources is a critical first step in DDACTS implementation. Analysis is used to efficiently and effectively allocate resources. Analysis, including mapping, can identify locations of crime and crash overlap, as well as clusters of repeat, routine calls for service that may be a drain on available work force. With the application of appropriate hot spot theory, maps can communicate vital information to law enforcement officials and community members.[21]

Action Items

- Establish parameters for the scope and capacity of the data analysis function.
- Articulate and describe analytical products that will be actionable and valuable to commanders, supervisors and street level personnel as well as community partners and stakeholders.

[21] Eck, J. E., Chainey, S., Cameron, J. G., Leitner, M., & Wilson, R. E. (2005, August). *Mapping crime: Understanding hot spots* (NCJ Publication No. 209393). Washington, DC: Office of Justice Programs, National Institute of Justice.

- Identify personnel to be assigned the analysis responsibilities. Utilize outside support if necessary.
- Perform analysis to identify and map hot spots.
- Perform analysis of causation and temporal factors and environmental influences.
- Consider the use of non-traditional data and identify further data needs.
- Consider the role that displacement and diffusion might have on crime reduction and traffic activities.[22]
- Use historical data as a means to evaluate the impact and effectiveness of DDACTS and overall operations.

Considerations

- Analysis will lead to the identification of locations where enforcement can achieve an impact in the reduction of crime, crashes, and social harm. Such results will, in turn, create buy-in and lead to a cycle of success within the agency and within the community.
- Data quality and accuracy of analysis must always be primary considerations at all times.
- Access to enforcement data such as arrests, citations, summonses, warnings, and field contacts can allow for the analysis and mapping of enforcement in relation to incidents with the intent to align enforcement activity with desired outcomes.
- Many groups will be interested in the results of the data analysis. Be clear about who will have access to what information and how it will be presented.

Key Element II - Develop Reporting Procedures

The findings from the data analysis are an important tool for garnering internal and external support for DDACTS implementation within identified hot spots. In addition to encouraging officer buy-in, findings from the data analysis can be used to inform government officials, community members, and the media about progress, challenges, and expectations for crime reduction and traffic safety improvements.

Action Items

- Determine to whom and how analytical reports and products will be distributed so that the information will be best utilized.
- Consider various formats for analysis.
- Distinguish between internal and external analysis needs.
- Develop a reporting schedule.
- Ensure accuracy and transparency of information prepared for distribution.
- Develop a review process for all information prepared for external use.

[22] Guerette, R. T. (2009, June). *Analyzing displacement and diffusion. (*Tools Series, Guide No. 10)., Washington, DC: Office of Community Oriented Policing Services, U.S. Department of Justice.

Guiding Principle IV-Strategic Operations

DDACTS is designed to provide accurate and timely analysis to identify hot spots and an unbiased basis for making strategic and tactical decisions. Based on the objective findings of the data analysis, agencies can identify a mix of highly visible traffic enforcement tactics. Data analysis also guides the realignment of workflow and operational assignments to help pin point the focus of traffic and crime enforcement efforts, thus increasing efficiency. Law enforcement executives must take strong leadership roles to successfully integrate DDACTS into routine operations. In these roles, they should be prepared to:

- Promote the effectiveness and efficiency of highly visible traffic enforcement as a core operational element for reducing crashes and crime;
- Review agency policies, goals, and objectives to ensure that they support the use of highly visible traffic enforcement specifically within designated hot spots;
- Commit appropriate time and resources to the implementation of the model;
- Reallocate resources to purchase needed equipment to support traffic enforcement (e.g., speed-measuring devices, portable breath test devices, license plate readers);
- Discuss possible pushback and lack of buy-in from officers concerning increased traffic enforcement;
- Offer them thoughtful justification for effective strategies and tactics and present them with analysis in support of DDACTS implementation;
- Conduct training in the DDACTS philosophy and Guiding Principles;
- Demonstrate flexibility and creativity to address possible negative reactions from the community to highly visible traffic enforcement;
- Make adjustments to field and internal procedures as appropriate; and
- Promote teamwork among staff focusing on reducing crashes and crime.

