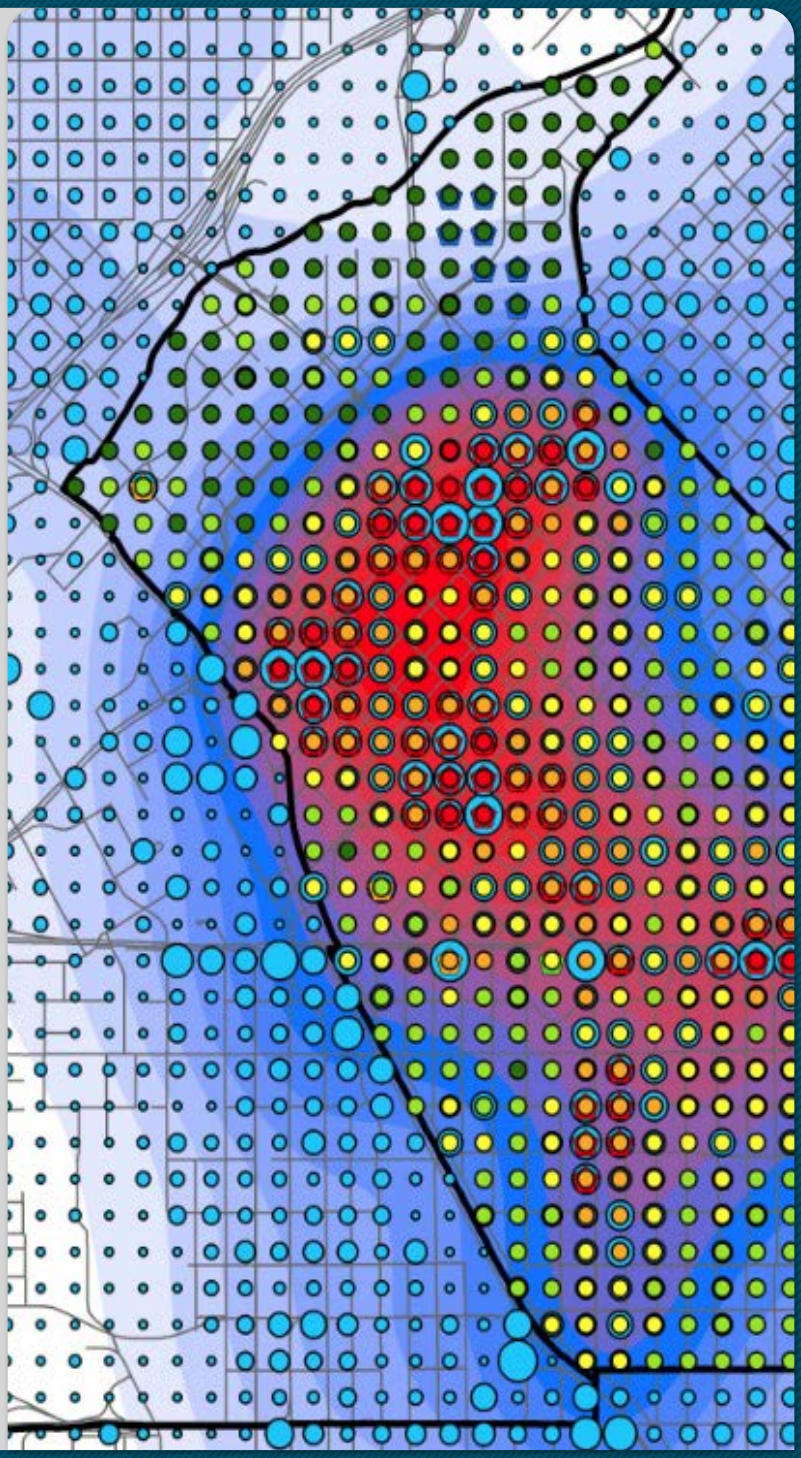
AUDIT REPORT
Denver Police Department
Data Driven Approaches to Crime and Traffic Safety Model



Office of the Auditor
Audit Services Division
City and County of Denver

Timothy M. O'Brien, CPA
Denver Auditor

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June 15, 2017

AUDITOR'S REPORT

We have completed an audit of Denver Police Department's Data Driven Approaches to Crime and Traffic Safety (DDACTS). The objective of the audit was to assess the Denver Police Department's (DPD's) design, implementation, and evaluation of its Data Driven Approaches to Crime and Traffic Safety (DDACTS) model. We evaluated how DDACTS aligns with DPD's departmental mission, vision, and strategies, and to what extent DPD's DDACTS model conforms with the DDACTS Operational Guidelines and leading practices.

As described in the attached report, our audit revealed that DPD is not fully committed to the DDACTS model due to prioritizing short-term crime prevention initiatives and 911 calls. DPD's leadership needs to decide whether they want to continue using this model to improve public safety and, if so, how the model aligns with the Department's other data driven policing initiatives. If DPD decides to continue using this model, we recommend several improvements, most significantly to the model's implementation and evaluation.

Through stronger DDACTS planning, leadership, training, communication, monitoring, and evaluation, DPD will be better positioned to ensure officer buy-in, cooperation with stakeholders, and increased overall effectiveness of the model.

This performance audit is authorized pursuant to the City and County of Denver Charter, Article V, Part 2, Section 1, *General Powers and Duties of Auditor*, and was conducted in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

We extend appreciation to the Denver Police Department, especially its Data Analysis Unit, and all the personnel who assisted and cooperated with us during the audit.

Denver Auditor's Office

Timothy M. O'Brien, CPA
Auditor

Denver Police Department
Data Driven Approaches to Crime and Traffic Safety Model

June 2017

Objective

The objective of the audit was to evaluate the Denver Police Department's (DPD's) design, implementation, and evaluation of the Data Driven Approaches to Crime and Traffic Safety (DDACTS) model to reduce social harm within the City and County of Denver for the years 2013 through April 2017.

Background

DDACTS is a nationally recognized operational model, which recommends performing data analysis to identify areas and times where crime and traffic accidents significantly overlap. DPD calls these areas DDACTS zones. The DDACTS model recommends high visibility enforcement activities in these zones during identified times with the help of partners and stakeholders. The DDACTS Operational Guidelines recommend adopting seven principles for the model's implementation: partner and stakeholder participation; data collection; data analysis; strategic operations; information sharing and outreach; monitoring, evaluation, and adjustments; and outcome measurement.

REPORT HIGHLIGHTS

Highlights

DDACTS is one of several DPD data driven policing initiatives, and was piloted in two districts in 2013. The model was then implemented Citywide in May 2015. DPD's Data Analysis Unit (DAU) is responsible for the design of the DDACTS zones and times for six of DPD's seven districts. The DAU is also tasked with evaluating the model's effectiveness. The district commanders are responsible for the model's execution in their respective districts.

In our assessment of DPD's application of the DDACTS Operational Guidelines and leading practices, we found assurance that DPD and the DAU use some advanced technologies and data analysis techniques. However, we identified four issues regarding the design, implementation, and evaluation of the DDACTS model.

1. DPD has not fully incorporated the DDACTS model into the department's strategic plans. Additionally, DPD has not identified objectives and performance measures or established clear roles and responsibilities for implementing DDACTS.
2. Although we found that the DAU's analyses for DDACTS zone and time design were largely in alignment with the DDACTS Operational Guidelines, the DAU could conduct additional analysis to refine the number and size of DDACTS zones and identify the types of crimes within each zone.
3. The districts did not prepare DDACTS specific strategic, tactical, or operational plans. DPD did not identify partners and stakeholders, did not prepare periodic reports, and did not adequately train its officers regarding the DDACTS initiative.
4. DPD did not sufficiently monitor its DDACTS efforts. The annual evaluation prepared in 2016 was based in part on data not collected for evaluative purposes and did not include sufficient information and analyses.

Based on these issues, we conclude that the DDACTS model's potential benefits for the City may have not been fully realized. DPD leadership should determine whether the Department will continue using DDACTS as a model for resource allocation. If DPD decides to continue pursuing the model, they should adjust its implementation based on the Operational Guidelines and leading practices.

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BACKGROUND

Denver Police Department Overview

The City and County of Denver's (City's) Department of Public Safety comprises three public safety functions: the Denver Police Department (DPD), the Denver Fire Department, and the Denver Sheriff Department. DPD's responsibilities are carried out by two bureaus: The Operations Bureau and the Administration Bureau. The Operations Bureau is responsible for the majority of policing activities, which are carried out in seven districts and supported by the Major Crimes Division, Investigative Support Division, Special Operations Division, and Forensics and Evidence Division.[1,2] The Administration Bureau is responsible for various administrative functions and operations support. The Bureau is made up of several divisions, including the Administrative Management Division, Operations Support Division, Financial Services Section, and Training Division.[3]

Data Analysis Unit

The Data Analysis Unit (DAU) compiles, analyzes, and interprets data collected by DPD and other sources to inform DPD strategies and operations. The DAU is part of the Operations Support Division within the Administration Bureau and is supported by 17 analysts. Five of the analysts prepare Citywide and strategically focused analyses for DPD. Another five Specialty Unit Crime analysts focus on certain areas of crime, such as robbery or narcotics. Each of the six District Crime Analysts are housed within the district stations and provide district commanders and officers with day-to-day analytical support. The DAU also supports one of DPD's data-driven policing initiatives, Data-Driven Approaches to Crime and Traffic Safety (DDACTS).

The district and specialty crime analysts were centralized under the supervision of the DAU in the fall of 2016. The purpose of this reorganization was to facilitate more consistent data analyses, information sharing, and improve efficiencies.

Administration and Origins of the DDACTS Model

Data-Driven Approaches to Crime and Traffic Safety (DDACTS) is a law enforcement operational model that uses the locations and times of crimes, traffic accidents, and other enforcement data to determine where and when to deploy law enforcement resources. DDACTS is supported by the U.S. Department of Transportation's National Highway Traffic Safety Administration (NHTSA) and two agencies of the Department of Justice: The Bureau of Justice Assistance (BJA) and the National Institute of Justice (NIJ).[4,5] The International Association of Directors of Law

[1] Although DPD has seven districts, they only include six on their organizational chart. District 7 covers Denver International Airport (DIA) and does not apply the Data Driven Approaches to Crime and Safety (DDACTS) model. Thus, this district was scoped out of this audit.

[2] See Appendix A for a map of DPD's districts.

[3] For more information on DPD's organizational structure, please refer to Appendix B.

[4] U.S. Department of Transportation, National Highway Traffic Safety Administration, *Data Driven Approaches to Crime and Traffic Safety (DDACTS): Operational Guidelines,* Report No. DOT HS 811 185, (Washington, DC, 2014), ii.

[5] NHTSA spearheads innovative research and data analysis critical to motor vehicle and highway safety. Its mission is to "save lives, prevent injuries, and reduce economic costs due to traffic accidents through education, research, safety standards, and enforcement activity." National Highway Traffic Safety Administration, accessed April 1, 2017, https://www.nhtsa.gov/about-nhtsa/nhtsas-core-values. NIJ is the research, development, and evaluation agency of the U.S. Department of Justice. It is "dedicated to improving knowledge and understanding of crime and justice issues through science." National Institute of Justice, accessed April 1, 2017, https://www.nij.gov/about/Pages/welcome.aspx. BJA's mission is "to provide leadership and

Enforcement Standards and Training (IADLEST) manages the DDACTS program and provides training and guidelines to police departments on its implementation.[6]

DDACTS was officially launched in 2008 when the NHTSA selected seven municipal and county law enforcement agencies to implement the DDACTS model. Since this time, the NHTSA, its federal partners, and other national organizations have promoted DDACTS and provided technical assistance and other resources to agencies interested in adopting the DDACTS model. As of 2014, 441 agencies had received DDACTS training or technical assistance.

The DDACTS model is the culmination of four areas of law enforcement research aimed at integrating traffic enforcement into the overall crime control strategies of law enforcement agencies. The research on which DDACTS is based dates back to the 1960s and draws together four research areas: the link between traffic law enforcement and crime, place-based policing vs. person-based policing, the co-location of crime and traffic accidents, and the use of data to direct law enforcement strategies.[7]

Historically, crime and traffic enforcement have had separate, specialized units. Crime control has been treated as a higher priority than traffic safety. However, researchers identified links between crime and traffic accidents. Studies in the mid-1990s found that crime and traffic accidents, both on the state and city level, were often concentrated in the same areas. Researchers hypothesized that the identified co-location of crime and traffic accidents may be explained by overall aggressiveness, a subculture of violence, and a disregard of laws. In addition, substantial evidence was collected by the late 1990s that traffic law enforcement assists crime law enforcement in two ways. First, traffic enforcement can prevent accidents and deter crime in areas with historically high crime rates due to an increase in police visibility. Second, traffic enforcement provides officers an opportunity to catch criminals at-large, further reducing the crime numbers.

Place-based policing is supported by research showing that a small percentage of places account for a substantial amount of crime and calls for service.

Law enforcement studies in the 1980s found that a small percentage of places account for a substantial amount of crime and calls for service. In addition, the studies found that the locations of crime were stable over time. These studies suggested that crime prevention tactics could shift from policing people to policing places. While place-based policing was not new for traffic law enforcement, these findings suggested that place-based policing could be effective for the broader law enforcement community.

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services in grant administration and criminal justice policy development to support local, state, and tribal justice strategies to achieve safer communities." Bureau of Justice Assistance, accessed April 1, 2017, https://www.bja.gov.

[6] IADLEST is an international organization of training managers and executives dedicated to the improvement of public safety personnel. IADLEST serves as the national forum of Peace Officer Standards and Training (POST) agencies, boards, and commissions as well as statewide training academies throughout the U.S.

[7] U.S. Department of Transportation, National Highway Traffic Safety Administration, *DDACTS: An Historical Overview*, by Alexander Weiss, DOT HS 809 689, (Washington, DC, 2013).

Finally, recent improvements in police department data collection through computer-aided dispatch and digital records management systems have allowed police departments to record the location and time of crimes and traffic accidents. Police departments can then use geographic information system (GIS) mapping software to identify areas within their jurisdiction with high concentrations of crimes and traffic accidents. Therefore, DDACTS integrates research findings regarding high-visibility traffic enforcement and co-location of crime and traffic with data collection and analysis techniques, allowing police departments to identify where crimes and traffic accidents are occurring. The DDACTS model suggests that police departments should deploy high-visibility traffic enforcement activities to the areas within their jurisdiction that have a significant overlap in crime and traffic accidents as a tactic to efficiently reduce both types of incidents.[8]

The DDACTS model suggests that law enforcement activities in the areas where crime and traffic accidents overlap allows to efficiently reduce both crime and traffic accidents.

A major concern related to place-based policing tactics like DDACTS is crime displacement. Crime displacement occurs when offenders may relocate to commit crime in areas where there are no focused policing efforts or a more suitable environment exists for committing a crime. Several studies have found that place-based policing does not displace crime and even positively affects nearby areas.[9] However, the risk remains valid as efforts taken with the DDACTS model vary among police departments and numerous variables affect crime.[10]

Key Goals and Principles of the DDACTS Model

The NHTSA summarizes the purpose of the DDACTS model as follows: "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."[11] For a visual depiction of the key mechanisms and desired outcomes of the DDACTS model, the Urban Institute developed the logic model displayed in Figure 1.[12,13]

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[8] According to the NHTSA, a high-visibility enforcement operation is a law enforcement effort that is highly visible to the public and well publicized. (https://one.nhtsa.gov/About-NHTSA/Highway-Safety-Grant-Programs/Resources-Guide/Highway_Safety_Glossary). Based on our review of literature and interviews with subject matter experts, we found that high-visibility traffic enforcement includes making contacts with citizens, issuing warnings or citations, preferably with many officers saturating an area. The operation should also be publicized to amplify visibility.

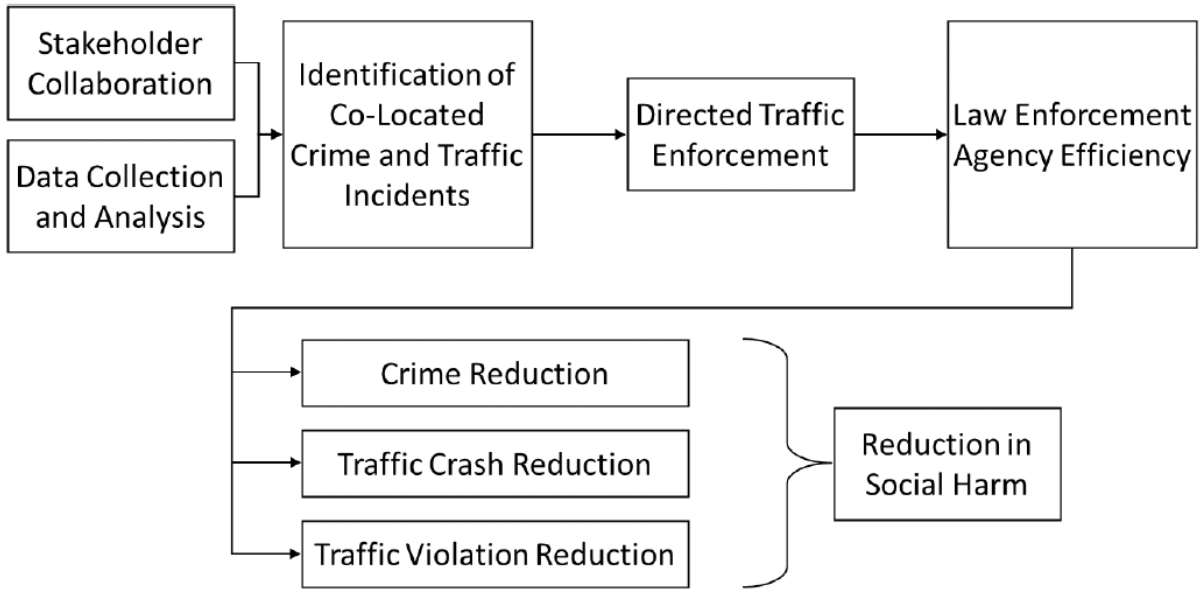
[9] One of the explanations for the limited displacement is that criminals tend to focus their criminal activities on certain areas. However, when an area is heavily policed, criminals may feel uncomfortable to expand their activities into unknown areas and are more likely to be apprehended in these new areas. Robert E. Worden and Sarah J. McLean, *DDACTS in Theory and Practice* (The John F. Finn Institute for Public Safety, Inc., 2009), 4-5.

