

# DESIGNING AN EFFECTIVE LAW ENFORCEMENT DATA DASHBOARD

Developing a Concept of Operations Document

Michael Jacobson

Mark Perbix

Karen Lissy



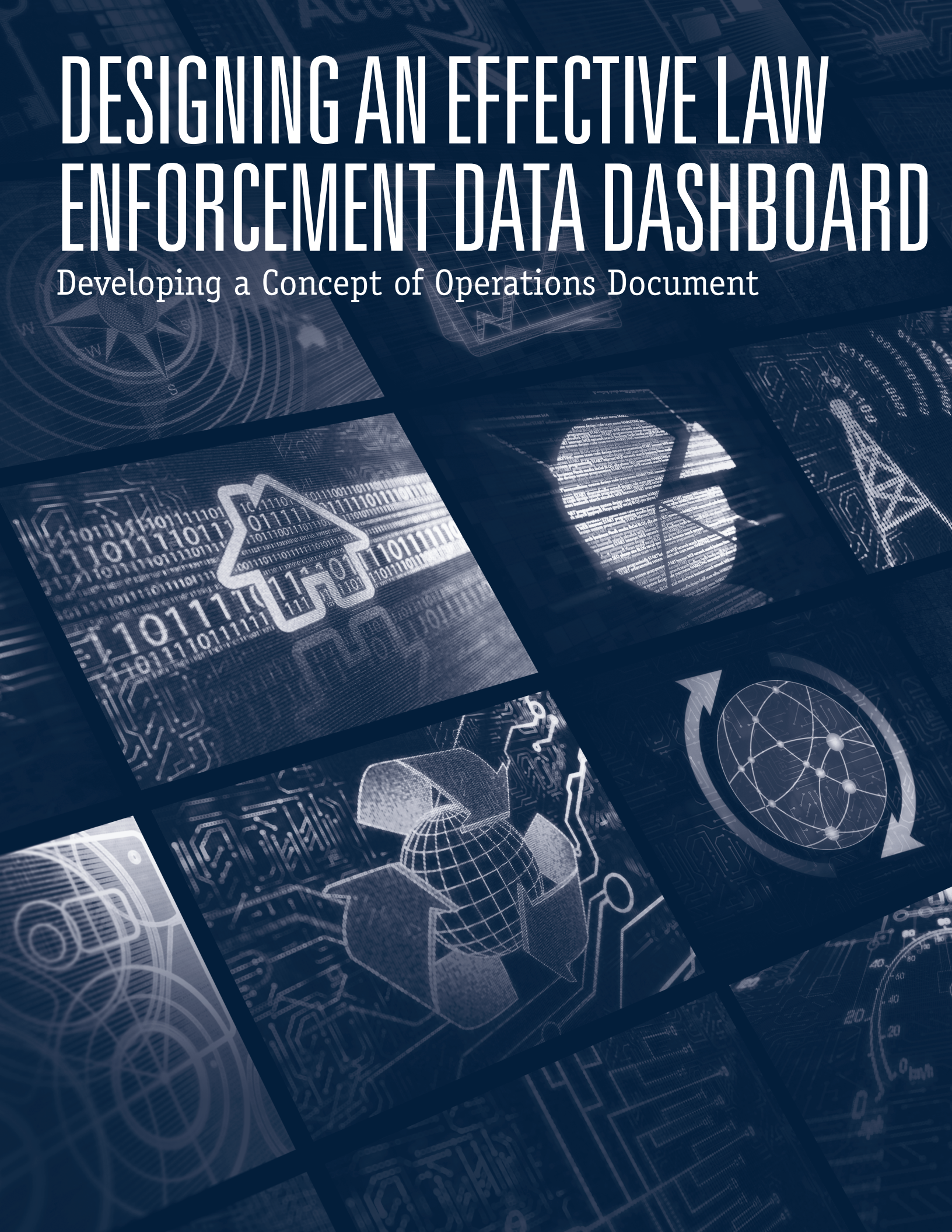
**COPS**


Community Oriented Policing Services  
U.S. Department of Justice



# DESIGNING AN EFFECTIVE LAW ENFORCEMENT DATA DASHBOARD

Developing a Concept of Operations Document





This project was supported, in whole or in part, by cooperative agreement 2019-CK-WX-K018 awarded to SEARCH, Group, Inc. by the U.S. Department of Justice, Office of Community Oriented Policing Services. The opinions contained herein are those of the author(s) or contributor(s) and do not necessarily represent the official position or policies of the U.S. Department of Justice. References to specific individuals, agencies, companies, products, or services should not be considered an endorsement by the author(s), the contributor(s), or the U.S. Department of Justice. Rather, the references are illustrations to supplement discussion of the issues.

The internet references cited in this publication were valid as of the date of publication. Given that URLs and websites are in constant flux, neither the author(s), the contributor(s), nor the COPS Office can vouch for their current validity.

This resource was developed under a federal award and may be subject to copyright. The U.S. Department of Justice reserves a royalty-free, nonexclusive, and irrevocable license to reproduce, publish, or otherwise use and to authorize others to use this resource for Federal Government purposes. This resource may be freely distributed and used for noncommercial and educational purposes only.

Recommended citation:

Jacobson, Michael, Mark Perbix, and Karen Lissy. 2023. *Developing a Concept of Operations Document. Designing an Effective Law Enforcement Data Dashboard*. Washington, DC: Office of Community Oriented Policing Services.