For additional information on strategic operations, see IACP. (2003, August). *Traffic safety strategies for law enforcement: A planning guide for law enforcement executives, administrators and managers,* and Braga, A. A. (2008). *Police enforcement strategies to prevent crime in hot spot areas;* listed in Appendix A, reference section.

Key Element I - Identify Strategies and Tactics

The types of crashes, crime and traffic safety issues identified through the data analyses will dictate the selection of enforcement strategies and tactics. During this process, agencies may need to consider the procurement of additional equipment, provision of additional training, and the reallocation of personnel necessary for specific enforcement. Creating patrol time and/or combating the perception that no patrol time is available for a DDACTS initiative can be problematic. Analysis of available patrol hours and an objective examination of documented unobligated time is highly recommended. As appropriate, staff should include partners and stakeholders in discussions on enforcement measures.

Action Items

- Identify all traffic and crime enforcement activities currently underway in the hot spots to counter any overlapping or interference of effort and/or resource allocation.
- Develop a preliminary list of proposed traffic enforcement measures.
- Make projections on the effect that increased traffic enforcement may have on traffic safety and crime reduction. Develop interim goals supporting these projections and measures.
- Identify equipment, training, personnel, and other needs associated with the selected countermeasures.
- Measure actual unobligated patrol time that could be made available for DDACTS enforcement.
- Obtain input from partners and stakeholders.

"Using highly visible enforcement in areas where the incidences of traffic crashes and crimes overlap is a more efficient use of resources than trying to address both issues independently. We know that visible traffic enforcement can change driving behavior while, simultaneously, creating an environment that is uncomfortable for criminals. This is purpose-driven enforcement that leads to results."
~ Chief Howard Hall, Roanoke County, Virginia Police Department

Considerations

- Identify the strategies and tactics needed to address the problems in the hot spots.
- Ensure that all discussions on enforcement efforts include staff members who are engaged in implementing the strategies.
- Build on the positive experiences of others that have used a mix of highly visible traffic enforcement.
- Review exemplary programs and consult with other law enforcement executives who have used saturation patrols and other highly visible traffic enforcement strategies to improve traffic safety and reduce crime.
- Examine the benefits of investing in existing and new enforcement technologies.
- Consider and address, when appropriate, objections to specific tactics raised by partners and stakeholders.
- Be prepared to counter arguments that available unobligated patrol hours do not exist and proactive DDACTS patrol is not possible.

Key Element II—Develop an Operational Plan

A comprehensive operational plan describes the overall deployment strategy for the hot spot and provides the framework for monitoring, evaluating, and adjusting the strategy. An important component of this strategy is training that addresses the multiple skill sets associated with traffic and crime enforcement. The operational plan might include the following elements.

- Goals and objectives
- Strategic approach to hot spot deployment
    - Traffic enforcement tactics
    - Crime reduction tactics
    - Frequency and timing of countermeasures
    - Multijurisdictional interaction and enforcement

- Personnel requirements
- Training of staff
- Equipment and other resources
- Operational plan implementation
    - Daily enforcement activities
    - Weekly enforcement activities
    - Officer assignments
    - Reporting activities
    - Internal briefings
    - External briefings
    - Debriefings
    - Scheduling
- Budgeting
- Evaluation

Action Items

- Assign writing responsibilities for plan development.
- Gather information necessary for plan development.
- Develop schedule.
- Identify review process.
- Review and finalize the plan.
- Distribute plan.

Considerations

- Law enforcement executives need to identify goals and objectives that address the impact of DDACTS on overall operations, as well as the impact on improving traffic safety and reducing crime in hot spots.
- Operational categories for plan development can include impact on personnel assignments and scheduling, staff performance, expenditures, and accountability.
- Other agencies that have jurisdiction in the hot spot should be involved in plan development.
- Incorporate cost-benefit criteria when developing the operational plan.
- Include projected available unobligated patrol hours available for a DDACTS initiative.

Key Element III—Implement Plan

A number of administrative, environmental and community related factors may influence the best time to start highly visible traffic enforcement. In addition to considering these factors, law enforcement executives should allow time for informing staff, partners, and stakeholders, formally and informally, about the timing of plan implementation.

Action Items

- Set up formal meetings and briefings, before plan implementation, to prepare staff for changes.
- Hold a formal briefing for all staff to announce the start of DDACTS.