[10] For a detailed review of research supporting DDACTS model see: Robert E. Worden and Sarah J. McLean, *DDACTS in Theory and Practice* (The John F. Finn Institute for Public Safety, Inc., 2009); Alexander Weiss, *DDACTS: An Historical Overview* (International Association of Directors of Law Enforcement Standards and Training, 2013); and *Data-Driven Approaches to Crime and Traffic Safety (DDACTS) Operational Guidelines* (National Highway Traffic Safety Administration, 2014).

[11] U.S. Department of Transportation, National Highway Traffic Safety Administration, *Data Driven Approaches to Crime and Traffic Safety (DDACTS): Operational Guidelines*, Report No. DOT HS 811 185, (Washington, DC, 2014), ii.

[12] Founded in 1968, the Urban Institute is a non-profit organization which provides objective analysis and offers actionable solutions to a variety of policy debates on different government levels. It has over 400 employees who prepare over 300 research publications per year. Accessed November 11, 2016, http://www.urban.org/about/our-history.

FIGURE 1. DDACTS logic model



Source: *DDACTS Evaluability Assessment: Final Report on Individual and Cross-Site Findings* (Urban Institute: Justice Policy Center for the U.S. Department of Justice, 2014), ii.

Note: Although this model only includes traffic enforcement, DDACTS can also encompass other tactics to target specific crimes in the DDACTS areas. In addition, traffic violation reduction is difficult to measure as violation counts are typically driven by the presence of enforcement efforts in the area.

Aside from the main goal of improving public safety through reduction of crime and traffic accidents, the following additional DDACTS implementation benefits have been observed:[14]

- Attending to traffic accidents is a resource-intensive policing activity. When accidents are prevented, officers have more time to focus on crime prevention.
- Focusing policing efforts in an area of high crime and traffic accidents based on data analysis is significantly less likely to result in biased policing than person-based policing strategies.
- Implementing the DDACTS model is a starting point for achieving long-term change where:

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[13] Outcome is defined as a "result of program efforts and resource expenditures;" expected or actual result of activities. Examples for law enforcement include a reduction in number of crimes, decrease in number of 911 calls, survey results showing increased perception of personal safety. Performance Measurement, Benchmarking, and Outcome Based Budgeting for Wisconsin Local Government (University of Wisconsin Local Government Center: 2009), 13, accessed May 31, 2017, http://www.focusintl.com/RBM133-Performance%20Measurement%20manual%20Volume%20II.pdf.

[14] These additional observed benefits were cited by DPD employees, subject matter experts, the DDACTS Evaluability Assessment, and the Operational Guidelines. *DDACTS Evaluability Assessment: Final Report on Individual and Cross-Site Findings,* Urban Institute: Justice Policy Center for the U.S. Department of Justice, 2014), 27,15; National Highway Traffic Safety Administration, *Data Driven Approaches to Crime and Traffic Safety (DDACTS): Operational Guidelines*, Report No. DOT HS 811 185, (Washington, DC, 2014), 17.

- Data is analyzed for resource allocation;
- Officers can better understand local issues and areas of focus when provided with collective experiences of officers working different shifts in the same area; and
- Communication and cooperation improves internally between the shifts and various units within a police department.

A foundation of place-based policing like DDACTS is that the physical environment (e.g. lighting, business make-up, and neighborhood characteristics) contributes to the likelihood of crime being committed in an area. DDACTS and other policing activities in the area aim to reduce crime through arrests and deterrence.[15] A police department may also cooperate with partners and stakeholders to impact the physical environment (e.g. build a fence, improve lighting, change business hours, change intersection signs or maximum speed) to make the area less attractive to criminals or less prone to accidents. Not all crime can be affected by high visibility traffic enforcement, which is the primary recommended tactic in DDACTS. Therefore, police departments typically have other strategies and tactics in place to affect other crimes, such as domestic violence.[16]

The NHTSA recommends that a DDACTS model should include seven principles, all of which are interrelated:

1. Participation of partners and stakeholders
2. Data collection
3. Data analysis
4. Strategic operations
5. Information sharing and outreach
6. Monitoring, evaluation, and adjustments
7. Outcome measurement

However, not all seven principles are required for successful implementation of the model. Appendix C includes more detailed information on these principles and a figure illustrating how these principles are connected.

The Cost to DPD of Adopting the DDACTS Model

The DAU is responsible for all DDACTS-related tasks involving data analysis, while the districts and Traffic Operations are responsible for policing based on the DAU's resulting analyses. Table 1 shows that the DAU uses 1 percent of DPD's labor resources to conduct its analytical work.

[15] Robert E. Worden and Sarah J. McLean, DDACTS in Theory and Practice (The John F. Finn Institute for Public Safety, Inc., 2009), 3-5.
[16] *Ibid.,* 6.

TABLE 1. Employee Costs comparing Data Analysis Unit to Denver Police Department

	2014 Actual	2015 Actual	2016 Estimated	2017 Budgeted
DPD Personnel Costs	$189,895,529	$199,518,683	$200,329,846	$210,870,248
DAU Personnel Costs	$897,791	$1,011,368	$1,178,300	$1,217,183
DPD FTEs	1,715	1,750	1,782	1,846
DAU FTEs	14	15	17	17

Source: Compiled by the City and County of Denver's Budget and Management Office on 2/9/17 based on the Denver Budget Book and accounting records.

Note: FTE stands for full-time employee.

Analyzing how much time DPD has dedicated to DDACTS is more difficult to assess. Because DPD has integrated the DDACTS model into its operations, and resources used for it are not tracked separately, we were unable to estimate the cost of implementation. The primary resources used for DDACTS are employee time spent on data analysis and employee time dedicated to DDACTS field operations. However, the DAU performs a variety of analyses, only some of which are related to DDACTS. Analyses related to DDACTS are primarily performed by one analyst who spent approximately two months designing the DDACTS zones and times prior to the Citywide DDACTS roll-out in May 2015 and three weeks to prepare the Denver Police DDACTS: Year 1 report (year-one evaluation). Aside from the DDACTS-related data analysis and DDACTS training, we were not able to obtain data on itemized personnel costs for the DDACTS model's implementation. Officers carry out directed patrol in areas of high crime and accidents during both regular time and overtime.

Determining the cost of software and hardware associated with DDACTS is also challenging because DPD uses existing systems. In addition, DPD uses various technologies for policing in DDACTS zones, including Mobile Data Terminals (MDTs) installed in police vehicles; software used by police officers, such as Accurint Crime Analysis, to pull up maps of recent crime and law enforcement activity; Automatic License Plate Readers (ALPRs) to identify vehicles of interest; High Activity Location Observation (HALO) cameras; and ShotSpotter technology, which sends quick notification of shootings in the City to officers.[17] None of the software, hardware, or policing technologies were acquired exclusively for DDACTS.

Other Data-Driven Policing Efforts within DPD

DDACTS is one of several DPD data-driven policing initiatives. Following is list of other strategies and tactics that we noted during this audit:

- **Focused Area Policing** – This tactic was first introduced in DPD's Strategic Plan in 2014. The purpose of focused area policing is to identify both chronic and acute areas of criminal activity to dedicate resources to impact crime. District sector lieutenants selected areas of focus with specific boundaries based on operational knowledge and

[17] MDTs are computers installed in police vehicles that are equipped with all of the applications needed by officers to carry out their policing activities and administrative duties.

experience. They utilized the DAU and district analysts to measure the impact of their policing tactics in these areas. This tactic was replaced by real time crime analysis as a result of the increasing use of the Accurint Crime Analysis application since late 2014.[18]

- **Real Time Crime Analysis** – This type of analysis is used to direct district police resources for targeted prevention and enforcement activities. Officers and sergeants focus on areas based on data and maps available through Accurint Crime Analysis. This approach allows district commanders to respond quickly and efficiently to emerging crime trends. As described in DPD's 2015 strategic plan, the department analyzes the correlation between changes in officer initiated activity and Uniform Crime Reports (UCR) Part 1 crimes to evaluate the success of this method.[19] We expect the same analysis to be presented in the department's 2016 strategic plan.
- **CORE Meetings** – These weekly meetings are used as an accountability tool.[20] District analysts prepare crime fluctuation, pattern, geographic concentration, and offender reports and maps for lieutenants and commanders to use when updating DPD leadership on crime, traffic, and enforcement efforts in their districts. DAU analysts prepare data, maps, and analysis for the chiefs to question commanders about crime changes and successful prevention measures. Following the CORE meetings, analysts meet with investigative sergeants to discuss current issues in greater detail and focus on areas of concern identified. In addition, on a weekly basis, district analysts provide crime maps for the past 7 and 28 days to officers.
- **Specific Crime Detection and Prevention** – District analysts and specialty crime analysts help districts identify patterns to locate criminals and predict future crimes. Among other techniques, specialty crime analysts perform cell phone analysis, conduct social media research, and create crime timelines to assist investigators.
- **Redistricting Analysis** – The DAU produce analyses to help redistricting (last completed in 2013) and re-precincting (currently in progress). The analysts review calls for service to determine workload and response times, population changes, number of businesses, size and other area characteristics, street length, and district resources available. When there is large discrepancy in response time and call volume, an analyst will coordinate with the District Commander to identify new district or precinct boundaries and provide several plans based on new boundaries.

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[18] Accurint Crime Analysis software for real-time predictive policing is an online dashboard that enables crime, traffic, and call for service data sharing, pattern analysis, mapping, predictive analytics, and reporting for law enforcement. Users can view, analyze, and download crime, traffic, and call data from agencies in their region or even agencies across the nation. The data is automatically extracted and cleaned from disparate data sources to improve data quality standards and promote multi-agency collaboration. It also provides law enforcement with dashboard analytics, mapping, and reports to help analysts, investigators, and decision makers striving for data-driven predictive policing decisions.

[19] UCR Part 1 crimes are more serious crimes and include homicide, sex assault, robbery, aggravated assault, burglary, theft from motor vehicle, larceny, auto theft, and arson. For comparison, UCR Part 2 crimes are less serious crimes and, among others, would include criminal mischief, drunkenness, prostitution, forgery, and vagrancy.

[20] CORE stands for Command Operations Review and Evaluation. CORE is DPD's equivalent of COMPSTAT. COMPSTAT was developed and applied in NYC in the early 1990s and has since then been widely adopted across the nation. It is based on frequent data analysis to respond to and prevent crimes. It is a tool that empowers middle management to make decisions within their districts and to hold them accountable based on the results.

OBJECTIVE

The objective of the audit was to assess to what extent the Denver Police Department and its Data Analysis Unit have designed, implemented, and evaluated the Department's use of the Data-Driven Approaches to Crime and Traffic Safety (DDACTS) in an effort to reduce social harm.

SCOPE

The audit focused on the design, implementation, and evaluation of the DDACTS model beginning in 2013.

METHODOLOGY

We applied multiple methodologies to gather and analyze information pertinent to the audit scope. Specifically, to assess the extent to which DPD and the DAU have designed, implemented and evaluated its DDACTS model, we used the following methodologies:

- Reviewing academic literature of DDACTS history, theory, implementation, policing performance measures, and general policing strategies and methods
- Assessing DDACTS model implementation best practices as reported by other cities and in the academic literature
- Interviewing DDACTS subject matter experts
- Interviewing DPD personnel
- Reviewing prior City audit reports to learn about DDACTS- related processes, controls, and risks as well as related information systems
- Assessing the adequacy of the design of the internal control procedures surrounding the two main data collection systems used for DDACTS design and evaluation: Records Management System (RMS) and Computer Aided Dispatch (CAD)
- Preparing flowcharts of the data collection, quality control, and analysis procedures for DDACTS
- Reviewing excerpts of the DPD Operations Manual and other internal policies and procedures pertinent to DPD's implementation of the DDACTS model
- Reviewing DPD's strategic plans for the years 2013 through 2015
- Analyzing financial information, strategies, and performance measures defined for DPD contained within the City's budget books for the years 2013 through 2017 as well as DPD's annual reports for 2013 and 2014
- Reviewing DAU's financial information obtained from the City's Budget and Management Office for the years 2014 through 2017

- Performing one ride-along with officers in each of the six DPD districts to observe data collection and quality control procedures and data-driven policing efforts
- Comparing officer Daily Activity Sheets to the observed activities during ride-alongs to assess the accuracy of time and action class tracking.[21]
- Reviewing DPD's presentations on Command Operations Review and Evaluation (CORE) meetings and the DDACTS model given to the International Association of Crime Analysts
- Attending two CORE meetings in January 2017
- Walking through the DDACTS zone and time identification process
- Reviewing DDACTS zones/times and key DDACTS concepts prepared by the DAU in Spring 2015 and the first annual evaluation performed in Summer 2016
- Reviewing examples and summaries of the DDACTS daily data sheets from Traffic Operations for the period of May 2015 through February 2017
- Evaluating news articles about DPD's DDACTS efforts and those of other cities in the Metro Denver area
- Comparing DPD's DDACTS model implementation to the DDACTS Operational Guidelines (Operational Guidelines) and best practices
- Evaluating a small number of operational plans and post-operation reports for DDACTS operations in 2015 and 2016

[21] According to the DPD Operations Manual, § 109.00, Class 1 actions are defined as those of a police nature where the officer is directed by a call for service, police supervisor, or directions from other management. Class 2 actions are defined as those actions of police nature where the officer encounters the actions as a result of routine patrol or personal initiative. Class 3 actions are defined as those of non-police nature, such as errands, eating, court, or time at the garage. These actions are commonly called administrative. Class 4 actions are defined as those which are community work, involving problem solving, crime prevention, or community partnership. Class 4 actions may be of police nature if linked with Class 1 or 2 actions.

FINDING

Benefits of the DDACTS Model Have Not Been Fully Realized Due to Shortcomings in Design, Implementation, and Evaluation

The Denver Police Department (DPD) has expressed a commitment to using data to enhance policing operations and align officer patrol activity as a crime prevention tool in both the department's vision and its overall strategy. These strategies specify that DPD should continue developing and improving models that use data to deploy resources more effectively and efficiently.[22] Further, the strategies highlight the importance of identifying both chronic and acute areas of criminal activity, developing specific tactics, and measuring the impact of resources and tactics on criminal activity.[23]

In alignment with these strategies, DPD currently employs several data-driven tactics that incorporate data analysis to identify both acute crime hot spots and chronic areas of crime, then directing targeted crime prevention and enforcement activities.[24, 25] Data-Driven Approaches to Crime and Traffic Safety (DDACTS) is one of these tactics, according to DPD command staff and personnel in the Data Analysis Unit (DAU). Specifically, DDACTS uses data to identify chronic areas of crime and traffic accidents. The DDACTS model is intended to reduce crime and traffic accidents by focusing police efforts on specific areas through highly visible traffic and officer initiated enforcement activities. DPD started using DDACTS in two of its districts in 2013 and implemented it Citywide in May of 2015.

Despite the alignment between the principles underlying the DDACTS model and DPD's commitment to data-driven policing, we found that DPD is not fully committed to DDACTS and did not fully incorporate it into its overall strategy. First, we found that the DAU should complete additional data analyses to determine whether DDACTS zones identified for targeted enforcement activities could be refined by considering both the proximity of crime and traffic accidents and the specific crime types within each zone. Next, we observed that district commanders responsible for the execution of DDACTS express varying levels of support for the model, which leads to disparate implementation of the model across the City and County of Denver (City). Finally, we found that district commanders and the DAU do not adequately monitor and evaluate the effectiveness of DDACTS, such as

The Denver Police Department is not fully committed to the DDACTS model.

[22] Mayor's Budget, 2013-2016, Denver Police Department Budget Summary, accessed October 27, 2016, https://www.denvergov.org/content/denvergov/en/denver-department-of-finance/financial-reports/city-budget.html

[23] Denver Police Department, 2014 Strategic Plan, accessed October 31, 2016, https://www.denvergov.org/content/denvergov/en/police-department/about-us/strategic-plans.html

[24] Denver Police Department, 2013 and 2015 Strategic Plans, accessed October 31, 2016, https://www.denvergov.org/content/denvergov/en/police-department/about-us/strategic-plans.html

[25] "A hot spot is a geographical area identified through data analysis that has a distinguishing concentration of crime, crash, and safety problems", U.S. Department of Transportation, National Highway Traffic Safety Administration, *Data Driven Approaches to Crime and Traffic Safety (DDACTS): Operational Guidelines*, Report No. DOT HS 811 185, (Washington, DC, 2014), 31. DPD distinguishes two types of hot spots: 1. long term problematic areas where crime and traffic issues overlap, primarily referred to as DDACTS zones; 2. Recent outbreaks of two or more crime incidents in an area.

using sufficient and reliable performance measures to determine whether adjustments to the model are necessary.

The DDACTS Model Has Not Been Fully Incorporated into DPD's Operations and Strategy

DPD's strategic plans include various data-driven policing strategies, but the DDACTS model is not reflected in the department's strategic plans starting in 2015. Additionally, departmental performance measures do not incorporate measures by which to assess the success of DDACTS. Finally, DPD's strategic documentation does not specify DDACTS as part of the roles and responsibilities of operational command staff and the DAU.