Published 2023

# Contents

Acknowledgments . . . . .	v
Letter from the Director of the COPS Office . . . . .	vi
Letter from the Executive Director of PERF. . . . .	vii
Letter from the Executive Director of SEARCH . . . . .	viii
About This Product Suite. . . . .	ix
Introduction . . . . .	1
Purpose of this publication . . . . .	1
What is a Concept of Operations document? . . . . .	2
1. What is a Law Enforcement Dashboard? . . . . .	3
2. The Process of Developing a ConOps . . . . .	11
3. Who Should Participate in Developing a ConOps?. . . . .	14
4. Developing a ConOps for a Dashboard System . . . . .	16
Format of dashboard ConOps. . . . .	16
Contents of a typical dashboard ConOps. . . . .	18
5. Example ConOps for a New Law Enforcement Dashboard. . . . .	22
1.0 Introduction . . . . .	22
2.0 Goals, Objectives, and Rationale for the New System . . . . .	30
3.0 Work Processes to Be Automated/Supported . . . . .	31

4.0 Functional Requirements . . . . .	33
5.0 Non-Functional Requirements. . . . .	33
6.0 User Classes and Modes of Operation . . . . .	36
7.0 Impact Considerations . . . . .	39
Appendix A. Concept of Operations Template. . . . .	43
Appendix B. Law Enforcement Data Dashboards Project Advisory Committee Members . . . .	48
Resources . . . . .	50
About SEARCH . . . . .	52
About PERF. . . . .	53
About the COPS Office . . . . .	54

# Acknowledgments

This document was prepared by SEARCH, Group Inc., in collaboration with the Police Executive Research Forum (PERF) and the U.S. Department of Justice, Office of Community Oriented Policing Services (COPS Office). The project team included SEARCH staff Michael Jacobson, Information Sharing Specialist; Karen Lissy, Justice Information Services Specialist; and Mark Perbix, Programs Director; PERF staff Dave McClure, Senior Principal; and COPS Office staff George Fachner, Program Manager.

# Letter from the Director of the COPS Office

Colleagues:

Policing, like so many other fields, is increasingly data-driven. Timely, accurate data, in useable formats, are necessary to law enforcement agencies seeking effective answers to policing challenges.

Data are in high demand outside the agency as well. The public wants to know how much crime is occurring in their neighborhoods, what agencies are doing to address it, the budgetary costs of these efforts, and how well they are succeeding—and law enforcement agencies want to provide these data, to create greater transparency and foster community trust. One method for making data more accessible is through a data dashboard.

Data dashboards, when implemented well, can provide much of this information, at a glance, to the people who require it. An effective, well-designed dashboard can enhance internal operations and fight informational silos while also informing the public about what is happening in their communities.

This series of three publications, *Getting It Right and Why it Matters*, *Developing a Concept of Operations Document*, and *Functional and Technical Requirements*, draws together best practices for conceptualizing, designing, and implementing a data dashboard, both for law enforcement agencies developing their own product and those using an external vendor.

The COPS Office's resources and technical assistance consistently support law enforcement agencies in developing a "what works" approach to working collectively with their communities to solve modern policing challenges. Data dashboards can be a powerful tool for increasing public transparency. We hope these three publications will help agencies use their own data to improve performance metrics, agency response, and community trust, and to enhance safety in their communities.

Sincerely,



Hugh T. Clements, Jr.

Director

Office of Community Oriented Policing Services



# Letter from the Executive Director of PERF

Dear colleagues,

Police departments have more data than ever before, and a growing number have created dashboards to help them make better, data-driven decisions. But there are many possible approaches to designing a data dashboard, and a number of pitfalls to avoid. A dashboard that is ineffective—one that's easy for end users to misread or misinterpret, for example—is worse than none at all.

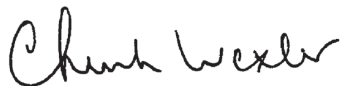
The most effective dashboards often seem simple in their design and presentation, but a lot of hard work goes into making something that is easy for users to operate. These three reports are designed to help departments design data dashboards that are useful and meet a department's unique needs. *Getting it Right* gives examples from the field about following an organized approach to developing data dashboards. *Developing a Concept of Operations* focuses on creating a shared understanding across users of the capabilities a data dashboard should provide. *Technical Functional Requirements* looks at the technical side of developing and implementing data dashboards.

I would like to thank the staff of the National Consortium for Justice Information and Statistics (also called SEARCH) and the U.S. Department of Justice's Office of Community Oriented Policing Services (COPS Office) for their collaborative efforts on the three reports. I would also like to thank the project advisory board (see appendix B) for their expertise, which assisted in molding and completing this work.

Finally, I would like to thank PERF staff members Dave McClure, Senior Principal and Kevin Morison, Chief Program Officer, for their work on this project.

I hope you will find these reports useful.

Sincerely,



Chuck Wexler

Executive Director

Police Executive Research Forum

# Letter from the Executive Director of SEARCH

Dear colleagues,

Law enforcement agencies are implementing data dashboards to communicate valuable information, support data-driven decision-making, and provide information to the public.

SEARCH is pleased to provide the law enforcement and public safety communities with three educational documents on how to develop effective data dashboards: (1) *Getting It Right and Why it Matters*, (2) *Developing a Concept of Operations Document*, and (3) *Functional and Technical Requirements*.

The effective use of data is more important than ever for promoting transparency and accountability, and data dashboards are often the best way to do this. They provide timely information “at a glance” about important topics of interest to the many different audiences interested in law enforcement and public safety activities, both internal and external.

The goal of these three guides is to cover the lifecycle of the data dashboard development process from inception—providing the justification and benefits of developing a dashboard—through design and requirements. Using these documents as guides, any agency should be able to develop their own data dashboards or prepare an effective Request for Proposal (RFP) to acquire a dashboard product from a vendor or service provider.