- Work with partners, stakeholders, and media to develop awareness.
- Ensure staff members understand the importance of communicating the appropriate message during every citizen contact.

Considerations

- All staff should be kept informed throughout DDACTS implementation.
- A formal announcement and media outreach addressing the startup of DDACTS traffic enforcement is vital to the success of plan implementation.
- Launching the initiative with a formal announcement and media event will demonstrate respect for the community and promote collaboration with partners and stakeholders.

Guiding Principle V - Information Sharing and Outreach

Information sharing and outreach reflects the community-based nature of DDACTS, in which law enforcement agencies not only share progress but also rely upon feedback from community members and other partners and stakeholders. Throughout the communications process, law enforcement agencies should include messages that reinforce the objective nature of DDACTS. This objective process allows law enforcement agencies to use data to identify hot spots and provide an unbiased basis for making strategic and tactical decisions. Communicating this information to partners and stakeholders will increase understanding and support for DDACTS.

For additional information on information sharing and working with the media, see NHTSA. (undated). *Guidelines for developing a municipal speed enforcement program,* listed in Appendix A, reference section.

Key Element I - Review Partner and Stakeholder Plan to Identify Tactics for Information Sharing and Outreach

Regularly generated analytical products give management documentation needed to keep staff informed, hold meetings with community members, and report to government administrators and elected officials. Regular evaluation also provides the basis for ongoing media relations.

Many factors can affect the implementation of DDACTS and law enforcement executives must be prepared to address challenges as well as successes. Therefore, communications strategies should be based on the goals and objectives identified with the partners and stakeholders involvement.

Action Items

- Review partner and stakeholder participation plan to identify roles in outreach activities.
- Based on roles, identify tactics for sharing and gathering information.
- Identify tools for communicating with partners and stakeholders.
- Assign staff responsibilities for coordinating the preparation of outreach materials and conducting information-sharing sessions.

Considerations

- Meet with appropriate staff to determine what information is suitable for sharing with partners and stakeholders and the timing of its availability.
- Consider monitoring staff expectations to ensure continual buy-in.
- Identify information milestones and timeframes for information sharing.
- Identify opportunities for partners and stakeholders to participate in internal briefing sessions.

"The timely and accurate sharing of information, both internally and externally is critical to the success of the DDACTS model. In order to effectively resolve crime and traffic safety concerns and prevent them from reoccurring, police personnel must be aware of and have immediate access to information that describes when and where those incidents are taking place. The business owners, residents, and other stakeholders of an area adversely impacted by these issues need to know about what's occurring and the initiatives law enforcement is undertaking to address them. By communicating openly and sharing information, police resources are utilized more efficiently, and community members are presented with a better understanding of what their law enforcement agency is focused on, and why. This can lead to community buy-in and support of the law enforcement agencies objectives."
~ Chief Keith Ternes, Fargo, North Dakota Police Department

Key Element II—Develop a Plan for Communicating Through Media Outlets

Informing the public regarding traffic enforcement and crime reduction activities and the resulting impact of DDACTS is crucial to long-term success. Working with data analysts and designated staff, the agency's public information officer or spokesperson should develop a plan for communicating through media outlets to share information about the DDACTS initiative.

Action Items

- Develop a communications plan for working with the media that includes background information, key events, and milestones that warrant publicity.
- Develop accurate, consistent messages delineating the goals, objectives, elements, and results of DDACTS.
- Identify general and audience-specific media outlets that reach all designated audiences.

Considerations

- Develop background information for the media that describes DDACTS; emphasizes the deterrent effect of highly visible traffic enforcement; and includes a list of partners, stakeholders, and other supporters of the initiative.

- Be prepared to address traffic safety issues, along with issues pertaining to possible, perceived, or the actual displacement of crime.
- Make sure to communicate successes in crime suppression.
- Include DDACTS information for the public on the agency's web site.

Guiding Principle VI—Monitoring, Evaluation and Adjustments

Law enforcement executives should monitor the effectiveness of traffic enforcement and the impact on crashes, crime, and social harm. The goal should be to align enforcement with incidents in order to achieve identified, desired outcomes. Strategic operations can only be evaluated, and adjusted accordingly, if data is available to monitor the impact of enforcement.