DDACTS Is No Longer Included in DPD Strategic Planning

To determine how DDACTS is incorporated into DPD's strategic planning activities, we reviewed the Department's strategic plans from 2013 through 2015. The 2013 strategic plan describes the theoretical foundation of DDACTS and summarizes the execution of the model as a pilot project in two of Denver's six police districts. However, the Department's 2014 and 2015 strategic plans no longer mention DDACTS as a Citywide policing strategy or tactic.

- **2013 Strategic Plan**—In the 2013 strategic plan, DDACTS is listed as one of the three predictive policing models.[26] The plan states that all districts are developing their own DDACTS models, which will target specific issues and areas. A comprehensive review of each DDACTS zone was planned for the end of the year. DPD was also planning to assess the effectiveness of its prediction models and develop techniques to standardize the implementation of its strategies by the end of the year. In that plan, DPD identified the DDACTS pilot program as one of several tactics to be used in each of the two districts selected for the pilot. The plan specifies that these tactics were designed to deter or reduce burglary and aggravated assaults. The plan for these districts included data analysis, mapping patterns and trends, using policing technology, external and internal communication, cooperation with specific stakeholders, environmental design changes, and quarterly operations using all DPD resources. In addition, the strategic plan explained that the department's Traffic Operations officers would assist with campaigns of traffic enforcement in five districts, specifically in areas with high property or violent crime and a high number of accidents. This approach was labeled as DDACTS and reflected several DDACTS principles.
- **2014 Strategic Plan**—In 2014, the DPD strategic plan no longer identified DDACTS as an objective or goal for any district. DDACTS was only mentioned in the context of being one of three predictive policing techniques being used by the DAU to help reduce preventable crime through the efficient and effective deployment of resources. For districts, the 2014 plan introduced a new initiative called "focused area policing," while no longer discussing DDACTS as a district priority. The plan described the purpose of "focused area policing" as being to identify both chronic and acute areas of criminal

[26] The other two predictive policing strategies were a) pattern prediction using software currently called Accurint, and b) risk terrain modeling, which was never implemented by DPD. Denver Police Department, 2013 Strategic Plan, p.50-51, accessed October 31, 2016, https://www.denvergov.org/content/denvergov/en/police-department/about-us/strategic-plans.html.

activity to dedicate resources to reduce crime. Districts used operational knowledge and experience to establish focus areas and target enforcement activities.

- **2015 Strategic Plan**—In May 2015, DDACTS was expanded from a pilot program and implemented Citywide; however, this expansion was not discussed in the 2015 DPD strategic plan. Instead, the 2015 strategic plan directed district commanders to move away from long-term, highly structured problem-solving projects to allow flexibility to respond quickly and efficiently to short-term emerging crime trends based upon real time data. Subsequent to these changes in departmental strategic planning, DPD operational command staff and the DAU described that DDACTS was considered to be one of these long-term problem solving efforts by the department to impact chronic areas of crime.

In comparing DPD's strategic implementation and communication of the DDACTS model to leading practices, we found guidance from the Harvard Kennedy School Program in Criminal Justice Policy and Management (the Kennedy School) to be particularly insightful. Literature from the Kennedy School positions the use of short-term tactics to identify emerging crime threats early and pursue innovation as effective ways to approach crime reduction. We found that DPD is executing short-term tactics, such as analyzing data on a daily basis to focus policing efforts on specific crime types in specific locations.

Although DPD's execution of these short-term tactics is in alignment with best practice, it was a shift in direction away from the long-term activities. This shift may have negatively impacted the execution of DDACTS. Specifically, conflicting guidance from DPD leadership about how districts should prioritize short-term tactics versus the long-term approach of DDACTS made the operational priority and necessity of DDACTS unclear.[27]

If DDACTS is indeed an operational priority for DPD, Department leadership should clearly communicate in DPD's strategic plans how DDACTS should be integrated with other short-term policing tactics. According to the International City and County Management Association, strategic planning is a systematic process used to anticipate and plan for a community's future. More specifically, it is an organization-wide method to identify goals and responsibilities. Strategic planning should include several elements, including a mission statement, basic goals for a three- to five-year period, and strategies or actions that will enable the organization to accomplish its goals.[28]

DPD Has Not Identified Objectives and Performance Measures for DDACTS

DPD's strategic planning documentation identifies outcomes that the Department considers necessary for achieving its mission: "To operate a police agency with a focus on preventing crime in a respectful manner demonstrating that everyone matters." These outcomes include crime statistics, citizen satisfaction with crime prevention, detection, and traffic enforcement, and citizens' perception of safety. Additionally, DPD has defined several performance measures in their strategic planning documentation and reports on outputs, which include the total number of arrests, officer time, number of traffic citations issued, traffic accidents responded to,

[27] Malcolm K. Sparrow, "Measuring Performance in a Modern Police Organization", Harvard Kennedy School Program in Criminal Justice Policy and Management, March 2015, 4.

[28] "Using Performance Measurement for Effective Strategic Planning," International City/County Management Association, accessed May 11, 2017, http://icma.org/en/results/center_for_performance_measurement/home/Article/104542/Using_Performance_Measurement_for_Effective_Strategic_Planning.

fugitive and DUI arrests made, officer initiated calls for service placed, and proactive offenses handled.[29, 30]

These outcomes and outputs are commonly used in policing as performance measures. However, other policing agencies often measure additional enforcement outputs when determining policing effectiveness, such as number of warnings and number of citizen contacts. Various sources on policing performance measurement and DDACTS identify these additional outputs as ideal measures for evaluating the effectiveness of overall policing and DDACTS.[31]

Despite DPD's use of commonly accepted performance measures to evaluate the overall effectiveness of its policing efforts, our review found that DPD did not document desired outcomes or performance measures for DDACTS specifically. This runs contrary to general governmental standards on internal control and performance measurement, which emphasize that management should set objectives to accomplish an entity's mission, strategic plan, and goals. The guidance further specifies that objectives should be specific, quantifiable, and measurable in order to allow for performance assessment.[32] Additionally, DDACTS Guiding Principle VII - Outcomes states that desired outcomes should be identified based on hot spot identification and strategic planning and be as specific as possible to measure impact on traffic accidents and crime.[33] Without defined outcomes or performance measures, DPD cannot sufficiently evaluate the effectiveness of DDACTS in helping to achieve the Department's stated mission.

Distinct Roles and Responsibilities for DDACTS Are Not Documented

As noted in our discussion above regarding DPD's strategic planning documentation in 2013 and 2014, select district commanders and the DAU were originally assigned roles integral to executing the DDACTS model. However, these roles and responsibilities are no longer addressed in strategic planning documentation. Additionally, based on our interviews with district commanders and the DAU, we determined that specific roles and responsibilities for DDACTS are not well defined or understood throughout the department.

District Responsibilities—When asked about their DDACTS operations, district commanders explained that they prioritize citizen calls for service and short-term enforcement and prevention activities in acute areas of criminal activity over carrying out DDACTS activities. This approach is

[29] Output is defined as a measure of the products or services provided by organization to customers. In law enforcement, that includes "number of arrests, number of citizens served, and number of meetings attended." Source: Performance Measurement, Benchmarking, and Outcome Based Budgeting for Wisconsin Local Government (University of Wisconsin Local Government Center: 2009), 13, accessed May 31, 2017, http://www.focusintl.com/RBM133-Performance%20Measurement%20manual%20Volume%20II.pdf.

[30] Mayor's 2016 Budget, Denver Police Department Budget Summary, accessed October 27, 2016, https://www.denvergov.org/content/denvergov/en/denver-department-of-finance/financial-reports/city-budget.html; Denver Police Department, 2015 Strategic Plan, accessed November 21, 2016, https://www.denvergov.org/content/denvergov/en/police-department/about-us/strategic-plans.html.

[31] Malcolm K. Sparrow, "Measuring Performance in a Modern Police Organization", Harvard Kennedy School Program in Criminal Justice Policy and Management, March 2015, 2; U.S. Department of Transportation, National Highway Traffic Safety Administration, *Data Driven Approaches to Crime and Traffic Safety (DDACTS): Operational Guidelines*, Report No. DOT HS 811 185, (Washington, DC, 2014), iv; David McClure, Jeremy Levy, Nancy La Vigne, David Hayeslip, "DDACTS Evaluability Assessment: Final Report on Individual and Cross-Site Findings", Urban Institute, August 2014.

[32] U.S. Government Accountability Office, *Standards for Internal Control in the Federal Government,* GAO-14-704G (Washington, DC, 2014), 35, accessed April 7, 2017, http://www.gao.gov/assets/670/665712.pdf.

[33] U.S. Department of Transportation, National Highway Traffic Safety Administration, *Data Driven Approaches to Crime and Traffic Safety (DDACTS): Operational Guidelines*, Report No. DOT HS 811 185, (Washington, DC, 2014), iv and 24.

consistent with general policing activities in other police departments to balance multiple priorities, and it is in alignment with the priorities outlined in DPD's mission and strategic plan. Due to limited time available for DDACTS after other operational priorities are attended to, and since responsibilities for implementing DDACTS are not well defined, the execution of the DDACTS model varies widely across all six DPD districts. District commanders attribute the varied use of DDACTS to the autonomy they are granted by DPD's Deputy Chief of Operations for developing and implementing the tactics they deem appropriate to address crime issues throughout their districts, including DDACTS zones.

Data Analysis Unit Responsibilities—The DAU's role in DDACTS began with analyzing crime and traffic accident data to identify zones for targeted prevention and enforcement activities. The DAU also completed an initial evaluation on the impact of operational tactics on crime and accidents in these zones. However, these roles and responsibilities of the DAU for designing and evaluating DDACTS, in consultation with operational command staff and commanders, are not addressed in departmental strategic planning documents. Furthermore, district commanders' roles and responsibilities in the evaluation process, including communicating their monitoring and adjustments of DDACTS activities to the DAU, are also not documented, despite being critical. To help ensure goals established in the Department's mission and strategic plan are achieved, DPD should enhance its strategic planning documentation practices to align with general governmental standards on internal controls. These standards state that an agency's objectives should specify "what is to be achieved, who is to achieve it, how it will be achieved, and the time frames for achievement."[34] Additionally, DPD should also ensure that its strategic planning documentation describes how performance goals are to be achieved, including "the operation process, training, skills and technology, and the human, capital, and other resources" necessary to meet established goals.[35] Without documented roles and responsibilities for the execution, monitoring, and evaluation of DDACTS, DPD may be unable to demonstrate accountability for the model's success.[36]

Based on the observed lack of formal roles and responsibilities, documentation in strategic plans, and desired outcomes and performance measures, auditors question the Department's commitment to the DDACTS model and to dedicating the resources necessary to make the model work as intended. DPD leadership must make a policy decision regarding how to use its finite resources and determine whether the DDACTS model is an appropriate tool to support its mission.

If DPD command staff decides to continue pursuing the DDACTS model, improvements should be made to the integration of DDACTS into the department's overall strategy by establishing clear objectives and performance measures, defining roles and responsibilities, and describing the relationship of DDACTS with other short-term policing initiatives.

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[34] U.S. Government Accountability Office, *Standards for Internal Control in the Federal Government*, GAO-14-704G (Washington, DC, 2014), 35, accessed April 7, 2017, http://www.gao.gov/assets/670/665712.pdf.

[35] Government Performance and Results Act, GPRA Modernization Act of 2010 § 1115

[36] Management determines roles and responsibilities in order for the entity to define and achieve their objectives. When roles and responsibilities are defined, the entity is able to establish accountability standards, and to delegate authority for tasks within the organizational structure. U.S. Government Accountability Office, *Standards for Internal Control in the Federal Government*, GAO-14-704G (Washington, DC, 2014), 29, accessed April 7, 2017, http://www.gao.gov/assets/670/665712.pdf.

RECOMMENDATION 1.1

DPD command staff should determine whether the department will continue using DDACTS as a model to efficiently and effectively allocate resources to support its mission to prevent crime.

Agency Response: Disagree

Auditor's Addendum: Exhibit A, p.41-42

RECOMMENDATION 1.2

If DPD command staff decides to continue pursuing the DDACTS model, improvements should be made to the integration of DDACTS into the department's overall strategy by establishing clear objectives and performance measures, defining roles and responsibilities, and describing the relationship of DDACTS with other short-term policing initiatives.

Agency Response: Disagree

Auditor's Addendum: Exhibit A, p.41-42

The DAU Could Improve Its DDACTS Zone Analysis

Before DPD could begin using the DDACTS model, the department had to identify the number and location of DDACTS zones. Police officers then conduct high-visibility traffic enforcement activities in these areas during specific times to deter criminal behavior and apprehend wanted persons. The DAU was tasked with establishing DDACTS zones, and did so using their professional expertise and their understanding of DDACTS Guiding Principle III – Data Analysis. We determined that the DAU used many but not all of the analytical techniques recommended by the Operational Guidelines to identify DDACTS zones and determine the times of day within each zone that correspond with high crime and traffic accident activity.

We think the DAU should conduct additional analyses when creating DDACTS zones to determine where crimes and traffic accidents have the strongest overlap and to identify the type of crimes that are occurring within each DDACTS zone. The Operational Guidelines emphasize that the overlap of crime and traffic is a key element of the DDACTS model, suggesting that these areas should be the primary focus of a police department when using the DDACTS model. The DAU may be able to refine the number and size of DDACTS zones by restricting the zones to areas where crime and traffic accidents occur in closer proximity.

The DAU Used Some DDACTS Operational Guidance When Designing the DDACTS Zones

Through observations and documentation reviews, we determined that the data used by the DAU to identify DDACTS zones align with the DDACTS Operational Guidelines and several leading practices. Specifically, as suggested by the DDACTS Guidelines, the DAU included three years of historical crime and traffic accident data to create the DDACTS zones. Regarding the crime data, the DAU included only property and violent crimes. A DDACTS subject matter expert

noted that including these types of crimes in DDACTS models is a good practice because they are usually reported by citizens rather than identified by officers already present in an area, which reduces biases in the data.

The DDACTS Operational Guidelines also require that police departments use quality data to identify DDACTS zones, as specified in Guiding Principle II – Data Collection. To create Denver's DDACTS zones, the DAU used crime and traffic accident data from DPD's general occurrence (GO) reports stored in the records management system (RMS). The DAU considers the crime and traffic accident data from RMS to be quality data. To verify the accuracy of the DAU's assumption, we assessed the internal controls surrounding RMS, specifically the crime and traffic accident data used by the DAU to identify DDACTS zones. We concluded that the internal controls surrounding this RMS data appear to be adequately designed. Based on the assessed risks and an adequate design of controls, we believe that it was reasonable for the DAU to rely on this data for their DDACTS analysis.

Additionally, we found evidence that the DAU used many analytical techniques to identify DDACTs zones that are supported by Guiding Principle III – Data Analysis in the DDACTS Operational Guidelines, as well as leading practices. First, the DAU combined the crime and traffic data into a single data set. According to the DAU, combining the data allowed them to identify areas with the greatest need for officer presence, regardless of whether the social harm in an area was from crime or traffic accidents. We consulted subject matter experts who noted that police departments implementing the DDACTS model for the first time may focus their analysis on specific crime types or on social harms in-general, rather than explicitly on areas where crime and traffic strongly overlap.

Next, the DAU used multiple spatial analyses techniques in ArcGIS to identify areas within each DPD district with high and low concentrations of crime or traffic accidents.[37] In some instances, hot spots coincided with major traffic corridors or intersections. The DAU recognized these hot spots were traffic-related. Then they performed secondary analyses to expand the traffic-related hot spot into the surrounding neighborhoods so that it included nearby crimes that did not overlap with the corridor or intersection . As a next step, the DAU combined hot spots that were near with one another to define each DDACTS zone.

Finally, the DAU examined the time each crime or traffic accident occurred in JMP, which is a separate statistics software package. The time-of-day data came from DPD's RMS system.[38] As part of this final analysis, the DAU identified the day of the week and the time of day when crimes or traffic accidents occurred most often within each DDACTS zone. The DAU communicated the initial DDACTS zones and times with each district and adjusted them based on the district's feedback. Based on the feedback the DAU received, they added zones to provide more precincts with an area for officers to patrol when they were not on other assignments.[39] The DDACTS Operational Guidelines encourage analysts to collaborate with

[37] ArcGIS is a spatial analysis software package that uses the physical locations of events, such as crime and traffic accidents, to create maps of those events and determine where events occur in high and low concentrations.

[38] Some reported crimes were not included in the time calculation. For example, a victim may not know when a bike was stolen and reports a potential range of time when the crime occurred. In cases where the victim reported a potential time range greater than 12 hours, the DAU excluded these cases from their time evaluation.

[39] District leadership requested that the DAU provide them with enough DDACTS zones so that they could direct officers to patrol areas within their assigned precincts when they were not answering calls. In these cases, the DAU examined the hot spots that had originally been left out because of their relatively lower amount of crime or traffic incidents.

officers and use the officer's knowledge and experience to refine the DDACTS zones. See Appendix D for the DAU's analysis of average annual crime and traffic incidents within DDACTS zones and times for each district.

The DAU's DDACTS zone analysis and design decisions resulted in 27 DDACTS zones across six DPD districts. The number of zones in the districts ranges from two to six. The area covered by any one DDACTS zone ranges from approximately 0.25 square miles to approximately 0.03 square miles. Table 2 shows what percentage of each district encompasses DDACTS zone coverage. The percentage of a district's area covered by DDACTS zones varies from approximately 18 percent in District 6 to approximately 2 percent in District 5.

TABLE 2. Estimated percent of DPD districts covered by DDACTS zones and relative zone size

District	Number of DDACTS zones	Estimated Percent of District Covered by DDACTS Zones	Largest Zone (Approx. square miles)	Smallest Zone (Approx. square miles)
District 1	6	4	0.19	0.05
District 2	5	6	0.25	0.05
District 3	5	2	0.21	0.08
District 4	5	2	0.14	0.03
District 5	2	2	0.34	0.14
District 6	4	18	0.25	0.13

Source: Auditors' analysis of DPD's DDACTS zones and district areas.