Sincerely,



David J. Roberts  
SEARCH Executive Director

# About This Product Suite

The **Law Enforcement Data Dashboard Project** is a collaboration between SEARCH Group, Inc. (SEARCH), the Police Executive Research Forum (PERF), and the Office of Community Oriented Policing Services (COPS Office) to produce user-friendly guidance and tools to help law enforcement agencies successfully plan, design, implement, and sustain effective information dashboards within their ecosystems.

This report is part 2 of a three-product suite, *Designing an Effective Law Enforcement Dashboard*, which is intended to educate law enforcement and public safety executives, thought leaders, dashboard designers, project managers, and other integral stakeholders in the development process from project inception to technical design and development. Each product is based on extensive research and consultation with law enforcement leaders and subject matter experts in law enforcement, data science, information systems, project management, and technology innovation. Throughout each publication, the reader will find helpful tips with examples of real-world operational dashboards that are helping law enforcement agencies manage, analyze, and display actionable information in a user-friendly interface.

Three themes cut across all three products:

1. **Purpose.** Think methodically about the specific issue you intend to address by developing a dashboard.
2. **Collaboration.** Engage with key stakeholders, data owners, and end users throughout the design and development process to ensure the purpose envisioned for the dashboard matches the reality of what is possible.
3. **Communication.** Dashboards tell a story about high-value information to an end user. The organization or unit behind the dashboard is communicating its values in what it measures, tracks, and reports through its dashboard.

Beyond these three themes, each product focuses on a different aspect of dashboard creation and a different audience:

- *Getting it Right and Why it Matters: An Introduction*

**Audience:** Law enforcement executives, thought leaders/influencers, end users, community members, all stakeholders

**Purpose:** This guide serves as a primer on the promise and perils of dashboard inception, design, and development. It offers key insights from law enforcement leaders, designers, and technology innovators with extensive knowledge and expertise on the topic. Individuals who want to learn about what a dashboard is, how it can be leveraged as a powerful tool and resource in law enforcement, and pitfalls to avoid should read this guide.

- *Developing a Concept of Operations*

**Audience:** Project managers, agency stakeholders, end users, IT staff

**Purpose:** This guide provides a roadmap for developing a concept of operations (ConOps) document for a law enforcement dashboard. The purpose of a ConOps is to ensure that all stakeholders share a common vision and understanding of the capabilities a data dashboard can and should provide. This document includes helpful checklists, templates, and a complete example dashboard that readers can modify to suit their own purposes. Individuals who are charged with designing and implementing a law enforcement dashboard or writing a ConOps should read this guide. Individuals with approval authority or otherwise significant stake in the end product should also read this guide.

- *Developing Technical and Functional Requirements*

**Audience:** Project managers, IT staff

**Purpose:** This guide provides a roadmap for developing the technical and functional capabilities of a law enforcement dashboard system. It can be used to procure, develop, and implement a dashboard solution. Like *Developing a Concept of Operations*, it includes helpful checklists, templates, and instruction that readers should adapt to suit their agency-specific needs.

# Introduction

## Purpose of this publication

Law enforcement agencies have become data-driven to better understand the problems they face and improve their ability to respond effectively. Their data comes from many different sources and is analyzed by many different applications, which may present results as reports, tables, and spreadsheets. Crime analysts and other staff then aggregate this data further, generating new reports and displays. Often, to retrieve and use all of these data requires separate access methods and rules for each source, making it difficult for agency staff and stakeholders to combine data to understand the whole picture of what is happening within an agency.

An increasingly popular way for agencies to aggregate and visualize data from multiple sources is to use a data dashboard: a tool that displays information on several key performance metrics at a glance.

Dashboards allow the user to find answers to questions of interest by monitoring key performance indicators (KPI) through graphical presentations and visualizations. They can provide a view of KPIs relevant to a specific objective or set of objectives. Dashboards use data from regularly updated data sets and often combine data from multiple sources. They can be used to improve efficiency by providing real-time access to information rather than relying on static, periodically produced reports.

The purpose of this publication is to describe how to develop a Concept of Operations document, also called a ConOps, to educate and advocate for the development of a dashboard platform that can be used in the law enforcement environment. It includes the following sections:

1. An overview of law enforcement dashboards and the high-level steps needed to develop and implement dashboards in a law enforcement agency
2. Guidance on developing a ConOps for a law enforcement dashboard system, including a description of the topics that should be included in a ConOps
3. An example ConOps document, which tailors a standard industry format for law enforcement dashboard use

## What is a Concept of Operations document?

The purpose of a Concept of Operations document (ConOps) is to establish a clear vision and understanding of a problem and its proposed solution, as well as the solution's capabilities, limitations, and potential costs. A ConOps should capture and document the results of the conceptual analysis process and inform decision-makers about the advantages and disadvantages of the proposed solution compared to their existing capabilities.

Developing a ConOps is a common way to communicate to leadership the business case for acquiring a new system, such as a dashboard. A ConOps can help ensure a common understanding of problems and their solutions, garner the support of critical sponsors, secure financial support, and establish a governance structure.

An effective ConOps achieves the following goals:

- Describes the current state of the process or system currently in use and identifies areas for improvement
- Outlines the characteristics of the proposed system (from the users' perspectives) and the operational environment in which it needs to function; it also usually details high-level user requirements and expected outcomes
- Identifies the various classes of users and their needs
- Supports the decision-making process that determines whether a new system should be developed

In addition, the ConOps serves as the basis for the more detailed requirements documents needed to acquire and implement the system.