Regular evaluation of arrests, citations, citizen contacts and all other enforcement activity allows for adjustments to the mix of traffic enforcement measures and the deployment of officers. In addition, scheduled briefings keep executives aware of officers' performance and concerns. The accountability of first line supervisors is critical. First line supervisors must be given the authority to manage, and then be held accountable for the effort displayed by patrol officers.

Law enforcement executives also will have the opportunity to assess the impact that highly visible traffic enforcement has on the performance of other law enforcement activities—non-traffic-related arrests, processing arrested individuals, filing reports, making court appearances. This information will contribute to decisions about the reallocation of resources and the deployment of officers who investigate crime.

For additional information on monitoring and evaluating, see Clark, R. V., et al. (2005, August). *Crime analysis for problem solvers in 60 small steps*, listed in Appendix A, reference section.

Key Element I—Use Data and Other Information to Make Adjustments to DDACTS Field Operations

The intervals and duration of enforcement may determine the timing of data analysis and reporting. Staff feedback, along with information obtained from partners and stakeholders may be summarized in daily, weekly, monthly, or as needed reports.

Action Items

- Develop a schedule for analysis, allowing for feedback from staff, partners, and stakeholders.
- Meet with analysts and staff to discuss findings.
- Make appropriate adjustments.

Considerations

- Be aware of displacement and diffusion as factors that can contribute to crime reduction; make adjustments to account for each.

- Based on the data analysis, adjust highly visible presence and enforcement in response to increases and decreases in crimes and crashes.
- Examine the need for additional training.
- Compare staff efficiency and focus before and after implementation of DDACTS.
- Maintain contact with appropriate criminal justice officials regarding the effect that increased traffic enforcement has on their processes.

Key Element II—Document and Report Changes

Documenting changes and adjustments to all aspects of DDACTS will increase the potential for long-term success. As analysis and analytical products adapt and change in relation to changing and expanding operations, it is important to maintain accuracy, timeliness, and consistency in analysis. It is important that everyone understand what is being measured and evaluated and that success and/or failure of operations be true, accurate and statistically significant so that operations can be adjusted accordingly. These changes and adjustments might pertain to:

- Additions or deletions of data sources;
- Changes in mapping techniques;
- Expansion of data analysis;
- Benefits/challenges associated with use of nontraditional data sources;
- Benefits/challenges of working with various partners and stakeholders;
- Equipment purchases;
- Reallocation of resources and staff;
- Staff training;
- Administrative duties; and
- Expenditures and budget reallocations.

"It is imperative that current and historical data be reviewed on a continual basis in order to determine the level of success or lack thereof in enhancing the quality of life in known hotspots. As we all know, some geographical locations have historically and will continue to present challenges, however a daily review of crash and crimes will also keep current locations in mind so that resources can be deployed accordingly to combat both historic and newly developed hotspots."
~ Captain Mike Alexander, Specialized Investigations Division, Nashville Metro PD, TN

Action Items

- Review the operational plan to identify areas for measure and evaluation.
- Develop procedures and formats for documenting DDACTS activities and outcomes.
- Assign responsibility for documentation and reporting activities.
- Seek to utilize technology to the greatest extent possible and limit the need for hand-written documentation.

Considerations

- Reports should be accurate, transparent, understandable, timely, and thorough.
- Disseminate reports to appropriate staff, partners, and stakeholders.
- Key partners and stakeholders should review final reports prior to general distribution.

Guiding Principle VII--Outcomes

Inherent in the decision to implement DDACTS is a commitment to changing attitudes and practices regarding crash reduction and prevention, traffic safety and the resulting reduction of crime. To document this change, law enforcement executives should identify desired outcomes that are based upon analysis and are as specific as possible.