Based on our research, we support the DAU's conclusion in their year-one evaluation of DDACTS that the total number of zones, and the size of some of the zones, is potentially difficult to manage. DDACTS subject matter experts note that the size of a zone impacts a police department's ability to saturate the area and effectively conduct high visibility enforcement operations, both of which are essential to the success of the DDACTS model. In fact, districts appear to not focus on some of the identified zones. For example, District 5 reports a 169 percent increase in proactive officer time in one DDACTS zone, but a 3.5 percent decrease in another DDACTS zone. Further, because the DDACTS zone analysis does not include the types of crimes within each zone, DPD's leadership is unable to use the zone analysis to determine the specific tactics that should be applied within each zone to address the crime profile unique to that zone. For example, without the crime information associated with the DDACTS zone, DPD leadership cannot ascertain whether the high-visibility traffic enforcement tactics recommended by the DDACS Operational Guidelines are applicable to a specific DDACTS zone.

The DAU Should Conduct Additional Analyses of Crime and Traffic Accident Data to Improve DDACTS Zone Design—Despite the alignment between the DAU's establishment of DPD's DDACTS zones and some leading practices, we found that there are areas that warrant improvement. This conclusion is based on our comparison of the DAU's analytical work with the DDACTS Operational Guidelines, as well as considering the opinion of subject matter experts on the DAU's approach to establishing the zones. We determined that the DAU should conduct

additional analyses to refine the number or size of existing DDACTS zones and provide additional information to District Commanders that could inform their planning to address issues within each DDACTS zone.

Two leading practices are integral to this conclusion. First, the DDACTS Operational Guidelines note that, when designing DDACTS zones, it is important to identify areas where crime and traffic hot spots overlap. Specifically, the guidelines outline multiple steps that should be taken in the process of identifying the overlap, such as conducting a hot spot analysis of crimes and traffic accidents separately, then overlapping the two hot spot maps. To underscore the importance of this step, the DDACTS Operational Guidelines state: "It must be recognized that there is only a limited overlap between crime and crashes. DDACTS primary focus is in those locations where there is substantial overlap."[40] Second, the Operational Guidelines suggest that police departments examine the types of crimes within each zone, once identified. If a specific type of crime or set of crime types is associated with a zone, that information can be used by police leadership to determine the root causes of the hot spot, which allows them to tailor their strategies to address those causes.

RECOMMENDATION 1.3

The DAU should conduct additional analyses using available crime and traffic accident data, as suggested by the DDACTS Operational Guidelines. The DAU should then determine whether the additional analyses warrant changing or refining existing DDACTS zone boundaries. We recommend that the following two specific analyses be conducted:

First, the DAU should use spatial analyses to identify crime and traffic accident hot spots separately, and then determine where crime and traffic accidents overlap.

Second, the DAU should determine whether specific crimes are associated with each DDACTS zone and provide that information to the appropriate DPD operations personnel.

Agency Response: Disagree

Auditor's Addendum: Exhibit A, p.41-42

DPD Did Not Implement DDACTS in Accordance with Leading Practices

In addition to the shortcomings we identified in the initial design of DPD's DDACTS model, we also determined that DPD has not executed DDACTS in accordance with the Operational Guidelines. Although the DDACTS model allows for flexibility in adopting the model's seven guiding principles, we found that DPD's districts have executed DDACTS inconsistently, and districts could benefit from being in closer alignment with some elements outlined in the DDACTS

[40] National Highway Traffic Safety Administration, *Data Driven Approaches to Crime and Traffic Safety (DDACTS): Operational Guidelines*, Report No. DOT HS 811 185, (Washington, DC, 2014).

Operational Guidelines. Four broad areas characterize the shortcomings we identified. First, most districts did not plan and implement their strategic operations effectively. Second, most of the districts have not demonstrated engagement with stakeholders and partners for the purposes of DDACTS. Third, the DAU did not prepare periodic DDACTS reports. Lastly, most districts did not adequately share information internally and externally.

DPD Did Not Sufficiently Plan or Document DDACTS Strategic Operations

Guiding Principle IV – Strategic Operations addresses the importance of identifying strategies and tactics as well as developing and implementing an operational plan when pursuing the DDACTS model. However, we found that DPD leadership did not, in many cases, sufficiently plan or administer DDACTS. Auditors found no evidence of a plan describing the extent to which the DDACTS model would be adopted or the strategies or tactics to be used for its DDACTS model. Further, DPD did not create operational plans recommended by the DDACTS Operational Guidelines. Finally, we found little to no documentation of DDACTS policing activities.

DPD Does Not Have DDACTS Strategic or Tactical Plans—Our audit found that DPD did not establish specific DDACTS strategic and tactical plans by which to execute the DDACTS model. As explained in DPD's 2015 strategic plan, the department believes that strategic and tactical plans are important because they give concrete guidance for implementing a new strategy on a broad level.[41] For DDACTS, however, DPD has relied on the DDACTS Operational Guidelines without demonstrating how these guidelines are being carried out in the form of strategies or tactics for DPD's DDACTS model. DPD's 2013 strategic plan does address tactics for specific types of crimes in individual districts. Specifically, the District 1 section mentions DDACTS as a strategy to combat burglary, and the District 2 section presents DDACTS as a strategy for the district to use to combat aggravated assaults. The strategic plans for 2014 and 2015, however, no longer mention DDACTS-specific strategies or tactics being used by DPD districts in their policing operations.

When asked why DPD did not integrate DDACTS throughout its strategic and tactical plans, DPD leadership responded that DDACTS is one of many tools used by the Department, and it is executed through the application of general DPD strategies and tactics. Therefore, DPD leadership reasoned, there was no need to create DDACTS-specific strategies and tactics.[42] When asked about how the DDACTS model is being executed through general DPD strategic and tactics, most officers and corporals cited vehicle and pedestrian stops as the primary or only DDACTS tactic being employed in their districts. DPD personnel also noted they had not been provided with specific instructions on how to execute DDACTS initiatives, reasoning that "[all DPD officers know] how to make *quality stops*."[43]

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[41] The Department's 2015 Strategic plan gives an overview of the use and importance of planning, as follows: "The Denver Police Department (DPD) achieves its mission by successfully delivering the strategies and underlying tactics that contribute to a safer community. All levels of the plan—Mission, Strategies, and Tactics—are measured against predefined success criteria."

[42] DDACTS, as described in the Operational Guidelines, is an operational model. It is also referred to as an initiative or a strategy at DPD. DDACTS is intended to impact many areas of policing and refine policing strategies. It may impact the organization at many levels.

[43] A quality stop as defined by the DAU is a stop where the contact may have an impact on the citizen to reduce crime. An officer checking to see if a business has locked their doors after hours would not be a quality stop, but the officer talking to the business owner about the importance of locking their doors would be considered a quality stop.

Although the DDACTS Operational Guidelines provide police departments flexibility concerning the extent of implementation based on their unique circumstances, the guidelines' Principle IV – Strategic Operations emphasizes that police departments should identify specific high visibility enforcement strategies and tactics. Specifically, it is recommended that police departments identify the traffic and crime enforcement activities, the personnel and training required, the adjustments to be made to operating standard procedures, the communication needed to pursue buy-in, the method to obtain input from identified partners and stakeholders, and the desired goals.

The DDACTS model allows for flexibility in adopting the model's seven guiding principles.

The DDACTS Operational Guidelines discuss and we recognize that creating time during patrol officers' regular shifts to carry out Class 2 DDACTS actions and combating the perception that Class 2 patrol time is unavailable for a DDACTS initiative can be difficult. Conducting an objective analysis of available patrol hours and unobligated time and engaging officers in strategic planning discussions can potentially benefit the communication with officers about the importance of Class 2 actions in DDACTS zones.

DPD Did Not Consistently Create Operational Plans for DDACTS—Operational plans differ from strategic or tactical plans in the sense that operational plans are even more specific. Strategic and tactical plans contain broader information about the strategies, tactics, and resources employed by a jurisdiction in response to various issues. Operational plans, as defined by the Principle IV of the DDACTS Operational Guidelines, provide information regarding personnel, resources, training, tactics, and monitoring procedures in a DDACTS zone to address specific issues.

We only received operational plans from two districts: District 2 and District 6. All other districts either did not have DDACTS operational plans in their archive or never created such plans. We reviewed the operational plans we did receive—one from District 2 and three from District 6—and compared them against the principles included in DDACTS Operational Guidelines Principle IV. All four plans included tactics, personnel, partners, equipment, time, location, and targeted crimes; these elements are consistent with DDACTS principles. Operational Guidelines also recommend including goals, objectives, training, budgeting, and evaluation. The plans we reviewed did not explicitly contain each of these elements. The reports did, however, include the time and location for officers to be briefed before the operation and the source of funding. The DDACTS Operational Guidelines describe an operational plan as something that "describes the overall deployment strategy for the hot spot". The provided plans, however, only covered short enforcement operations of 10 hours or less and did not describe the long-term overall deployment strategy for the selected zones. Therefore, we conclude that the operational plans utilized by some of the districts appear to serve a different purpose than the plans recommended by the DDACTS Operational Guidelines and the remaining districts either did not prepare or did not retain any written DDACTS operational plans.

DDACTS operational plans should describe the overall deployment strategy for the hot spot.

Additionally, we reviewed research conducted by the Harvard Kennedy School's Program in Criminal Justice Policy and Management. A high-visibility operation is only appropriate when it constitutes an intervention for a specific problem. An operational plan should be thoughtfully designed in response to a specific crime problem and should include the following: the specific

pattern of crime being addressed, the intervention options being considered, an action plan with attention to specific violations, instructions to officers, and measuring effectiveness.[44] DPD should consider these recommendations when preparing its operational plans for DDACTS.

DDACTS Operational Activities—Although these activities are not documented, districts appear to use the following DDACTS-related activities and operations to varying degrees:

- **DDACTS During Uncommitted Time**—District and Traffic Operations officers are encouraged to go to DDACTS zones if they are not responding to calls for service or patrolling in areas where short term problems have been identified. However, we learned that this activity is not always easy to carry out due to other demands. Since DDACTS times tend to be the same times when officers are most likely to receive a lot of 911 calls, we learned that they are unlikely to have uncommitted time available during DDACTS times. Additionally, because the DDACTS zones often have high levels of traffic congestion, an officer may avoid the zones during rush hour so they can respond to calls for service in a more expedient manner.
- **Increasing General Visibility**—In some districts, officers are encouraged to complete administrative duties while parked in a highly visible location in a DDACTS zone or to drive through a DDACTS zone when responding to a non-urgent call, which will increase visibility of police presence.
- **Small-Scale DDACTS Operations**—Some districts reported using small-scale DDACTS operations with approximately five officers.[45] These operations can occur during regular work hours or during overtime hours.[46] Overtime operations typically last four hours following a regular shift and may or may not occur during a DDACTS time. Based on our review of post operation reports for ten of these small-scale operations, all were carried out within DDACTS zones but only two during DDACTS times. We also noted that, of the operational plans we obtained, all four operations employed high visibility enforcement as a crime prevention measure, but only two of the four operations were carried out in DDACTS zones and only one of them was during DDACTS time.
- **Large-Scale DDACTS Operations**—Some districts reported executing large-scale DDACTS operations using a combination of district officers, Traffic operations employees, the Gang Unit, the Vice Unit, Code enforcement employees, Licensing specialists, and other partners or stakeholders. Auditors could not obtain sufficient information about the duration of a typical large-scale DDACTS operation. A District 4 employee described an

[44] Malcolm K. Sparrow, "Measuring Performance in a Modern Police Organization", Harvard Kennedy School Program in Criminal Justice Policy and Management, March 2015, 18-19.

[45] Small scale DDACTS operations were reported using different combinations of DPD employees, including district officers, Traffic Operations employees, and what are known as Impact Teams. Every district has at least one Impact Team, which consists of approximately four officers and one sergeant. Impact Teams are generally not tied up responding to calls for service; rather, they are dedicated to addressing a district's most pressing crime problems and preventing crime. These problems are usually identified using the current hot spot analysis, but may be in DDACTS zones and during DDACTS times. Some districts have reported using these teams for DDACTS operations.

[46] DDACTS operations executed during overtime are generally funded with Overtime Traffic Control (OTTC) funds. This is a separate budget used specifically for overtime operations. The Chief's Office allocates these funds to districts based on crime and traffic issues. The funds may be allocated for crime prevention and detection, not only traffic issues. When allocated, the districts break them down into individual operations lasting a day or less. After the operation, the supervisor will file a report with the Chief's Office. The Chief's Office tracks some statistics such as resources spent and outputs such as arrests and citizen contacts. They do not, however, track whether the OTTC operation was specific to DDACTS.

example of one such operation, that took place in the first year of implementing DDACTS in one of the District 4 DDACTS zones. During the operation, DPD officers conducted high visibility traffic stops with the primary focus on citizen contacts. To achieve the large-scale operation, they utilized resources from outside of the district in addition to their own patrol officers.

Although these descriptions by DPD personnel of various DDACTS operations were helpful in shaping our understanding of how DPD has executed the DDACTS model, they are of limited value in making a strong conclusion about the degree to which DPD's activities reflect leading practices. DPD has not tracked these DDACTS operations separately from other policing activities, documentation of these operations was minimal, and most of the testimonial evidence we gathered through interviews was vague. The Standards for Internal Control in the Federal Government, commonly known as the Green Book, emphasizes that effective documentation helps management to communicate the personnel resources, department resources, timeline for implementation, and goals for their operations. Designing and documenting planned operations enables the organization to effectively take steps to achieve their objective, and helps to communicate relevant information about planned operations both inside and outside of the department.[47] Thus, we cannot conclude on the characteristics of DPD's DDACTS activities or determine the number and frequency of the operations. We did confirm, however, that one of the districts has discontinued the use of the DDACTS model as of July 2016. A new commander was assigned to District 6 to focus on several issues, including drugs, homelessness, and public protests. Since DDACTS did not appear to be a focus for the district, the new commander made the decision to cease using the DDACTS model in District 6 despite District 6 having the highest concentration of crime and traffic of all the districts. If the zones were designed based on Citywide data, nearly all hot spots would be in this district.[48]

> *We cannot conclude on the characteristics of DPD's DDACTS activities or determine the number and frequency of the operations.*

Our research did reveal several cases of successful DDACTS operational activities. The Urban Institute released a DDACTS Evaluability Assessment in August 2014, which highlighted six jurisdictions with a DDACTS model that should be considered to evaluate the effectiveness of the implementation of DDACTS by the NHTSA.[49] These six jurisdictions all exhibited certain characteristics making them ideal candidates for evaluating effectiveness: a continuous commitment to the DDACTS model, consistency with DDACTS training curricula, engagement

[47] U.S. Government Accountability Office. *Standards for Internal Control in the Federal Government.* GAO-14-704G (Washington, DC, 2014), 29, accessed April 7, 2017, http://www.gao.gov/assets/670/665712.pdf.

[48] Based on our review of DDACTS literature and interviews with subject matter experts, we concluded that designing the zones by district was appropriate as it aligned with DPD's operational structure and resource allocation.

[49] In 2012, the National Institute of Justice awarded a grant to the Urban Institute to conduct an evaluability assessment of DDACTS initiative. An evaluability assessment is a systematic process that helps identify whether an evaluation is justified, feasible, and likely to provide useful information. The final DDACTS Evaluability Assessment was intended to be used to inform current and future DDACTS sites on the state of DDACTS implementation as well as to support potential future DDACTS evaluations undertaken by the federal government.

and commitment of key personnel, and adequacy of local data systems, among other criteria.[50]

One of the jurisdictions identified by the Urban Institute was Gilbert, Arizona, where traffic officers, community service officers, and patrol officers all work on DDACTS duty. During DDACTS duty, officers are more focused on making citizen contacts as part of a high visibility enforcement strategy. Additionally, the Bureau of Justice Assistance released a report describing an example of a jurisdiction that successfully implement DDACTS, Shawnee, Kansas. There, officers are assigned to conduct high-visibility traffic enforcement in the DDACTS zones at DDACTS times. Shawnee officers assigned to DDACTS duty notify dispatch that they are not available for Class 1 calls, which allows them to work in DDACTS zones without interruptions. The objective for DDACTS operations is a minimum of 25 hours per week in the zone during DDACTS times. The goal is to reach this number of hours in the zone 85% annually.[51] These examples highlight different approaches that other police departments dedicated to the DDACTS model have taken to ensure that ample time is dedicated to DDACTS activities and operations, thus increasing the likelihood that the model results in crime and traffic accident reduction.

DPD Did Not Identify Partners and Stakeholders for Its DDACTS Initiative

In addition to DPD's strategic and operational planning shortcomings, we also found problems with its partner and stakeholder engagement relative to the DDACTS Operational Guidelines Principle I – Partners and Stakeholders Participation. Specifically, DPD did not identify its DDACTS partners and stakeholders and did not prepare a partner and stakeholder participation plan. While DPD has not separately identified partners and stakeholders for the purpose of DDACTS, we noticed that they have pre-existing partner and stakeholder relationships from other policing activities. DPD may cooperate with these partners and stakeholders within DDACTS zones, but it appears this activity is driven by crime prevention priorities and not the DDACTS analysis. In addition, we found that some DPD personnel are not aware of the stakeholders' and partners' role in DDACTS implementation.