The remainder of this guide provides law enforcement agencies with a better understanding of how to effectively present data using a dashboard and how to write a ConOps to support implementing such a dashboard.

# 1. What is a Law Enforcement Dashboard?

Data dashboards are used to track, analyze, and display key performance indicators, metrics, and measures. They are commonly defined by their functions, which may include providing at-a-glance visualizations and easy-to-understand graphics through which users can monitor trends, analyze data, and measure key performance indicators (KPI).

For the purpose of this guide, a dashboard is a data analysis tool that displays select performance measures that are important to a given audience in a manner that is easy to use and understand—typically as graphical visualizations (e.g., charts and graphs). These visualizations are used to simplify complex data and more easily convey information to inform decisions.

Common Dashboard Attributes:

- At a Glance
- Insights
- Analysis
- Measures
- Graphic Visualizations
- Easy to Understand

By compiling and presenting data and data analyses focused on specific performance measures, dashboards can help decision-makers align strategies with agency objectives; quickly identify data trends, outliers, or anomalies; and make comparisons.

Law enforcement agencies have adopted dashboards to visually present high-value information to a given audience. Dashboards can combine data from multiple data sources into one KPI—for example, calculating the crime rate per capita, which requires population data as well as reporting on the number of crimes.

*“Our dashboard is a snapshot of the department for staff to access. It includes information such as staffing, both current and projected. It includes crime rates, calls for service comparisons, current national rankings, our mission statement, hiring trends and a variety of other stats.”*

– Captain Travis DiGiulio, Investigations, Stockton (California) Police Department

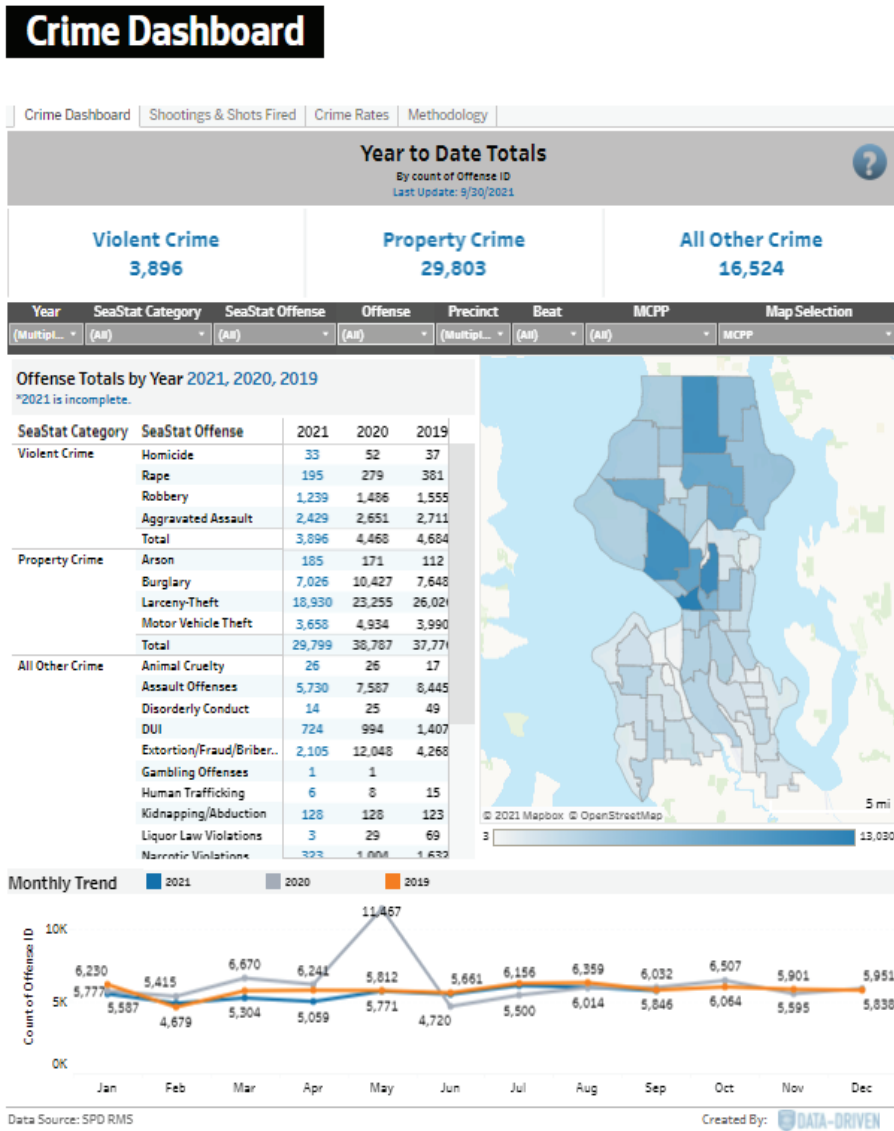
Law enforcement dashboards focus on crime trends, characteristics of incidents, response times, officer-involved shootings, officer complaints, clearance rates, and other focus areas where an agency collects or has access to data. For example, command staff can use a daily activity dashboard to monitor public safety incidents using data from computer-aided dispatch (CAD) or records management systems (RMS). Dashboards can also focus on internal administrative metrics such as staffing levels, hiring trends, and staff performance (e.g., officer-involved shootings and complaints).

Dashboards can be public-facing or internal. A dashboard intended for public view can be used to share information on many topics of interest, including overall crime rate trends, locations of crimes within the jurisdiction, and breakdowns of crime by type and severity. Internal dashboards are useful tools for agency personnel to identify and assess progress on KPIs, quickly identify anomalies, answer frequently asked questions, and provide insights to decision-makers to assess agency performance and help drive improvements.