> *"We have an ongoing evaluation in place. We track officers' activity in the DDACTS area (arrests, tickets, warnings, contacts, and time on task) weekly. We also do an evaluation of stranger crimes every six months. We compare year to year and compare before/after DDACTS (years prior to DDACTS starting to after DDACTS implementation). Outcomes are shared with Partners and Stakeholders, media, and interdepartmentally." ~ Captain Bill Hisle, Shawnee Kansas Police Department*

Outcome measures or measures of impact that address a reduction in crashes and crime may include, but not be limited to the following:

- The reduction in calls for service;
- Individual and collective numbers of fatal, injury, and property-damage-only crashes;
- Numbers of Part I and Part II crimes;
- Increasing numbers of enforcement contacts for specific driving offenses; and
- Reduction in gang violence incidents.

Administrative outcomes may include more effective and efficient utilization of work force and other resources. Additional outcomes may include:

- Increase in personnel and equipment.
- Increased cooperation and coordination among all officers, working together toward the identified desired outcomes.
- Community support

Action Items

- Identify areas for monitoring and evaluation.
- Develop outcome measures.
- Identify monitoring and evaluation methods.
- Assign responsibility for monitoring and evaluation.

Considerations

- Include staff in the development of outcome measures.
- Look for ways to apply the findings from hot spot analysis to deployment decisions in other locations.
- Monitor relationships with partners and stakeholders from the hot spot location to obtain insights on ways to improve community relations in other hot spots.
- Incorporate cost-benefit criteria when measuring outcomes.

NATIONAL SUPPORT FOR DDACTS

As leaders of this national initiative to improve the quality of life in local communities, NHTSA, BJA, and NIJ are fortunate to have support from a number of national partners. The following organizations will offer technical assistance and in-kind resources through their local affiliates to support law enforcement agencies that undertake DDACTS initiatives:

- American Probation and Parole Association;
- Commission on Accreditation for Law Enforcement Agencies;
- Federal Highway Administration;
- Federal Motor Carrier Safety Administration;
- Governors Highway Safety Association;
- International Association of Chiefs of Police;
- International Association of Crime Analysts;
- International Association of Directors of Law Enforcement Standards and Training;
- National Criminal Justice Association;
- National District Attorneys Association;
- National Liquor Law Enforcement Association;
- National Organization of Black Law Enforcement Executives; and
- National Sheriffs' Association.

NHTSA, BJA, NIJ, and their partners are prepared to facilitate the provision of technical assistance teams to work with local law enforcement agencies on various aspects of DDACTS. They also will serve as intermediaries for identifying local partnerships and obtaining technical assistance from local affiliates and State agencies.

Appendix A
REFERENCES / RESOURCES

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Appendix B
GLOSSARY OF SELECTED TERMS

Baseline data – Basic information gathered before a program begins. It is used later to provide a comparison for assessing program impact. Three years of baseline data is recommended, particularly for crash incidence.

Crime*Stat* -A spatial statistics program for the analysis of crime incident locations, funded by grants from the National Institute of Justice. Retrieved December 18, 2012 from www.nedlevine.com/nedlevine17.htm

Data-Driven Approaches to Crime *and* Traffic Safety (DDACTS) National Initiative – A joint effort of NHTSA, BJA, NIJ, and partner organizations to encourage law enforcement agencies to implement a business model that uses highly visible traffic enforcement strategies to fight crime and reduce crashes at the local level by using geo-mapping techniques to identify hot spot areas, which support enhanced resource allocation. The initiative encourages using the full range of traditional and non-traditional partners to increase effectiveness.

Deconfliction – The process of avoiding conflicts in investigative and operational programs. Often, investigative efforts such as undercover operations create the potential for conflict between agencies, which are unknowingly working in close proximity to each other, or may be coordinating an event on the same suspect at the same time. In either case, agencies may interfere with each other's cases, causing investigative efforts to be disrupted or, worse, officers to be unintentionally hurt or killed. Deconfliction databases such as the RISS Officer Safety Website serves as a nationwide repository for issues related to officer safety to avoid problems and further information is available at www.riss.net/Resources/RISSafe.