Although DPD cooperates with partners and stakeholders on a variety of issues, DDACTS-specific cooperation is not separately documented. Moreover, districts do not compile a listing of the major issues in their DDACTS zones, and of the partners who may help resolve these issues. Therefore, we were unable to determine the extent of and details regarding cooperation within DDACTS zones, and were unable to obtain assurance that DPD is cooperating in all DDACTS zones and that issues prevalent in those zones are adequately addressed. Some examples of cooperation with partners and stakeholders are as follows:

- For the traffic-specific side of the DDACTS model, DPD collaborates with the City's Public Works Transportation and Mobility division on identifying opportunities to improve traffic

[50] These jurisdictions are smaller than Denver and may not be comparable in the number of crime and accidents. However, Denver has designed and implemented DDACTS by district. The districts are more comparable to these jurisdictions in size, crime, and accident statistics.

[51] U.S. Department of Justice, National Institutes of Justice and Smart Policing Initiative "Smart Policing and Data Driven Approaches to Crime and Traffic Safety (DDACTS)," 50-51, 56, accessed May 22, 2017, http://www.smartpolicinginitiative.com/sites/all/files/Webinars/SPI%20DDACTS%20Webinar%20052814%20FINAL.pdf.

safety through environmental design.[52] This might include making changes to intersections or signs to reduce traffic accidents.

- District 1 has a relationship with the Lakewood Police Department, and District 2 is working with the Aurora Police Department, regarding problem areas located along the border separating the City and County of Denver from these other jurisdictions.
- DPD has worked with the Prosecution and Code Enforcement practice within the City Attorney's Office to help put pressure on motel owners on East Colfax Avenue to discourage drug- and prostitution- related crime.

We also found that most of the DPD district employees reported to have occasionally collaborated with internal DPD units to execute their DDACTS high visibility operations. This cooperation would typically happen as part of a larger scale operation. It appears that districts had more larger scale DDACTS operations at first, but few districts have sustained this level of activity. Some examples of such cooperation are the following:

- Districts cooperate with Traffic Operations on school safety, traffic safety, and pedestrian safety, primarily during special operations.
- The DPD Gang Unit provides support for high visibility enforcement on operations within DDACTS zones for gang-related criminal activity.
- DPD's Vice Unit performs high visibility enforcement during operations within DDACTS zones that have significant crime activity related to prostitution.
- The DAU designed the DDACTS zones and times and is responsible for evaluating the effectiveness of the DDACTS model annually.
- Impact Teams within districts sometimes work in DDACTS zones to perform high visibility traffic enforcement or other tactics to target specific types of crimes, such as illegal drug sales or gang activities.
- DPD's Homeless Outreach Team (HOT) helps handle issues related to homelessness throughout the City, including in DDACTS zones.

The DDACTS Operational Guidelines Principle I - Partners and Stakeholders participation emphasizes the importance of cooperation and communication with stakeholders and partners to reduce social harm in the identified hot spots. Specifically, the guidelines state that "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."[53] In addition, the Green Book states that documentation is a method to communicate who, what, when, where and why for execution of

Partner and stakeholder participation is essential to the success of the DDACTS model.

[52] Transportation and Mobility designs, installs, operates, and maintains the City's traffic control systems and off-street parking assets.

[53] National Highway Traffic Safety Administration, Data Driven Approaches to Crime and Traffic Safety (DDACTS): Operational Guidelines, Report No. DOT HS 811 185, (Washington, DC, 2014).

initiatives or programs. For example, in Baltimore County, Maryland, the police department developed a partnership with the Division of Parole and Probation to identify criminal offenders under supervision in target areas. Community outreach officers in each precinct attended community meetings to present data on crime trends and calls-for-service. In Philadelphia, Pennsylvania, the police department implemented DDACTS exclusively in the city's 25th district. The Philadelphia Police Department worked with several internal and external stakeholders including: Traffic Operations, Narcotics Unit, Taxi enforcement, Liquor control, housing police, Southeastern Pennsylvania Transportation Authority Transit Police, Philadelphia Highway Patrol, and university police departments from Temple University and University of Pennsylvania.

DPD's Infrequent DDACTS Reporting Does Not Align with the Operational Guidelines

Except for Traffic Operations Unit's tracking of its DDACTS efforts, DPD does not prepare any periodic reports about DDACTS-related activities and performance.[54] Such reports could be used to inform changes to the way the model is being executed and for internal or external stakeholder information.

The DDACTS Operational Guidelines Principle III – Data Analysis specifies that agencies should develop reporting procedures, including developing a procedure for who receives the information, scheduling data analysis at regular intervals, considering different formats of data analysis, determining internal and external data analysis needs, ensuring accuracy and transparency of the analysis, and developing a process for external release of information. However, audit work revealed that DPD has not fully developed DDACTS reporting procedures. After reviewing the DDACTS initiatives of several other cities, we found examples of regular and frequent DDACTS reporting, as evidenced in the following examples:

- In Everett, Massachusetts, the police department reports to city hall on DDACTS outcomes at regular intervals.
- In Fargo, North Dakota, the police department reports DDACTS updates in their monthly COMPSTAT report. This report includes crime and traffic accident statistics, including a prior year comparison as well as year-to-date totals. This monthly report also contains maps that show trends for various crime types**.**
- In Lansing, Michigan, DDACTS data is captured monthly by the DDACTS operations sergeant. In addition, the department's coordinating sergeant works with the department's crime analyst to make monthly hot spot maps, and regularly reports to the captain with recommendations for adjusting strategy, location, and resources.

DPD Does Not Share Sufficient Information about DDACTS Internally or Externally

Finally, we found that DPD does not sufficiently communicate about its DDACTS model internally or externally. We identified three areas where communication could be improved. First, DPD is not sufficiently communicating about its DDACT model to affected communities and businesses or the public. Next, we noticed a lack of DDACTS training and awareness at DPD. Finally, we found that communication between DPD leadership, DAU, districts, and Traffic Operations Unit is insufficient.

[54] Although District 5 utilized the Traffic Operations DDACTS reports to prepare for CORE meetings, other districts and DAU have not reported using them.

Insufficient External Communication—In assessing how DPD has communicated externally about the DDACTS model, we found two areas that were insufficient. First, we looked at mentions of DDACTS in the press and found that, in most cases, DDACTS in incorrectly described, being confused with the car mounted Automatic License Plate Readers. While these reports have been originating outside of DPD, DPD's Public Information Office (PIO) does not have a plan for communicating about DDACTS, does not have any understanding of the model, and does not have a role in DDACTS implementation.[55] The PIO has not made efforts to correct these articles and when asked about their public communication plan about DDACTS, the PIO sent copies of these incorrect articles. In addition, we contacted several of DPD's Community Resource Officers (CROs), all of whom lacked awareness of DDACTS implementation in their districts and played no role in it.[56] Despite these instances, we did find one publicly available video, which accurately depicted DPD's DDACTS model.

Second, although we observed DPD communicating with some businesses and neighborhood associations about the implementation of the DDACTS model, this information sharing is minimal. For example, DPD did not share any information about its DDACTS zones and times with the affected communities or the public. By reviewing internal communication, we found that DAU has advised the districts to not share this information; the DAU reasoned that if the maps of the DDACTS zones and times were shared with the public, certain citizens might then avoid the areas and times rather than be present for the increase in high visibility enforcement. DPD stated that they are regularly attending meetings with members of the community. While the concepts of DDACTS model may have been discussed in some of these meetings, it appears that DPD did not mention DDACTS by name and did not share any specifics. This approach contradicts the literature on DDACTS, which emphasizes that sharing information about DDACTS zones and times can amplify the high visibility of the enforcement actions.

Law enforcement agencies should share progress and receive feedback from internal and external stakeholders and partners on its DDACTS model's implementation.

According to the DDACTS Operational Guidelines' Principle V – Information Sharing and Outreach, law enforcement agencies should not only share progress on DDACTS high visibility enforcement, they should also receive feedback from internal and external stakeholders and partners. Further, they should develop procedures for documenting results as well as disseminating those results to their organization.

Regarding media outreach, the Operational Guidelines' Principle V also states that agencies should develop a plan to reach out to media outlets and share information about the DDACTS model. 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. For example, Egg Harbor Township PD distributed several articles in the community regarding DDACTS, and most feedback it has received has been positive. The agency primarily conducts outreach through social media such as Facebook and Twitter.

[55] The PIO assists with media inquiries, records requests, and other communications related items.

[56] CROs provide community assistance on issues such as neighbor disputes, public nuisances, zoning issues, fraud and crime prevention, and other neighborhood concerns.

Scholars in public administration have also studied the importance of communication by law enforcement. In a Government Communication Effectiveness and Satisfaction with Police Performance study in Kansas City, Missouri, researchers found that effective communication improves public satisfaction with police protection and crime prevention even more than decreases in crime rates alone.[57]

Insufficient DDACTS Training within Lower DPD Ranks—Although we found that DPD leadership and supervisors have received DDACTS training, our evidence points to a lack of awareness and understanding of DPD's DDACTS model among personnel involved in its implementation. Specifically, we found that the districts have trained officers on DDACTS inconsistently.

DPD states that most of their supervisory level personnel received a two day DDACTS training in April of 2013. This was offered as an optional course, rather than being required for police certification. Since it was not mandatory, DPD did not need to retain training documentation. Accordingly, auditors could not determine who attended this training. Prior to and after this, some key DPD personnel received DDACTS training externally. For example, District 3 stated that district leadership took the DDACTS training as far back as 2010 and as recently as 2015.

While DPD claims that DPD's leadership, for the most part, received DDACTS training, we determined that DPD provided inconsistent and varied training of the DDACTS model to other personnel involved in its implementation. This was evidenced in the following ways:

- Districts 1, 2, 3, and 6 provided no documentation, minimal and unclear information on the timing, format, content and attendance of its DDACTS training for officers. It appears that their training consisted of distributing the DDACTS zone maps with time and key concepts provided by DAU and briefly discussing it once during a roll-call. In contrast, Districts 4 data analyst and District 5 training officer oriented patrol officers and supervisors during roll-calls. In District 4, DDACTS orientation was provided once in June 2016, approximately a year after DDACTS was implemented Citywide. Timing of District 5 training is unknown. Since then, training corporals have provided all other orientations. These districts used DDACTS presentation slides which include basic information about DDACTS and success stories from other cities.
- None of the districts provided any documentation or testimonial evidence of providing DDACTS refresher orientations to officers in the districts.
- DPD has provided minimal information and no documentary evidence that they have a procedure to ensure that all personnel responsible for the implementation of DDACTS receive training. There is not a documented process to ensure that all officers hired since the roll-call briefings have been oriented, although some DDACTS training may be included in the recruit training. Additionally, there was no process in place to ensure that those who were absent during orientations received this training later. District 2 did state that DDACTS zone maps, times, and concepts would have remained in the roll-call packet for some time to ensure that this information is disseminated to all officers absent during the orientation.

Based on the limited training that was carried out as well as our interviews with DPD staff, we determined that there is a general lack of awareness and understanding within the department

[57] Tat-Kei Ho, Alfred and Cho, Wonhyuk, "Government Communication Effectiveness and Satisfaction with Police Performance: A Large-Scale Survey Study," *Public Administration Review* 77, No. 2 (2017): 237.

of DPD's DDACTS model. Some DPD employees do not understand the distinction between DDACTS and crime hot spot based policing.[58] Some do not know what DDACTS is. Others do not understand the principles of DDACTS or their role in implementation. For example, cooperation with partners and stakeholders is one of the key elements of DDACTS. However, many interviewed DDACTS employees stated that they are not aware of DDACTS partners and stakeholders, have not cooperated with them, and are not aware that this would be part of a DDACTS initiative. Thus, we conclude that DPD could improve its DDACTS training to ensure that all employees involved have a clear understanding of its concepts and implementation.

According to the Operational Guidelines' Principle IV – Strategic Operations, it is critical for police departments to conduct training on the DDACTS guiding principles and objectives. We looked at several cities and noted examples of police departments who implemented training for their officers. In Everett, Massachusetts, command staff took DDACTS training in 2011 and spent the next 12 months cleaning data, conducting analyses, preparing training materials, and delivering training to officers, and then began program implementation in July 2012. In Lansing, Michigan, the department struggled with officers perceiving that officer activity tracked for evaluating DDACTS may not be correctly reported because of the burden on officers in filling out the forms. To counter this possibility, the department held in-house educational training sessions devoted to the importance of DDACTS and completing the forms regularly and thoroughly.

Insufficient Internal Communication—In addition to training issues, we found that the DAU, the districts, and Traffic Operations are not effectively sharing information internally about DDACTS operations and results. First, we found that the year-one evaluation of their DDACTS model prepared in summer 2016 was not communicated to DPD district commanders or the Traffic Operations Unit until January 2017. We have no evidence that these results have been communicated to DPD district officers. Furthermore, although this report included some recommendations and considerations for changes, no discussion has occurred between the DAU and the districts regarding potential adjustments to the zones, tactics, strategies, and results. We also found insufficient communication between shifts and units regarding DDACTS activities. As observed during several officer ride-alongs, officers acknowledged that there is room for improvement in communication between shifts about what each shift did and did not do during all of their enforcement activities, including DDACTS. The officers cited lack of time as one reason why this type of communication does not occur as often as it should.

In addition, we determined that DDACTS is not discussed at DPD's main information sharing and accountability venue: its CORE meetings. DPD personnel explained that this is because CORE meetings focus on current crime activity and on short-term changes in crime and enforcement. When a crime change is discussed, district commanders have an opportunity to explain the reason for the changes and proactive measures to identify causes, prevent crime, and apprehend criminals. While we came across varying opinions on the usefulness and effectiveness of CORE for crime prevention, some commanders have shared that CORE is a good mechanism to exchange ideas and gain insights about effective enforcement. Therefore, CORE would be an appropriate venue for districts to discuss strategies, tactics, and collaboration opportunities to address the issues within the DDACTS zones.

[58] U.S. Department of Justice, National Institutes of Justice, *Hot Spot Policing Can Reduce Crime,* (Washington, DC, 2009), accessed May 22, 2017, https://www.nij.gov/topics/law-enforcement/strategies/hot-spot-policing/pages/welcome.aspx.

The DDACTS Operational Guidelines' Principle V recommends that police departments ensure continual communication and buy-in. Our research revealed that DDACTS has helped police departments throughout the U.S. improve communication and break down barriers within and between police units. We have seen in other DDACTS benchmark cities that police departments can share information about their initiatives. In Citrus Heights, California, monthly command staff meetings included discussing data as a problem-solving tool rather than an accountability meeting. Once they learned about DDACTS, they elevated the role of traffic within the department and incorporated the discussion of traffic into their meetings. Clear communication and frequent reporting of DDACTS results and activities has helped improve officers' buy-in in Everett, Washington. Everett police officers started receiving positive and frequent feedback about the outcomes of their efforts in DDACTS zones. Once reporting started, most officers wanted to ensure they were performing well in their enforcement zones.

Several Factors Contribute to the Inconsistent Execution of DPD's DDACTS Model

Our audit work revealed that for the Citywide DDACTS rollout, districts did not develop specific plans for how they would implement DDACTS. In many districts, only minimal communication of the DDACTS concept and objectives occurred. While district leadership distributed DDACTS zone maps and times to the district officers, some officers are still not familiar with the broader DDACTS strategy and how their daily activities align with their district's DDACTS strategy. In discussion with community outreach officers, we were not able to identify a communication plan for outreach to DPD DDACTS external stakeholders and partners.

Lack of Defined Roles and Responsibilities—Our audit work revealed a lack of defined roles and responsibilities surrounding the execution of DDACTS. Although DPD leadership tasked the DAU with designing and evaluating the DDACTS zones, they also determined that districts decide how to implement DDACTS. Accordingly, commanders were given authority and direction to tailor the model to their respective district's organizational structure and needs. Decisions have been left to individual interpretation, which may differ not only from district to district but even from person to person. This flexibility has allowed districts to adopt DDACTS to a vastly different extent, ranging from large operations and specific trainings to discontinuing the model completely. Although DPD does have DDACTS subject-matter experts in the districts, these DPD employees were not directed and authorized to lead the charge for DDACTS design, execution, and evaluation Citywide. Apart from a few instances in operational plans, DPD leadership did not define DDACTS-specific roles, responsibilities, and performance expectations for DPD personnel. Consequently, DDACTS execution was inconsistent across districts.

We observed a lack of defined roles and responsibilities surrounding the execution of DDACTS.

According to the Green Book, when establishing internal controls for any government entity, it is important for there to be an organizational structure including a key role with delegated authority and responsibility. This structure should be designed to support and encourage support of the entity's planning, execution, control, and evaluation in a consistent, efficient, and effective manner. It also emphasizes that management needs to delegate responsibility in order to achieve an entity's objectives. [59]

[59] U.S. Government Accountability Office, *Standards for Internal Control in the Federal Government,* GAO-14-704G (Washington, DC, 2014), 29, accessed April 7, 2017, http://www.gao.gov/assets/670/665712.pdf.

Lack of Buy-In of Police Department Personnel—Overall, we found low commitment to DDACTS among DPD leadership, who view DDACTS as just one strategy in a multitude of strategies. District commanders have ample discretion to decide on how to best use DDACTS tactics in responding to crimes in their districts. Some commanders have dedicated significant time and effort to ensuring the success of DDACTS, while others have only minimally embraced the DDACTS principles or discontinued use of the model entirely. The districts have neither tracked DDACTS activity nor documented their efforts for implementing DDACTS.

DPD May Not Achieve the Maximum Benefits of DDACTS Due to its Deficient Implementation

Because of not executing the DDACTS model in accordance with the Operational Guidelines, DPD may not achieve the maximum benefits of DDACTS in preventing or deterring crime and traffic accidents. In addition, minimal documentation and vague testimonial evidence do not allow us to draw conclusions about the costs, effectiveness, and efficiency of the model for crime and traffic accident prevention.