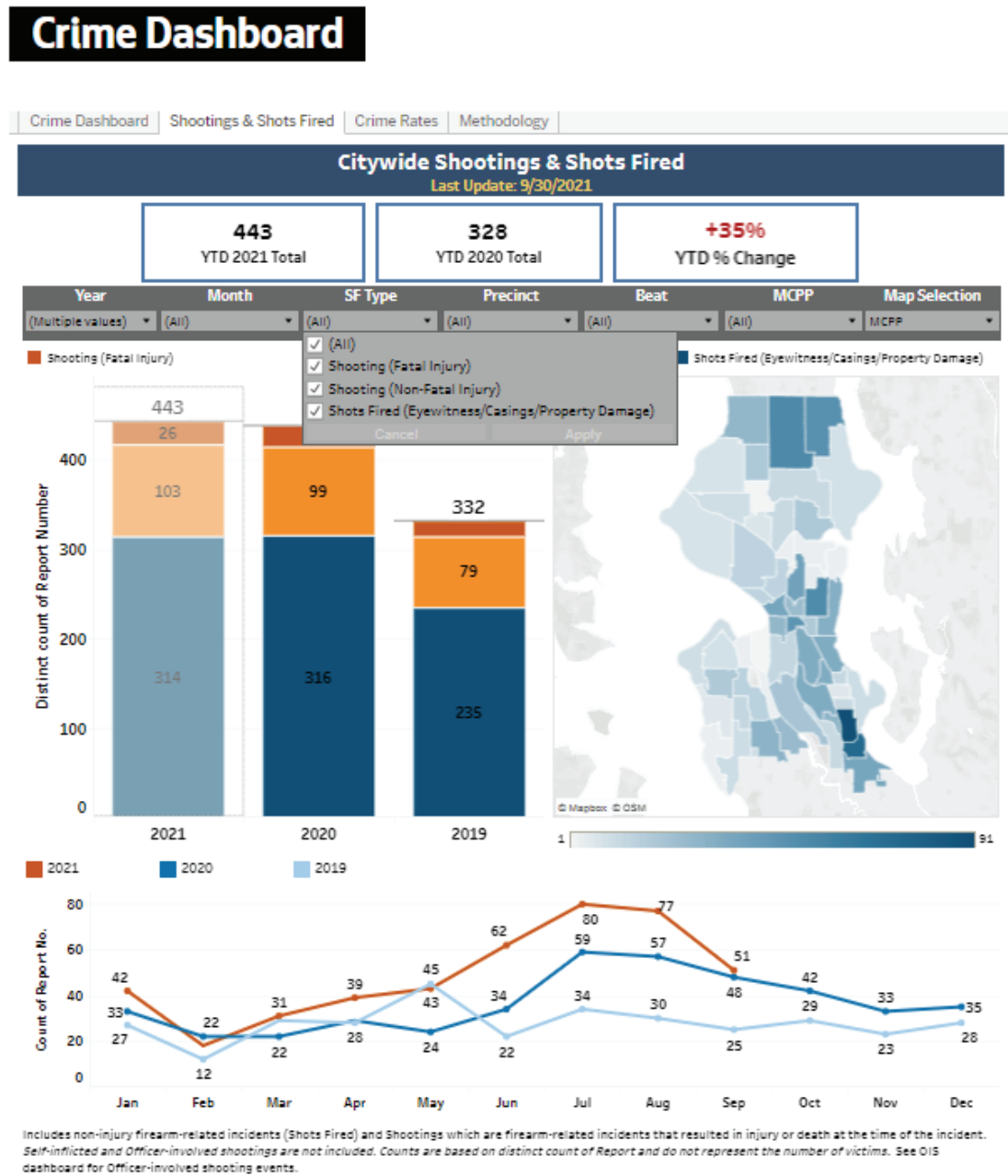
In law enforcement agencies that have implemented CompStat programs, the RMS often includes dashboard capabilities. CompStat dashboards present data trends and patterns to command staff and other users in easy-to-understand graphics, such as those shown in figures 1–3 from the Seattle Police Department Crime Dashboards. Dashboards based on CompStat data can be designed to allow filtering and drilldowns by time, offense, and precinct and to provide historical and predictive trends.