Diffusion - The opposite of crime displacement is diffusion of crime control benefits. Crime diffusion entails the reduction of crime (or other improvements) in areas or ways that are related to the targeted crime prevention efforts, but not targeted by the response itself. Diffusion is recorded in many research evaluations of crime prevention responses that have impact on geographic areas and crime statistics outside the targeted area in which improvements were gained without expending resources in those areas.[23]

Displacement – Displacement of crime refers to changes in crime patterns that occur because offenders adapt their behavior as a result of some change in opportunities for offending. www.weedandseed.info/docs/studies_other/displacement-final-report.pdf

Evidence-Based Policing - Evidence-based policing is the use of the best available research on the outcomes of police work to implement guidelines and evaluate agencies, units, and officers. Put more simply, evidence-based policing uses research to guide practice and evaluate practitioners. It uses the best evidence to shape the best practice. www.policefoundation.org/content/evidence-based-policing

Erosion – A natural decrease in criminal activity and traffic crashes as a result of displacement and/or diffusion.

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[23] Guerette. (2009).

Geo-mapping – The location-based tracking of an event or incident, most often using some type of computerized geographic information system.

Highly visible enforcement – The use of sustained and focused traffic enforcement strategies to fight crime and reduce crashes and traffic violations.

Hot Spot - A geographical area identified through data analysis that has a distinguishing concentration of crime, crash, and safety problems.

Intelligence-Led Policing – Intelligence-led policing is a business model and managerial philosophy where data analysis and crime intelligence are pivotal to an objective, decision-making framework that facilitates crime and problem reduction, disruption and prevention through both strategic management and effective enforcement strategies that target prolific and serious offenders. http://jratcliffe.net/research/ilp.htm

Kernel Density Estimation (KDE) technique – A spatial analysis method that creates a smooth surface of the variation in the density of point events across an area.

Nearest Neighbor Hierarchical Clustering – A spatial analysis method that uses a technique to identify groups of a minimum number of user-defined points. The technique identifies only those points that are closer than expected under spatial randomness.

Nontraditional data – Data not normally used to track traffic or criminal activity. Non-traditional data is somewhat of a catchall term for anything else besides CAD and RMS data. Some examples might be census bureau data, public health, emergency care specifically related to shootings, drugs and other crimes, utilities, property and assessor-type data related to vacant and/or foreclosed properties, zoning, very specific traffic engineering or roadway use data, income levels and property values, etc. Although there are frequent references and suggestions about the use of non-traditional data, it can be very complicated and fraught with issues. The analyst has to be sure of the quality and availability of the data, as well as access to the data.

Person-based policing – An approach to crime reduction that focuses on individuals who commit crimes or engage in unsafe driving behaviors as a means for deploying resources.

Place-based policing – An approach to crime and crash reduction that focuses on places where crime and crashes occur as a means for deploying resources.

Shared system – A system designed for use by more than one agency (e.g., 911 dispatch).

Social harm – An approach to community issues that should encompass physical harm, financial/economic harm, emotional/psychological harm, and cultural safety.

Appendix C

A Framework for Mapping Technology Implementation

A general framework should be implemented to identify crash and crime hot spots. As the primary focus of DDACTS is to examine the relationship between crashes and crimes, the use of spatial statistical techniques to identify clusters of each is needed to provide firm evidence that both are occurring together in the same places, and at the same times. Through this unique identification of crash and crime hot spots, high-visibility enforcement countermeasures can be focused to more efficiently affect crime and crashes together. Spatial statistical techniques can also be applied to identify areas that are hot spots of crashes but not of crimes, and areas that are hot spots of crimes but not of crashes, so that appropriate countermeasures may be taken. The following is a general method for locating high concentrations of crimes and crashes:

1. Analyze relatively small geographical areas, but not pinpoint locations. There are two reasons for this. First, exact locations will rarely coincide, due to the fact that most crashes occur on roads whereas most crimes occur off the roads, either on sidewalks or within a property boundary (parcel). Second, common factors are liable to involve the interaction between the road system and the land uses they traverse. The analysis unit should be as small as possible such as a block group, traffic analysis zone, police beat, or some other administrative unit. The preferred unit would be the block group. This will allow some degree of correlation to be observed between crashes and crimes given they do not happen in the exact same space.

2. Use three years of baseline data to account for high annual variations in crash frequencies (Nicholson, 1985[24], 1986[25]). In fact, it is common (if not required) in crash analysis to require three years of data as a basis for allocating Federal safety funds.