If DPD determines that it is beneficial and a department priority to continue the DDACTS model, it should establish clear roles and responsibilities. In addition, DPD should dedicate a resource to be responsible for the Citywide implementation of DDACTS and should significantly enhance its DDACTS communications efforts. In addition, to enhance the implementation of DDACTS, DPD should properly train employees and create frequent DDACTS status update reports. This would help to ensure that employees understand what DDACTS is, how it helps them in achieving DPD's goals, and what their role is in this model's implementation. DPD should adequately document its DDACTS implementation to allow for monitoring, evaluation, and adjustments.

RECOMMENDATION 1.4

DPD should establish roles and responsibilities for DDACTS execution allowing DPD employees to understand the extent of their responsibility.

Agency Response: Disagree

Auditor's Addendum: Exhibit A, p.41-42

RECOMMENDATION 1.5

DPD should dedicate a resource to be responsible for the Citywide DDACTS implementation.

Agency Response: Disagree

Auditor's Addendum: Exhibit A, p.41-42

RECOMMENDATION 1.6

DPD should improve and document training, reporting, and information sharing efforts to promote knowledge and acceptance of DPD's DDACTS model for personnel executing DDACTS.

Agency Response: Disagree

Auditor's Addendum: Exhibit A, p.41-42

DPD Does Not Know Whether DDACTS Is Effective Due to a Lack of Monitoring and Using Insufficient Measures of Officer Activity

With any program designed to achieve a certain outcome, it is necessary to frequently monitor short-term impacts as well as comprehensively evaluate long-term results to know whether the program is working. In assessing how DPD determines how well the DDACTS model is working, we found that DPD is not sufficiently monitoring, evaluating, and adjusting the model to understand its impact on crime and traffic accidents or ensure the model's success. This may be attributable to the fact that DPD command staff see the DDACTS model as a long-term initiative that does not require frequent monitoring or adjustment based on their professional judgment. Additionally, we noted deficiencies in the sufficiency and accuracy of the data used by DPD to perform their assessment of the DDACTS model.

DPD Does Not Regularly Monitor, Evaluate, or Adjust their DDACTS Model

Monitoring the DDACTS Model—Monitoring activities are essential for gathering the information that will be used to evaluate a program's performance. DPD is monitoring the short-term impact of their policing efforts in acute areas of crime through frequent analyses of officer activity and changes in crime by type that are discussed at CORE meetings. However, we found that DPD does not monitor their DDACTS-related activities to determine the short-term impact of their policing efforts in DDACTS zones, designated by the department as areas of chronic crime and traffic accidents. When asked, the DAU staff and individual DPD district commanders stated that they do not perform frequent monitoring of DDACTS to determine the impact of DDACTS within individual districts, such as a regular analysis of counts of crime and traffic accidents, and officer enforcement activities within DDACTS zones and surrounding areas. The DAU and district commanders explained that the only activity to assess the impact of their policing efforts in DDACTS zones was a year-one evaluation completed by the DAU in August of 2016 at the request of DPD operational command staff.

DPD is not monitoring DDACTS-related activities to determine the short-term impact of policing efforts in DDACTS zones.

Evaluating the DDACTS Model—A central part of program evaluation is comparing desired outcomes to actual outcomes. This can be done by using established performance measures. However, we found that DPD did not document desired outcomes or establish performance measures for DDACTS. In the absence of formal, documented outcomes and performance measures, we asked the DAU and district commanders about their desired DDACTS outcomes and how they would measure DDACTS as successful.

The DAU identified two desired DDACTS outcomes, which were included in their year-one evaluation of DDACTS, as follows:

1. An increase in proactive officer initiated activity (Class 2 activity) within the DDACTS zones during the specified times
2. A decrease in both crime and traffic accidents in the DDACTS zones during the specified times

DPD district commanders consistently noted the following desired outcomes:

1. A reduction in citizen calls for services (Class 1 activity)
2. An increase in proactive officer activity (Class 2 activity)
3. A decrease in crime in DDACTS zones

As previously discussed, we found that the only evaluation completed was the DAU's year-one evaluation of the DDACTS model. The DAU did use officer time spent on Class 1 and Class 2 activity and counts of crimes and traffic accidents in the evaluation.

Additionally, we found that districts were not involved in completing the year-one evaluation. DAU did not seek information on implementation or feedback on specific zones prior to completing this analysis. We also determined that the results of the DAU's year-one evaluation were not shared with district commanders until January 2017 and we found no evidence that the results of the evaluation were discussed in detail with the district commanders.

Adjusting the DDACTS Model—Finally, we sought to determine if the evaluation work revealed any adjustments that could be made to the DDACTS model to improve its effectiveness. The year-one evaluation completed by the DAU identified several adjustments to DDACTS zones for consideration such as:

1. Determining if the current zones are still good candidates for DDACTS based on outcomes;
2. Reducing the size of zones in several districts to allow for more highly focused and visible patrol efforts; and
3. Decreasing the number of DDACTS zones Citywide as 27 may not be sustainable.

DPD leadership explained that based on the year-one evaluation, they decided to not make any adjustments to DDACTS due to the perceived positive impacts throughout the City and DDACTS treatment as a long-term initiative. This decision was made prior to sharing the results of the evaluation with district commanders in January 2017. Several district commanders stated that they agreed with the recommendations of the evaluation to adjust the size of zones and reduce the number of zones. They also believed the times of targeted enforcement within the zones could be increased. However, district commanders did not communicate their recommendations to DPD leadership for additional consideration when determining if adjustments to DDACTS were necessary.

In assessing the cause of DPD's insufficient monitoring, evaluation, and adjustment of the DDACTS model, we point to the fact that DPD does not have written plans or processes to carry out such activities. Furthermore, specific roles and responsibilities related to the monitoring and evaluation of the DDACTS program were not clearly defined among the DAU, district commanders, and district crime analysts. The lack of department strategic DDACTS planning and the undefined roles and responsibilities may have also contributed to the DAU failing to communicate the results of their year-one evaluation of the DDACTS program to the district

commanders in a timely manner and failing to solicit feedback on potential adjustments. All this indicates that DDACTS is not a priority for DPD.

The DDACTS Operational Guidelines' Principle VI suggest that police departments develop a plan to use in monitoring, evaluating, and adjusting DDACTS activities. This plan includes key elements such as a need for data or information to conduct regular evaluations (daily, weekly, monthly, or as needed); information sharing between operational personnel and analysts; and supervisor accountability for managing DDACTS efforts to allow for adjustments to enforcement measures and the deployment of officers.[60] Therefore, DPD should identify how often DDACTS monitoring and evaluation should occur and ensure the roles and responsibilities of district operational personnel and the DAU are clearly defined.

RECOMMENDATION 1.7

DPD should monitor, evaluate, and adjust its DDACTS model. Specifically, the frequency of DDACTS monitoring or evaluation and the roles and responsibilities of the DAU and district operational personnel in these activities should be defined.

Agency Response: Disagree

Auditor's Addendum: Exhibit A, p.41-42

The DAU Does Not Use Sufficient Information or Analyses to Evaluate the DDACTS Model

The DAU evaluated the DDACTS model one year after its implementation. For their analysis, the DAU compared officer time, crime, and traffic accident data within each DDACTS zone from the first DDACTS year beginning in May of 2015 to the previous three-year average. While the DAU concluded in their evaluation that, on average, an increase in officer activity resulted in an expected decrease in crime and traffic accidents, they also acknowledged that they could not explain unexpected changes in crime or traffic accidents within specific DDACTS zones. For example, in some DDACTS zones the DAU's analysis showed an increase in officer time and an increase in crime or traffic accidents. The year-one evaluation concludes that a more in-depth analysis is needed to evaluate what other variables may impact crime and traffic accidents in these zones, such as population changes, businesses opening or closing, and large infrastructure projects. Further, we conclude that, in addition to officer time, the DAU should use more measures of enforcement to evaluate how DPD's efforts affect crime or traffic accidents.

Our review of other communities' DDACTS evaluation reports and the DDACTS Operational Guidelines' Principle VI – Monitoring, Evaluation, and Adjustments identified other commonly used measures for determining the impact of policing efforts, such as DDACTS, including the following:[61]

[60] U.S. Department of Transportation, National Highway Traffic Safety Administration, *Data Driven Approaches to Crime and Traffic Safety (DDACTS): Operational Guidelines*, Report No. DOT HS 811 185, (Washington, DC, 2014), 22.

[61] David McClure, Jeremy Levy, Nancy La Vigne, David Hayeslip, "DDACTS Evaluability Assessment: Final Report on Individual and Cross-Site Findings", Urban Institute, August 2014.

- Number of traffic citations issued
- Number of traffic warnings given
- Number of arrests made
- Number of crimes committed, by type
- Number of citizen contacts made

We found that much of this information was available but not used by the DAU in conducting the year-one evaluation. Specifically, DPD's Traffic Operations Bureau had been recording the number of arrests, citations, and warnings officers completed while in DDACTS zones since May of 2015. Additionally, district patrol officers had been collecting data on arrests, citations, warnings, and other similar enforcement activities. Finally, the DAU could have examined the change in specific crime types when evaluating the effectiveness of DDACTS.

Furthermore, we recognize that there are several ways that DPD could improve their analyses to evaluate DDACTS effectiveness. The following is a list of examples:

- **Enforcement During Non-DDACTS Times**—Although the districts and Traffic Operations routinely carry out DDACTS activities in DDACTS zones outside of the times most recommended for targeted enforcement, the DAU's evaluation did not include the officer efforts (outputs) and crime and traffic accidents (outcomes) in DDACTS zones outside of those times. Including analysis of outputs and outcomes during and outside of the designated times would help evaluate the effectiveness of all efforts. It may also help evaluate whether crime and traffic accidents have reduced or shifted to less-enforced times.
- **Assess Additional Variables**—The DAU only analyzed the impact of Class 1 and Class 2 enforcement time on crime and traffic accident count. The Government Accountability Office (GAO) states that the outcomes observed typically reflect a combination of influences of various factors such as population change, economic conditions, environmental design change, other policing efforts or government programs.[62] GAO recommends designing evaluations "to isolate the program's unique impacts, or contribution to those outcomes, [...] to rule out plausible alternative explanations for the results."[63]
- **Crime Displacement**—The DAU did not compare the outcomes in DDACTS zones to crime and accident numbers in the districts. Such an analysis could be used to help evaluate whether crime and traffic accidents have moved or spread to areas outside of the DDACTS zones.
- **Time-Series Analysis**—The DAU's evaluation only compared the average annual number of crimes and traffic accidents with the number during DDACTS year. DDACTS effectiveness evaluation can be improved by incorporating a time-series analysis of crime and traffic accident hot spots. Crime researchers have shown that time-series analysis can be used to improve a jurisdiction's understanding of changes in crime.[64] For

[62] Environmental design changes include changes in speed limits, intersection design, and traffic signs.
[63] U.S. Government Accountability Office, *Designing Evaluations,* GAO-12-208G (Washington, DC, 2012), 39.
[64] Elizabeth, R. Groff, David Weisburd, and Su-Ming Yang, "Is it Important to Examine Crime Trends at a Local "Micro" Level", *Journal of Quantitative Criminology* 26 (2010): 10, 24-25 ; Hope Corman and H. Naci Mocan, "A Time-Series Analysis of Crime,

example, all other variables being equal, crime could have decreased in a DDACTS zone over the past three years and continue that decrease at the same pace in the following DDACTS year. This could be an example of officer DDACTS activity not having an impact on the decrease. Additionally, if the DAU incorporates time-series analysis into the spatial analysis that they are already performing for the DDACTS model, they will be better equipped to determine whether crime and traffic accidents are actually being reduced based on what they are seeing within the DDACTS zones or if the crimes are just being displaced to other areas of the City.[65]

Until DPD begins using a broader array of performance measures, DPD's ability to evaluate DDACTS will continue to be limited.

The DAU's Officer Time Data Is Not Reliable as a Measure for Evaluating DDACTS

In addition to finding that DPD can improve the sufficiency of the data it uses to evaluate the DDACTS model, we also found some areas for improvement regarding the sources of data used in their evaluation of the DDACTS model. As previously mentioned, the DAU used data from two sources of data to conduct their evaluation of DDACTS: the CAD system and RMS (See Appendix E for a flowchart summarizing these sources). DAU used the CAD system to obtain data about officer time associated with Class 1 (citizen initiated) and Class 2 (officer initiated) activity in DDACTS zones. DAU used RMS to obtain crime statistics and traffic statistics in DDACTS zones.

We believe that it was reasonable for the DAU to rely on the accident and crime data from RMS. We also assessed the CAD system, which the DAU used to pull officer activity time data. However, we found the CAD system was not designed appropriately to collect data on officer time that is reliable for the purposes of evaluating Class 1 or Class 2 officer enforcement activities.[66] We found several instances where inaccuracies could impact the ability of the DAU to determine the effectiveness of DDACTS by relying solely on officer enforcement activity time from CAD as a measure.

- **Class 1 Start Times May Be Inaccurate** – For citizen initiated activity time (Class 1), both the DAU and a prior audit report released by this office identified that officers do not always notify the CAD dispatcher of their arrival on the scene to establish an accurate start of the Class 1 activity time. In these instances, the DAU uses the time that the officer was assigned to the Class 1 activity. This alternative method thus includes the time that it took the officer to travel to the location.
- **Class 1 End Times May Be Inaccurate** – We also found that the end time for Class 1 activities is not always accurately captured. Based on our review of officer activity logs, which are generated using CAD time data, we noticed that some officer activities

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Deterrence, and Drug Abuse in New York City", *The American Economic Review* 90 (2000): 584 and 601; Lisa Tompson, "Advanced time-series analysis", (presented at the International Crime and Intelligence Analysis Conference, Fort Lauderdale, Florida, September 9-12, 2013), 4 and 16-20; International Association of Crime Analysts, "Identifying High Crime Areas" White Paper 2013-02 (Overland Park, KS, 2013), 6-7, and 11.

[65] International Association of Crime Analysts, "Identifying High Crime Areas" White Paper 2013-02 (Overland Park, KS, 2013), 11.

[66] Reliable data refers to data that "are reasonably complete and accurate, meet your intended purposes, and are not subject to inappropriate alteration." U.S. Government Accountability Office, *Assessing the Reliability of Computer-Processed Data,* GAO-09-680G (Washington, DC, 2002), 5, accessed May 30, 2017, http://www.gao.gov/new.items/d09680g.pdf

overlap. In one case, an officer was assigned a low priority Class 1 activity when he saw a citizen making an illegal left turn. The officer called into dispatch and conducted a Class 2 activity traffic stop without first reporting that he had cleared the Class 1 activity. After the traffic stop, the officer closed both the Class 1 and Class 2 activities. We found that both activities were counted towards the officer's time on the activity log even though the times overlapped. Instances such as this lead to inaccurate activity end times being reported and officer time being counted twice.

- **Class 3 Activities May Be Counted as Class 1** – Additionally, we discovered that officers often wait to close out Class 1 activities in CAD to take care of actions of a non-police nature (Class 3 activities). One officer explained that it would not be uncommon to be assigned by a CAD dispatcher to multiple Class 1 activities at one time, leaving little time to take authorized breaks between clearing one Class 1 call and responding the next. As the DPD operations manual requires that officers only notify the CAD dispatcher of long (30 minute) breaks and short (15 minute) breaks, officers routinely include any time spent on breaks that is less than 15 minutes in their Class 1 activity time.[67]
- **Class 3 Activities May Be Counted as Class 2** – With regard to officer initiated activity time (Class 2), we discovered that officers are including Class 3 activities in their Class 2 activity time reported in CAD. In a review of an officer CAD activity log corresponding to one of our officer ride-alongs, we noted the officer included time for a meeting with the City Attorney's Office within a five-hour block of Class 2 activity time. As the DPD Operations Manual identifies similar time such as that for court activities as a Class 3 activity, the officer's Class 2 activity time was overstated by an unknown amount.
- **Class 2 Activity Start Times Not Always Recorded Timely** – Finally, for officer initiated activity time (Class 2), we determined that start times were not always accurately recorded. We also observed that officers did not always promptly notify the CAD dispatcher of start times for officer initiated activity. These examples included two instances where CAD identified the start time later than the actual start time of the activities. The first was a vehicle stop that was recorded in CAD 28 minutes after the actual start time, and the second was a citizen contact that was recorded in CAD 31 minutes after the actual start time.

In addition to these issues, we also determined that the processes used for reviewing officer activity logs generated by CAD could be improved to ensure the accuracy of documented officer enforcement activities. The use of officer activity logs based on CAD data is a new process as officers used to manually document time and enforcement activities within logs during their shifts for comparison to data contained in RMS. As such, the review process for the newly created CAD officer activity logs was not being used to correct inaccuracies with officer enforcement activity time in CAD. The review process involves comparing the CAD activity logs to officer enforcement activities documented in RMS to only correct inaccuracies in RMS. The DAU acknowledged these limitations with CAD data and explained that the primary purpose of the CAD system is not to collect data for evaluation, but to dispatch officers effectively and to allow dispatchers to know officers' locations for safety reasons.

Using data that is reliable for its intended purposes is a foundational element of DDACTS and data driven policing strategies. This principle is echoed both within the DDACTS Operational

[67] Of the seven daily activity sheets we reviewed, six did not contain any administrative (Class 3) time.

Guidelines and by governmental standards. Specifically, the DDACTS Operational Guidelines' Principle II – Data Collection deems it critical that "accurate, timely, and complete data is collected for analyses to monitor and evaluate the impact of DDACTS."[68] Additionally, governmental standards on internal control state that management should process data from reliable sources to make informed decisions and evaluate performance in achieving key objectives.[69] As such, DPD and the DAU should ensure that data used for the evaluation of DDACTS is reliable, thus enabling them to draw reliable conclusions regarding the effectiveness on the model.

RECOMMENDATION 1.8

To improve its process for monitoring and evaluating the effectiveness of DDACTS, the DAU should use additional commonly accepted performance measures and conduct additional analyses for determining the impact of policing efforts.