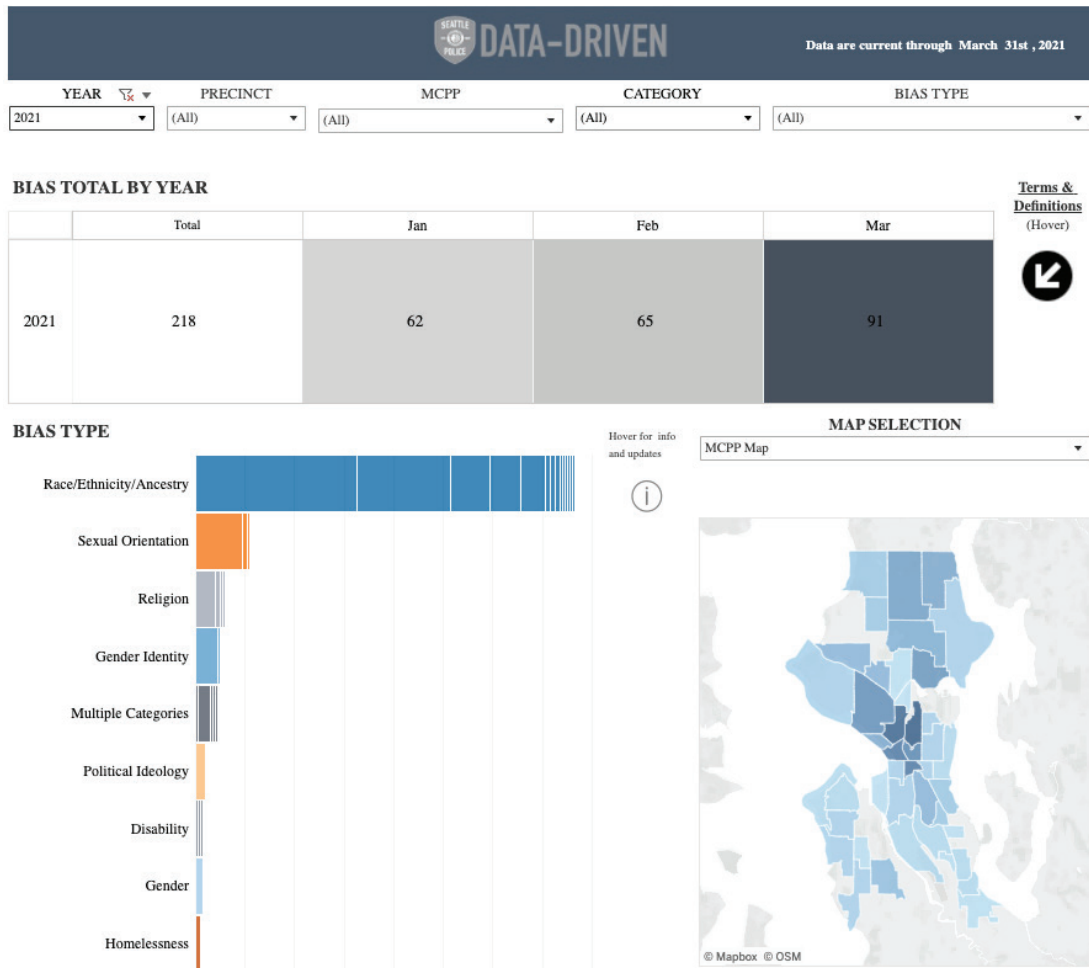
Figure 1. Seattle (Washington) Police Department CompStat dashboard: Total crime by year



**Figure 2. Seattle (Washington) Police Department CompStat dashboard: Citywide shootings and shots fired**



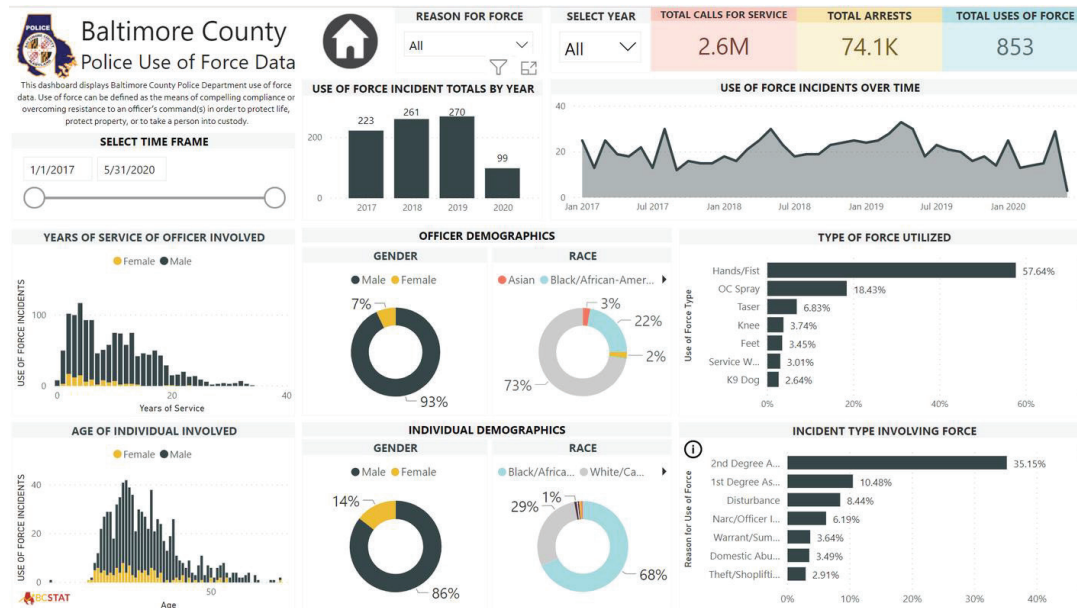
**Figure 3. Seattle (Washington) Police Department dashboard: Hate crimes by year**



Research of existing law enforcement dashboards conducted by the Police Executive Research Forum (PERF) shows that dashboards vary significantly in their content and purpose and present a wide range of data in a variety of formats.

Figure 4 on page 8 depicts how Baltimore County, Maryland, uses a dashboard to aggregate and analyze its use of force data.

**Figure 4. Baltimore County (Maryland) Use of Force dashboard**



This example incorporates several different kinds of analytic visualizations into a single dashboard. Results are displayed in multiple formats for ease of cross-category comparison:

- *Use of Force Incident Totals by Year* provides an aggregated count of the total use of force incidents for four years. In addition to the counts, it presents the data in a bar chart to make each year's total use of force incidents easier to compare across years.
- *Use of Force Incidents Over Time* presents a trend line of use of force incidents over time that can be scaled using the *Select Time Frame* slider on the upper left.
- *Type of Force Utilized* and *Incident Type Involving Force* both show the factors involved in the use of force incidents broken out into categories of interest. The bar charts allow for visual comparison of the relative proportions of these categories, although counts and percentages are used as well.