3. Determine if a simple correlation exists between crashes and crimes at a given location. Please note a simple correlation may be a poor indicator of coincidence because both crashes and crimes are highly clustered. In most locations, there may be no relationship between the two types of events. However, in key locations, the relationship should be very strong.

4. Analyze correlations by time of day. Many hot spots are temporally bound. For example, many crashes occur in the afternoon and early evening. Thus, many crash hot spots would have a periodicity. Likewise, driving while impaired crashes tend to occur at night and their crash hot spots also would tend to occur during similar intervals. For crimes, burglaries occur mostly in the afternoon while auto thefts and robberies occur mostly in the evening. Without analyzing crashes and crimes by time of day, inaccurate associations may occur.

5. Conduct spatial analyses to determine:

    a. *The degree of global spatial autocorrelation*. Often, crime is more concentrated than crashes, though both are highly concentrated relative to the population distribution. Crashes tend to correlate with the distribution of employment whereas crimes tend to correlate with the interaction of employment and lower income levels. It must be

[24] Nicholson, A. J. (1985). The variability of accident counts. *Accident Analysis and Prevention*. *17*(1), 47-56.
[25] Nicholson, A. J. (1986). The randomness of accident counts. *Accident Analysis and Prevention*. *18*(3), 193-198.

recognized that there is only limited overlap between crime and crashes. DDACTS primary focus is in those locations where there is substantial overlap.

b. *A visualization of the concentration of events using a Kernel Density Estimation technique*. A fixed bandwidth (standard search distance) should be used to identify clusters of crimes and crashes. This allows for the scale of identified clusters to be consistent for comparative purposes. The distance should be relatively small due to crashes being confined to a street network and will allow a high-visibility intervention program to be implemented in more precise areas.

   Ripley's K in *CrimeStat*[26] can be used to identify the fixed distance to be specified. It should be used for all crime types and crashes and the average distance between a crime type and crashes will become the fixed distance to use. In terms of the mathematical function, a quartic function is commonly used, as it is more compact and will consider only those observations that fall within the specified fixed distance for clustering. Given that, the size of the bandwidth will be small, and likely non-normal, it provides a distance decay weighting that falls off systematically in calculating estimates that are more uniform under the kernel.

c. *Independently determine specific hot spots for crashes and correlated crime types.* There are a number of techniques for identifying these, but it is recommended that the Nearest Neighbor Hierarchical Clustering (NNHC) routine in *CrimeStat* be used. NNHC identifies clusters of incidents that are closer together than random chance. There are two types of geographic outputs from the NNHC technique, which are standard deviational ellipses (SDE) and convex hulls. The convex hulls should be used for comparison between the crime types and crashes, as they are more precise as to the true geographic distribution than the SDEs. This should be done by time of day based on the prevalence of a crime type and specific crash types.

   Once identified each of the results from the crime and crash incidents should be overlaid and then ranked for priority for the intervention.

d. *Risk-adjusted hot spots data is available for use*. Crime hot spots typically occur where the greatest concentration of people occurs, usually in commercial areas (and where employment can be used as a rough estimate of this). Crash hot spots tend to occur where traffic volumes are highest. In order to control for the underlying number of persons who could be exposed to these events, it is preferable to analyze the incidents relative to a baseline of exposure. For crashes, the analysis is the number of crashes relative to vehicle miles traveled, usually in terms of 10 million vehicle miles traveled, (VMT); while for crimes, the analysis is the number of crimes relative to employment (or population). There are two ways to conduct a risk-adjusted clustering. One is through a dual kernel density interpolation that assigns crashes or crimes to small grid cells and then includes vehicle miles traveled (VMT) or employment. The second is to conduct risk analysis through the risk-adjusted nearest neighbor hierarchical clustering routine (NNHC) in *CrimeStat*; this routine conducts a nearest neighbor hierarchical clustering (NNHC) but relative to the baseline variable, VMT and employment/population respectively.

[26] Levine, N. (2010).

e. The identification of hot spots of crashes and crime types that overlap using this technique will provide stronger evidence for the coinciding of the two, as they will have been adjusted for a factor they are associated with. However, this data can be difficult to obtain and at a scale that allows it to be used.

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For information about DDACTS, including the DDACTS toolkit, please visit www.nhtsa.gov/ddacts.

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