Agency Response: Disagree

Auditor's Addendum: Exhibit A, p.41-42

RECOMMENDATION 1.9

DPD should design and test the implementation of internal controls surrounding the data reliability for any data used for its DDACTS model and document that process.

Agency Response: Disagree

Auditor's Addendum: Exhibit A, p.41-42

[68] U.S. Department of Transportation, National Highway Traffic Safety Administration, *Data Driven Approaches to Crime and Traffic Safety (DDACTS): Operational Guidelines*, Report No. DOT HS 811 185, (Washington, DC, 2014), 12.
[69] U.S. Government Accountability Office, *Standards for Internal Control in the Federal Government,* GAO-14-704G (Washington, DC, 2014), 60, accessed April 7, 2017, http://www.gao.gov/assets/670/665712.pdf.

RECOMMENDATIONS

The following are recommendations for DPD to consider for improving the design, implementation, and evaluation of its DDACTS model:

1.1 **Commitment to DDACTS** – DPD command staff should determine whether the department will continue using DDACTS as a model to efficiently and effectively allocate resources to support its mission to prevent crime.

Auditee Response: Disagree

The DPD command staff will not implement the DDACTS model as recommended by the Auditor's Office. DPD will continue to improve our methods and continue to borrow from the DDACTS guidelines if and when they are useful in achieving DPD goals.

DPD emphasized individual initiative and accountability in patrolling areas and reducing crime and disorder. To that end, DPD endeavors to reach a departmental goal of 35% proactive time per officer, allowing for self-directed activities. Officers pair information gleaned from experience with data analytics to best utilize available proactive time. As part of that, it is imperative that our officers know where and when chronic crime and accidents occur. The Data Analysis Unit will continue to leverage technology and proven methods to offer various crime reduction/prevention strategies.

Due to the variability of crime, traffic issues, and social needs within the City and County of Denver, an equally variable set of tools is necessary. Officers and command staff need options, not just DDACTS, to address chronic problems as well as other patterns and emerging issues. As stated in the DDACTS Evaluability Assessment through the Urban Institute,

> *"DDACTS leadership has stressed that DDACTS is a model of a process, not a program. This is a very important point to recognize, as it affect the form of DDACTS implemented in each jurisdiction. Additionally, being built around general principles, rather than specific program components, provides a great deal of flexibility for sites to tailor their programs to the specific characteristics of their jurisdictions."*

(Urban Institute: Justice Policy Center for the US Department of Justice, DDACTS Evaluability Assessment: Final Report of Individual and Cross-Site Findings, June 2014, p.3)

While the DPD recognizes there is always room for improvement, we also recognize that within our current use of the DDACTS model, overall DDACTS time and areas have shown a decrease in crime and accidents (Appendix D) at a greater rate than citywide.

1.2 **DDACTS Documentation within Department's Strategy** – If DPD command staff decides to continue pursuing the DDACTS model, improvements should be made to the integration of DDACTS into the department's overall strategy by establishing

clear objectives and performance measures, defining roles and responsibilities, and describing the relationship of DDACTS with other short-term policing initiatives.

Auditee Response: Disagree

The DPD command staff will not implement the DDACTS model as recommended by the Auditor's Office. DPD will continue to improve our methods and continue to borrow from the DDACTS guidelines if and when they are useful in achieving DPD goals.

1.3 **Additional Analyses for DDACTS Zone Design** – The DAU should conduct additional analyses using available crime and traffic accident data, as suggested by the DDACTS Operational Guidelines. The DAU should then determine whether the additional analyses warrant changing or refining existing DDACTS zone boundaries. We recommend that the following two specific analyses be conducted:

First, the DAU should use spatial analyses to identify crime and traffic accident hot spots separately, and then determine where crime and traffic accidents overlap.

Second, the DAU should determine whether specific crime are associated with each DDACTS zone and provide that information to the appropriate DPD operations personnel.

Auditee Response: Disagree

The DPD command staff will not implement the DDACTS model as recommended by the Auditor's Office. DPD will continue to improve our methods and continue to borrow from the DDACTS guidelines if and when they are useful in achieving DPD goals.

1.4 **Roles and Responsibilities** - DPD should establish roles and responsibilities for DDACTS execution allowing DPD employees to understand the extent of their responsibility.

Auditee Response: Disagree

The DPD command staff will not implement the DDACTS model as recommended by the Auditor's Office. DPD will continue to improve our methods and continue to borrow from the DDACTS guidelines if and when they are useful in achieving DPD goals.

1.5 **Key Resource** - DPD should dedicate a resource to be responsible for the Citywide DDACTS implementation.

Auditee Response: Disagree

The DPD command staff will not implement the DDACTS model as recommended by the Auditor's Office. DPD will continue to improve our methods and continue to borrow from the DDACTS guidelines if and when they are useful in achieving DPD goals.

1.6 **Training, Reporting, Information Sharing** - DPD should improve and document training, reporting, and information sharing efforts to promote knowledge and acceptance of DPD's DDACTS model for personnel executing DDACTS.

Auditee Response: Disagree

The DPD command staff will not implement the DDACTS model as recommended by the Auditor's Office. DPD will continue to improve our methods and continue to borrow from the DDACTS guidelines if and when they are useful in achieving DPD goals. However, DPD will enhance the training module in the academy Crime Analysis class to include more detailed information about DDACTS. In addition, when appropriate to fulfill district initiatives, additional training will be available to corporals who provide training and guidance to patrol officers.

1.7 **Monitoring, Evaluation, Adjustments** - DPD should monitor, evaluate, and adjust its DDACTS model. Specifically, the frequency of DDACTS monitoring or evaluation and the roles and responsibilities of the DAU and district operational personnel in these activities should be defined.

Auditee Response: Disagree

The DPD command staff will not implement the DDACTS model as recommended by the Auditor's Office. DPD will continue to improve our methods and continue to borrow from the DDACTS guidelines if and when they are useful in achieving DPD goals.

1.8 **Additional Performance Measures and Analyses** - To improve its process for monitoring and evaluating the effectiveness of DDACTS, the DAU should use additional commonly accepted performance measures and conduct additional analyses for determining the impact of policing efforts.

Auditee Response: Disagree

The DPD command staff will not implement the DDACTS model as recommended by the Auditor's Office. DPD will continue to improve our methods and continue to borrow from the DDACTS guidelines if and when they are useful in achieving DPD goals.

1.9 **Data Reliability** - DPD should design and test the implementation of internal controls surrounding the data reliability for any data used for its DDACTS model and document that process.

Auditee Response: Disagree

The DPD command staff will not implement the DDACTS model as recommended by the Auditor's Office. DPD will continue to improve our methods and continue to borrow from the DDACTS guidelines if and when they are useful in achieving DPD goals.

EXHIBIT

Exhibit A – *Auditor's Addendum*

DPD's response to the audit report does not address any of the recommendations provided but instead continually asserts that "The DPD command staff will not implement the DDACTS model as recommended by the Auditor's Office." More specifically, DPD states in its response that "Officers and command staff need options, not just DDACTS, to address chronic problems as well as other patterns and emerging issues." Nowhere in our report, however, do we suggest that DDACTS should be DPD's primary or only data-driven policing initiative. Our report simply recommends improvements to the model's adoption based on leading practices and guidance. In fact, our office applauds DPD's efforts to incorporate many data-driven policing strategies in its short-term operations. We believe that if an agency is going to implement a formal initiative, it should do that with as much care and diligence as possible.

Although the DDACTS process model allows law enforcement jurisdictions to build their own DDACTS initiatives around general principles and with a great deal of flexibility, DPD simultaneously has an obligation to implement any model—DDACTS or otherwise—efficiently, effectively, and economically. Accordingly, our recommended improvements were designed to help DPD be more accountable for how it is spending taxpayer resources on the DDACTS effort. Further, the recommendations were intended to help DPD demonstrate the effectiveness of the DDACTS model in coordination with other data-driven policing initiatives. Thus, we asked DPD leadership to analyze whether they want to continue using DDACTS as an initiative, since we identified several shortcomings and were told on many occasions by DPD that DDACTS is insignificant as a tool. Given this perceived internal insignificance and demonstrated lack of commitment to the success of the model, auditors logically questioned whether DDACTS warrants continued resource allocation.

Additionally, the response from DPD points out that "Officers pair information gleaned from experience with data analytics to best utilize available proactive time. As part of that, it is imperative that our officers know where and when chronic crime and accidents occur." This response to Recommendation 1.1 is concerning considering that auditors witnessed a lack of awareness and understanding of DDACTS among DPD employees. DPD leadership even acknowledges in their response to Recommendation 1.6 a need for enhanced training and more detailed information about DDACTS for officers executing DDACTS principles.

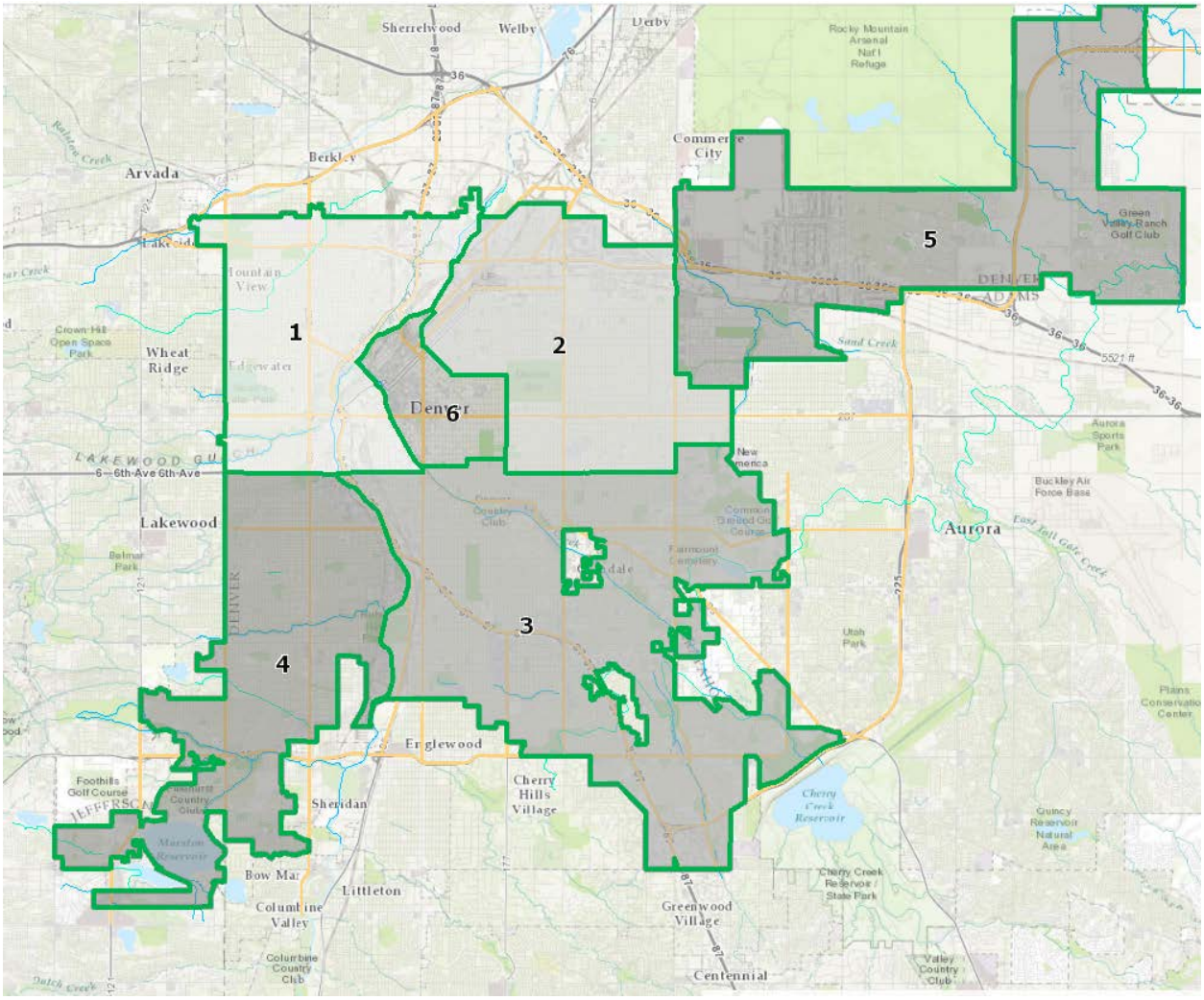
DPD wants to "…continue to borrow from the DDACTS guidelines if and when they are useful in achieving DPD goals" but does not see a need to explain or demonstrate which principles it will use, how a chosen principle will work in tandem with other efforts, and how each principle aligns with DPD's goals. DDACTS guidelines are flexible, and we acknowledge that repeatedly in the report. However, flexibility should not be understood to translate to lack of training, communication, and coordination with other policing initiatives. DPD and its districts have the freedom to tailor the DDACTS principles to meet their needs, but we did not obtain any evidence that DPD has strategically analyzed how the principles should be applied in Denver.

We acknowledge the difficulty of assessing cause and effect in crime prevention and reduction. However, this reality should not preclude DPD from creating and using a framework that aids in the evaluation of policing effectiveness. In its response, DPD points out that "…overall DDACTS times and areas have shown a decrease in crime and accidents (Appendix D) at a greater rate than citywide." While this is true, our audit report points out that DPD cannot evaluate whether

crime and accidents have been displaced to other areas. In addition, DPD's DDACTS year-one evaluation shows unexpected results in several DDACTS zones, such as a decrease in policing efforts and a decrease in crime and accidents. Therefore, we believe that DPD cannot conclude that their DDACTS efforts are effective at reducing crime using their current measures.

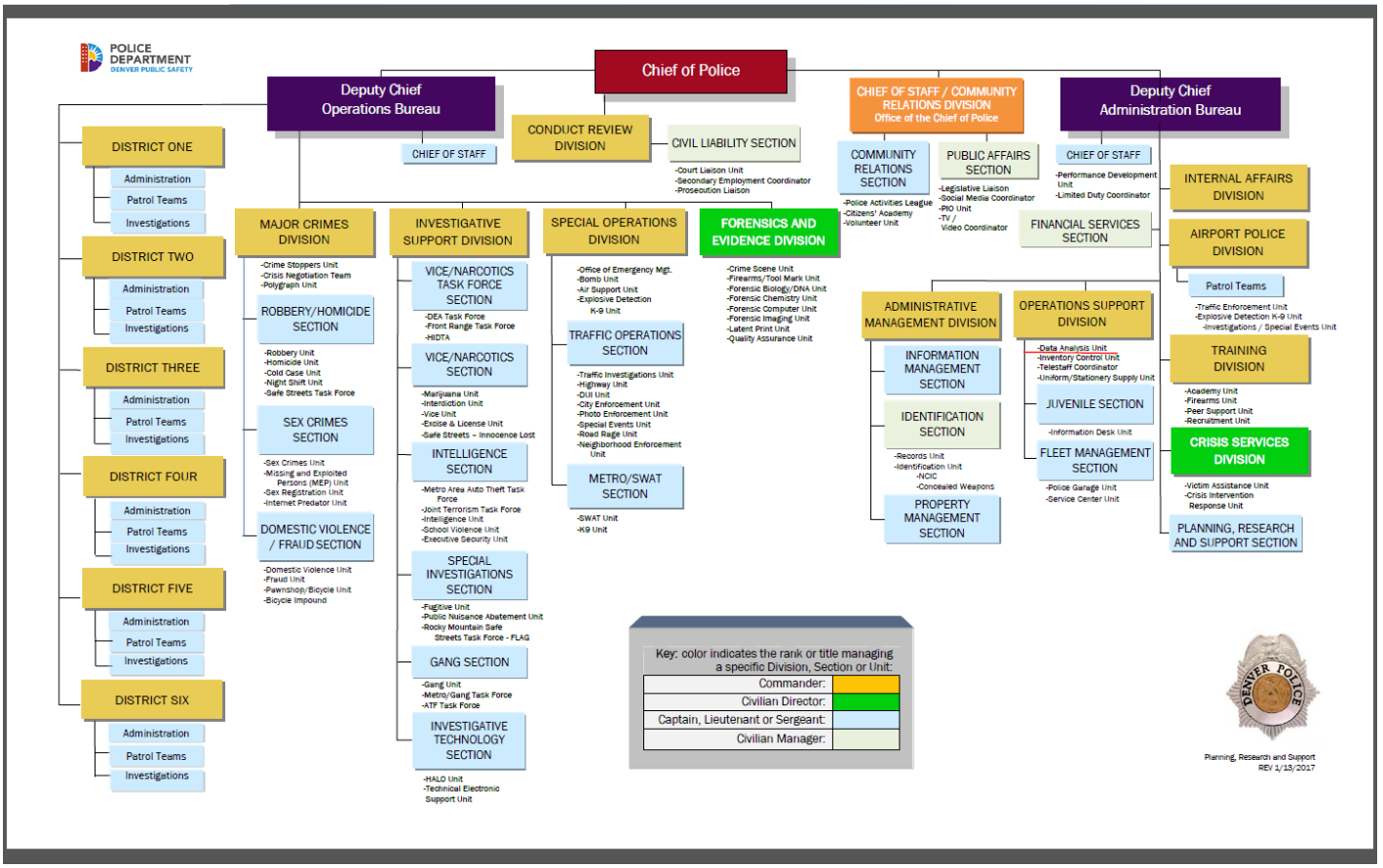
APPENDICES

Appendix A – Denver Police Districts



Source: Map It Denver, generated on April 17, 2017.

Appendix B – Denver Police Department Organizational Chart



Source: Denver Police Department Website (obtained on April 17, 2017).
Note: The chart is dated January 13, 2017.