Figure 5. California Department of Justice dashboard: Traffic stop locations

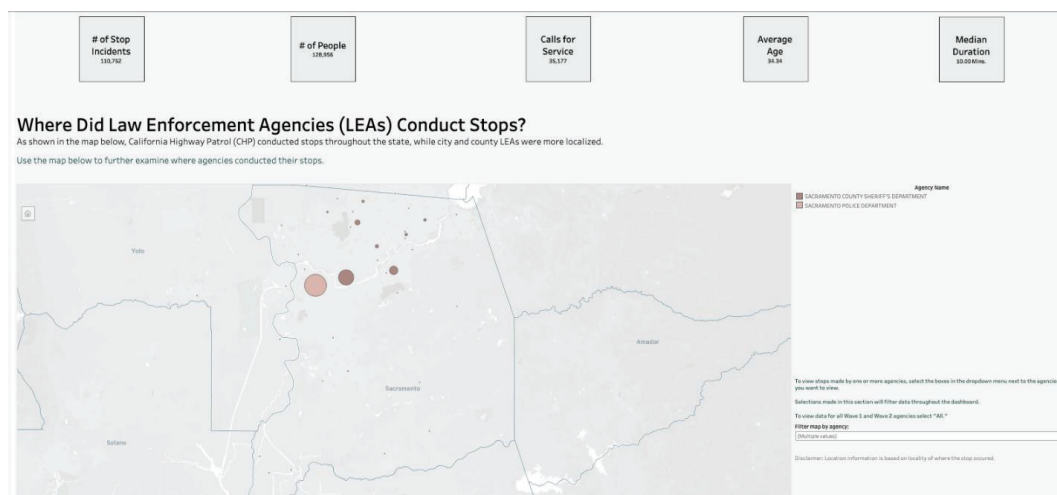


The California Department of Justice dashboard shown in figure 5 uses a more complex analytic visualization to communicate the relative frequency of traffic stops in different areas across the state.

This dashboard also allows the user to filter by agency providing a more localized view (figure 6 on page 10).

The size of the circles represents the relative number of stops—larger circles mean more stops—while their position on the map shows stop locations and their color identifies the agency performing the stop. This visualization effectively conveys three different types of information on one topic in a single visualization.

**Figure 6. California Department of Justice dashboard: Traffic stop locations filtered by agency**



Figures 4, 5, and 6 illustrate a variety of performance measures, display options, and ways of conveying complex information to the user. When designing a dashboard, care should be taken to identify measures that address the metric of interest and visualization formats that most effectively convey this information to the intended audience. The most effective dashboards require little explanation: The data they present speak for themselves without a need for detailed descriptions.

*“To be honest, we don’t [do training for our data dashboards]. Most of the dashboards are built in such a way that what’s provided answers the questions they generally have. The rest of the dashboards are built in such a way that I can tailor their output to answer the questions they generally have or have asked in the past.”*

– Crime Analyst Kent Christen, Investigations, Cedar Rapids (Iowa) Police Department

A good dashboard is deceptively simple to use, but that simplicity reflects a significant amount of forethought and analysis in its development. Dashboard development requires the investment of personnel and financial resources. Executive leadership in the agency—and often city, county, or state decision-makers—need to understand and be convinced of the business case to support its development. The development of a ConOps can fulfill this need.

## 2. The Process of Developing a ConOps

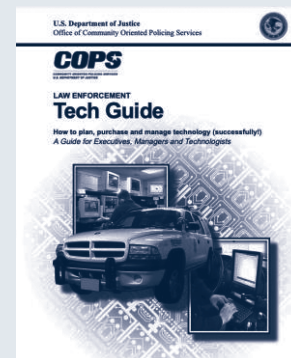
The primary focus of this document is to assist and guide law enforcement agencies in how to develop a ConOps for a law enforcement dashboard. To effectively write a ConOps, stakeholders need to understand both the process of developing a dashboard and the process of developing the ConOps itself. This section summarizes project management best practices for developing a dashboard.

As with all complex IT projects, the successful implementation of a dashboard requires planning and a sound development methodology: A law enforcement agency should follow the same basic set of steps used to design and implement any technology project.

### Guidance on Project Management for Law Enforcement Technology Development

Guidance on how to manage technology projects abounds. The COPS Office has published specific guidance for law enforcement technology projects:

- Harris K.J., and W. H. Romesburg. 2002. *Law Enforcement Tech Guide: How to Plan, Purchase, and Manage Technology (Successfully!): A Guide for Executives, Managers, and Technologists*. Washington, DC: COPS Office. <https://www.search.org/files/pdf/TECHGUIDE.pdf>.