Appendix C – DDACTS Guiding Principles

DDACTS Operational Guidelines recommend procedures and operational considerations based on best practices in the field for seven guiding principles:[70]

I. **Partners and Stakeholders Participation**—Identify and contact DDACTS partners and stakeholders and plan for their participation. Partners and stakeholders could be other law enforcement and city or state agencies, non-profit and community organizations, various units within PD, and PD employees in general.

II. **Data Collection**—Evaluate the existing data collection, analysis, and mapping tools and processes and assess data reliability. Create a data collection plan to ensure all the data needed for DDACTS would be available, timely, and reliable.

III. **Data Analysis**—Develop a clear process for data analysis to a) identify DDACTS hot spots and times, b) prepare regular DDACTS reports, and c) evaluate the model's effectiveness. Analysis products should be actionable.

IV. **Strategic Operations**—Identify strategies and tactics, develop and implement an operational plan. Hot spot analysis guides the realignment of workflow and assignments to focus highly visible traffic and other enforcement efforts at the most appropriate places and times.

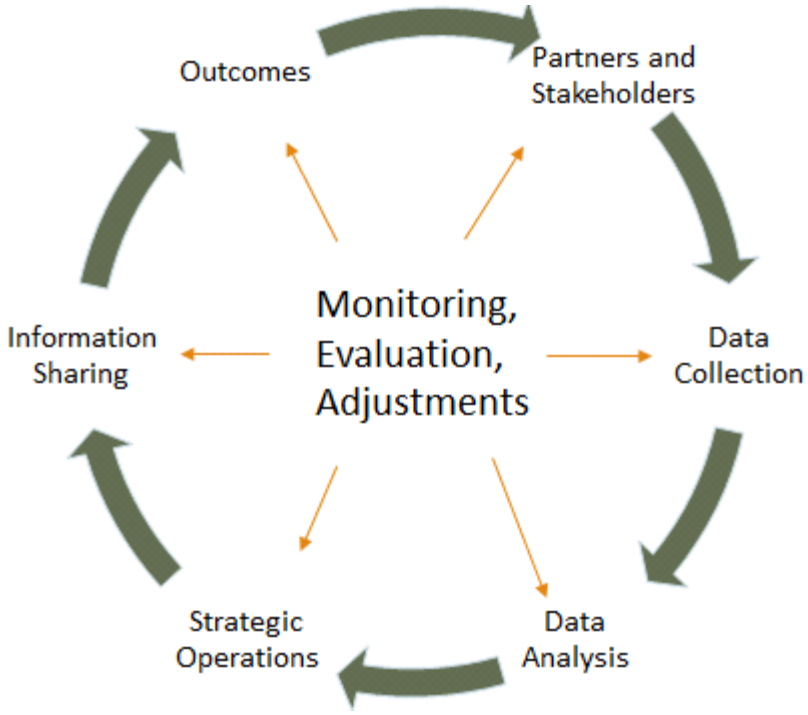
V. **Information Sharing and Outreach**—Information sharing should be aligned with the partner/stakeholder plan and include sharing comprehensive results and actionable information internally and externally, promote community participation, document accomplishments, and keep the general public informed.

VI. **Monitoring, Evaluation, and Adjustments**—Data analyses and evaluation should be prepared and used to inform of the model's effectiveness and to adjust strategic operations.

VII. **Outcomes**—Identify areas for monitoring and evaluation, develop outcome measures, identify monitoring and evaluation methods, and assign responsibilities. The DDACTS model supports increased measurement of outcomes and decreased measurement of outputs.

Based on the DDACTS Operational Guidelines, Denver Auditor's Office has prepared a figure to illustrate how these principles work together.

[70] NHTSA, *Data-Driven Approaches to Crime and Traffic Safety (DDACTS) Operational Guidelines* (National Highway Traffic Safety Administration (NHTSA), 2014).


Outcomes
Partners and Stakeholders
Monitoring, Evaluation, Adjustments
Information Sharing
Data Collection
Strategic Operations
Data Analysis

Appendix D – Crime and Traffic Accident Count Before and After DDACTS

Table 3 below shows the Data Analysis Unit's analysis of annual crime and traffic accident counts within the DDACTS zones and times. The Pre-Average columns show the average count of incidents between May 1, 2012 and April 30, 2015. The Active columns show the count incidents between May 1, 2015 and April 30, 2016. According to the DAU's analysis, District 6 had the highest Pre-Average count of crimes within their DDACTS zones and times at 805 and District 5 had the lowest Pre-Average count at 52.

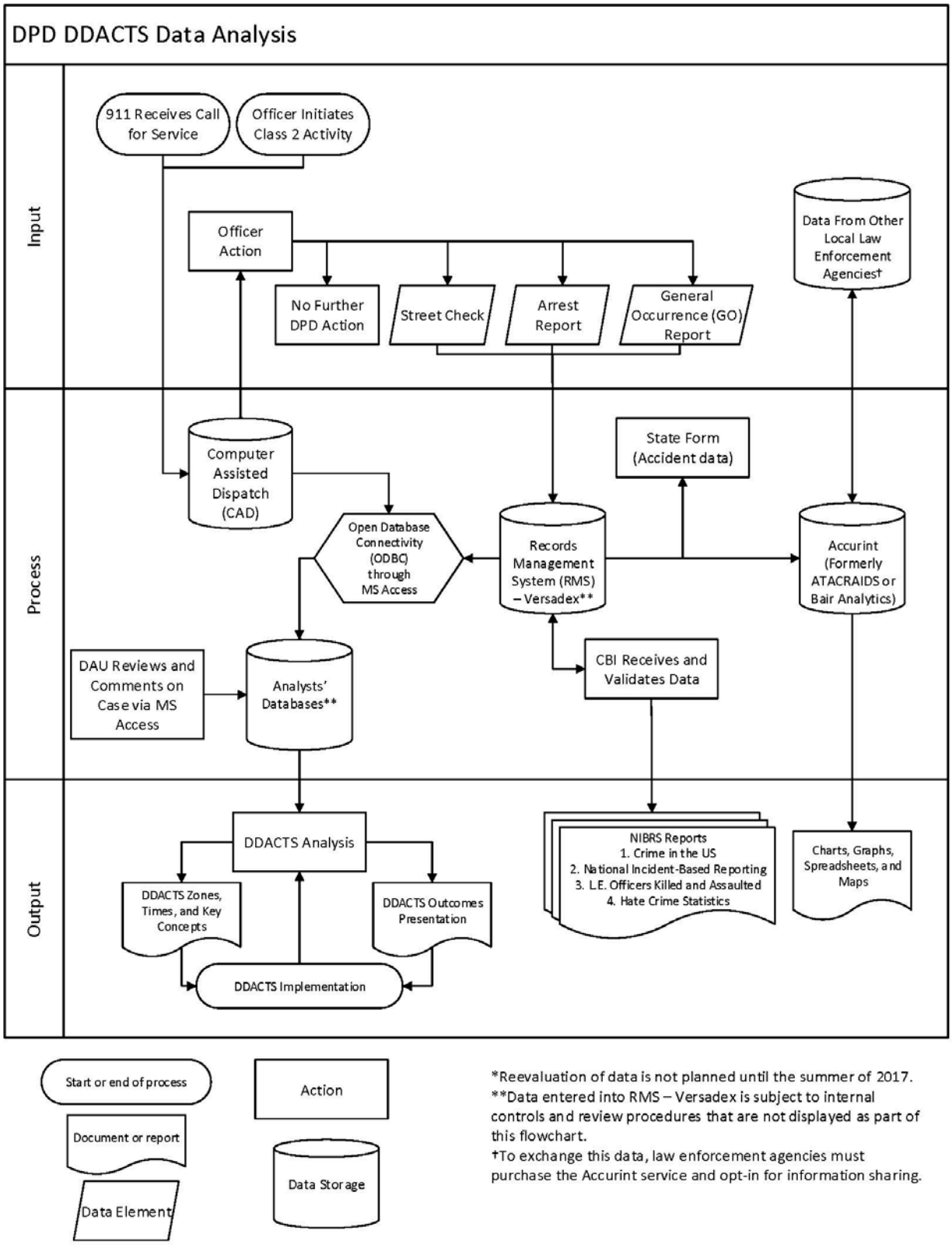
TABLE 3. DAU's analysis of average annual crime and accidents within DDACTS zones and times

Crime and Accidents within DDACTS Areas and Times									
Number of Incidents, Previous Three-Year Average versus Active Year									
District	Crime			Accidents			Both Crime and Accidents		
	Pre Average	Active	% Change	Pre Average	Active	% Change	Pre Average	Active	% Change
1	150	136	-9.1%	126	126	0.0%	275	262	-4.8%
2	213	193	-9.5%	78	62	-20.9%	292	255	-12.6%
3	174	147	-15.4%	258	240	-6.9%	431	387	-10.3%
4	107	72	-32.7%	91	71	-22.0%	198	143	-27.8%
5	52	44	-15.9%	77	70	-9.1%	129	114	-11.9%
6	805	748	-7.0%	241	216	-10.4%	1,046	964	-7.8%
Total	1,501	1,340	-10.7%	871	785	-9.8%	2,371	2,125	-10.4%

Source: The Data Analysis Unit's "Denver Police DDACTS: Year 1" report.

Note: No audit work was done to verify the analysis.

Appendix E – Sources of Data Used for DPD's DDACTS Model



Source: Created by the Auditor's Office based on interviews and walkthroughs.

AGENCY RESPONSE

POLICE DEPARTMENT
DENVER PUBLIC SAFETY

Stephanie Y. O'Malley, J.D.
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June 6, 2017

Auditor Timothy O'Brien, CPA
Office of the Auditor
City and County of Denver
201 West Colfax Avenue, Dept. 705
Denver, Colorado 80202

Dear Mr. O'Brien,

The Office of the Auditor has conducted a performance audit of the Denver Police Department's Data-Driven Approaches to Crime and Traffic Safety Model.

This memorandum provides a written response for each reportable condition noted in the Auditor's Report final draft that was sent to us on May 30, 2017. This response complies with Section 20-276 (c) of the Denver Revised Municipal Code (D.R.M.C.).

AUDIT FINDING
Benefits of the DDACTS model have not been fully realized due to shortcomings in design, implementation, and evaluation.

RECOMMENDATION 1.1

DPD command staff should determine whether the department will continue using DDACTS as a model to efficiently and effectively allocate resources to support its mission to prevent crime.

Agree or Disagree with Recommendation	Target date to complete implementation activities (Generally expected within 60 to 90 days)	Name and phone number of specific point of contact for implementation
Disagree	NA	NA

Narrative for Recommendation 1.1
The DPD command staff will not implement the DDACTS model as recommended by the Auditor's Office. DPD will continue to improve our methods and continue to borrow from the DDACTS guidelines if and when they are useful in achieving DPD goals.

DPD emphasizes individual initiative and accountability in patrolling areas and reducing crime and disorder. To that end, DPD endeavors to reach a departmental goal of 35% proactive time per officer, allowing for self-directed activities. Officers pair information

Page 1 of 6

gleaned from experience with data analytics to best utilize available proactive time. As part of that, it is imperative that our officers know where and when chronic crime and accidents occur. The Data Analysis Unit will continue to leverage technology and proven methods to offer various crime reduction/prevention strategies.

Due to the variability of crime, traffic issues, and social needs within the City and County of Denver, an equally variable set of tools is necessary. Officers and command staff need options, not just DDACTS, to address chronic problems as well as other patterns and emerging issues. As stated in the DDACTS Evaluability Assessment through the Urban Institute,

> *"DDACTS leadership has stressed that DDACTS is a model of a process, not a program. This is a very important point to recognize, as it affects the form of DDACTS implemented in each jurisdiction. Additionally, being built around general principles, rather than specific program components, provides a great deal of flexibility for sites to tailor their programs to the specific characteristics of their jurisdictions."*

(Urban Institute: Justice Policy Center for the US Department of Justice, *DDACTS Evaluability Assessment: Final Report on Individual and Cross-Site Findings*, June 2014, p.3)

While the DPD recognizes there is always room for improvement, we also recognize that within our current use of the DDACTS model, overall DDACTS times and areas have shown a decrease in crime and accidents (Appendix D) at a greater rate than citywide.

RECOMMENDATION 1.2

If DPD command staff decides to continue pursuing the DDACTS model, improvements should be made to the integration of DDACTS into the department's overall strategy by establishing clear objectives and performance measures, defining roles and responsibilities, and describing the relationship of DDACTS with other short-term policing initiatives.

Agree or Disagree with Recommendation	Target date to complete implementation activities (Generally expected within 60 to 90 days)	Name and phone number of specific point of contact for implementation
Disagree	NA	NA

Narrative for Recommendation 1.2

The DPD command staff will not implement the DDACTS model as recommended by the Auditor's Office. DPD will continue to improve our methods and continue to borrow from the DDACTS guidelines if and when they are useful in achieving DPD goals.

RECOMMENDATION 1.3

The DAU should conduct additional analyses using available crime and traffic accident data, as suggested by the DDACTS Operational Guidelines. The DAU should then determine whether the additional analyses warrant changing or refining existing DDACTS zone boundaries. We recommend that the following two specific analyses be conducted:

First, the DAU should use spatial analyses to identify crime and traffic accident hot spots separately, and then determine where crime and traffic accidents overlap.

Second, the DAU should determine whether specific crimes are associated with each DDACTS zone and provide that information to the appropriate DPD operations personnel.

Agree or Disagree with Recommendation	Target date to complete implementation activities (Generally expected within 60 to 90 days)	Name and phone number of specific point of contact for implementation
Disagree	NA	NA

Narrative for Recommendation 1.3

The DPD command staff will not implement the DDACTS model as recommended by the Auditor's Office. DPD will continue to improve our methods and continue to borrow from the DDACTS guidelines if and when they are useful in achieving DPD goals.

RECOMMENDATION 1.4

DPD should establish roles and responsibilities for DDACTS execution allowing DPD employees to understand the extent of their responsibility.

Agree or Disagree with Recommendation	Target date to complete implementation activities (Generally expected within 60 to 90 days)	Name and phone number of specific point of contact for implementation
Disagree	NA	NA

Narrative for Recommendation 1.4

The DPD command staff will not implement the DDACTS model as recommended by the Auditor's Office. DPD will continue to improve our methods and continue to borrow from the DDACTS guidelines if and when they are useful in achieving DPD goals.

RECOMMENDATION 1.5 DPD should dedicate a resource to be responsible for the Citywide DDACTS implementation.		
Agree or Disagree with Recommendation	**Target date to complete implementation activities (Generally expected within 60 to 90 days)**	**Name and phone number of specific point of contact for implementation**
Disagree	NA	NA

Narrative for Recommendation 1.5
The DPD command staff will not implement the DDACTS model as recommended by the Auditor's Office. DPD will continue to improve our methods and continue to borrow from the DDACTS guidelines if and when they are useful in achieving DPD goals.

RECOMMENDATION 1.6 DPD should improve and document training, reporting, and information sharing efforts to promote knowledge and acceptance of DPD's DDACTS model for personnel executing DDACTS.		
Agree or Disagree with Recommendation	**Target date to complete implementation activities (Generally expected within 60 to 90 days)**	**Name and phone number of specific point of contact for implementation**
Disagree	NA	NA

Narrative for Recommendation 1.6
The DPD command staff will not implement the DDACTS model as recommended by the Auditor's Office. DPD will continue to improve our methods and continue to borrow from the DDACTS guidelines if and when they are useful in achieving DPD goals. However, DPD will enhance the training module in the academy Crime Analysis class to include more detailed information about DDACTS. In addition, when appropriate to fulfill district initiatives, additional training will be available to corporals who provide training and guidance to patrol officers.

RECOMMENDATION 1.7
DPD should monitor, evaluate, and adjust its DDACTS model. Specifically, the frequency of DDACTS monitoring or evaluation and the roles and responsibilities of the DAU and district operational personnel in these activities should be defined.

Agree or Disagree with Recommendation	Target date to complete implementation activities (Generally expected within 60 to 90 days)	Name and phone number of specific point of contact for implementation
Disagree	Provided by auditee	Provided by auditee

Narrative for Recommendation 1.7
The DPD command staff will not implement the DDACTS model as recommended by the Auditor's Office. DPD will continue to improve our methods and continue to borrow from the DDACTS guidelines if and when they are useful in achieving DPD goals.

RECOMMENDATION 1.8
To improve its process for monitoring and evaluating the effectiveness of DDACTS, the DAU should use additional commonly accepted performance measures and conduct additional analyses for determining the impact of policing efforts.

Agree or Disagree with Recommendation	Target date to complete implementation activities (Generally expected within 60 to 90 days)	Name and phone number of specific point of contact for implementation
Disagree	NA	NA

Narrative for Recommendation 1.8
The DPD command staff will not implement the DDACTS model as recommended by the Auditor's Office. DPD will continue to improve our methods and continue to borrow from the DDACTS guidelines if and when they are useful in achieving DPD goals.

RECOMMENDATION 1.9
DPD should design and test the implementation of internal controls surrounding the data reliability for any data used for its DDACTS model and document that process.

Agree or Disagree with Recommendation	Target date to complete implementation activities (Generally expected within 60 to 90 days)	Name and phone number of specific point of contact for implementation
Disagree	NA	NA

Narrative for Recommendation 1.9
The DPD command staff will not implement the DDACTS model as recommended by the Auditor's Office. DPD will continue to improve our methods and continue to borrow from the DDACTS guidelines if and when they are useful in achieving DPD goals.

Please contact Deputy Chief David Quinones at 720-913-6527 with any questions.

Sincerely,

Stephanie O'Malley
Executive Director
Department of Public Safety

cc: Valerie Walling, Deputy Auditor, CPA,CMC
Katja Freeman, Audit Manager, MA, MELP
Chief Robert White, Denver Police Department
Deputy Chief David Quinones, Denver Police Department
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