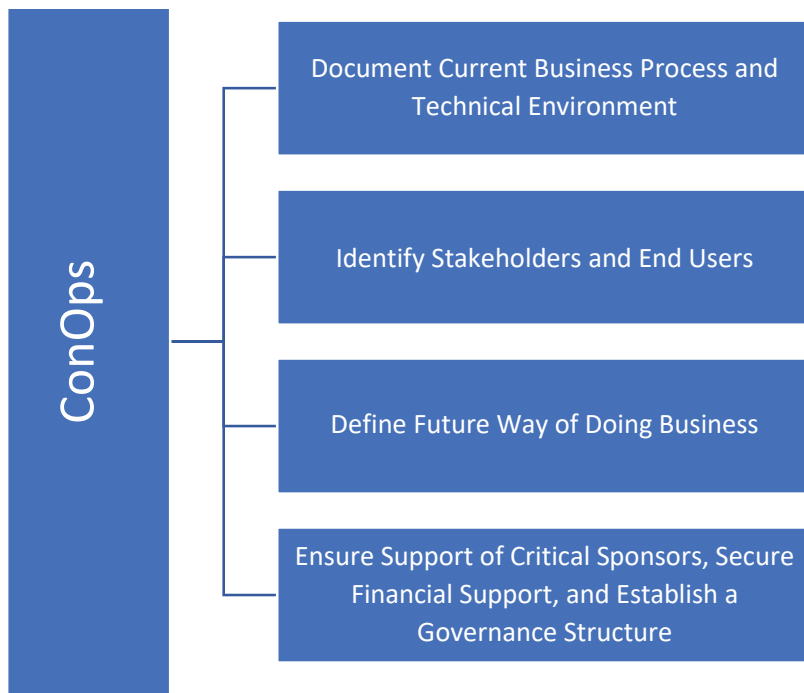
Law enforcement agencies across the country use this project management guide to implement information technology solutions. It contains step-by-step instructions in the planning, acquisition, implementation, and integration processes that focus on supporting public safety and community policing objectives. This guide is designed to help agencies successfully utilize technology to better serve their communities.

Vendors of project management software, such as the following, are another source of guidance:

- Kissflow, “The Basics of Project Management,” <https://kissflow.com/project/project-management-basics/>
- Teamwork.com, “How to create a project management plan that actually works (Template included),” <https://www.teamwork.com/project-management-guide/project-management-plan/>
- PMI, *A Guide to the Project Management Body of Knowledge*, <https://www.pmi.org/pmbok-guide-standards/foundational/PMBOK>

The project planning process sets goals and objectives, establishes timelines, allocates resources, and inventories and evaluates the data the department is collecting.

**Figure 7. Project management processes that contribute to the ConOps**



Four key project management activities contribute to the development of the ConOps:

1. **Document current business process and technical environment.** The first activity is to capture how the department currently analyzes its data, especially routine analyses, and how it tracks trends and other measures of interest.
2. **Identify stakeholders and end users.** Identify all expected end users and stakeholders who may use the dashboard. End users may include senior leadership, supervisors, patrol officers, analysts, technology personnel, as well as policy makers, the media, and the public.
3. **Design future ways of doing business.** Start the conceptual analysis process by querying your stakeholders and end users to solicit suggestions for improvement. Use this information to overcome the problems or shortfalls identified in the current business process.
4. **Ensure support of critical sponsors, secure financial support, and establish a governance structure.** Obtain support and backing from leadership. Identify financial support and establish a governance structure, which is the foundation of any technology project.



The first three activities are critical for gathering information to include in the ConOps. The fourth activity is a crucial aspect of the concept phase of a project; the support and input of leadership and sponsors is necessary for the development of the ConOps. The example ConOps at the end of this publication illustrates how the information from these activities can be applied to the development of the ConOps.

Because the ConOps is focused on defining the dashboard and how it will be implemented, the specific requirements of the dashboard visualizations should always be included at the beginning of the planning process. Defining these requirements will involve deciding on the initial measures and metrics that the dashboard will display, designing the visualizations to be meaningful for the intended audience, and understanding the data that will feed into those metrics and where to find them. Because the dashboard can use data from multiple datasets, it is important to understand where and how the data are collected, stored, and used, so all of the information can be evaluated for inclusion in the dashboard.

These are only some of the necessary activities in the project planning process. Other project management activities that are outside the scope of the ConOps include establishing a project team, defining the procurement process, conducting testing and training on the early versions of the dashboard, and implementing the solution. It is also good at this stage to establish a process for ongoing support and maintenance and for continually improving and updating the dashboard.

### 3. Who Should Participate in Developing a ConOps?

*“For the most part anyone in the agency can have access to any basic information or numbers about calls for service, crimes, and cases under investigation. . . . [Before dashboards,] information silos [were] a major hindrance at times, with no processes in place to overcome them.”*

– Anonymous Operational and Technical Respondent from a Law Enforcement Agency

A ConOps should be the product of stakeholder input describing current problems and should present solutions to these problems. All potential users, including agency leaders, supervisors, officers, crime analysts, the media, and the public, can contribute to the overall vision of the dashboard and help to justify its need to agency decision-makers. These users should define the high-level use cases and requirements that will inform the effort of acquiring or designing the system. Technology staff or vendors who will develop and support the dashboard should contribute their understanding of user needs and how the solution will fulfill them. It is critical that a ConOps include input from those stakeholders who will develop, maintain, or support the dashboard system to ensure that it accurately reflects the requirements and expectations of all parties. Potential internal and external stakeholders include the following:

- Senior leadership
- City or county leaders
- Command staff
- Public representatives
- Crime analysts
- Media representatives
- Agency staff

- Information technology staff
- Public information officers
- Researchers



# 4. Developing a ConOps for a Dashboard System

The remainder of this publication lays out templates for ConOps development that an agency can adapt to its own needs and resources. This chapter provides an outline for a typical ConOps and describes what information should appear in each section.<sup>1</sup> Chapter 5 presents a fully fleshed-out example of a completed ConOps.

## Format of dashboard ConOps

A typical ConOps for a data dashboard project might contain the following sections:

- 1.0. INTRODUCTION
  - ▲ 1.1. Project Description
    - 1.1.1. Background
    - 1.1.2. Project Authorization
  - ▲ 1.2. Overview of the Envisioned System
    - 1.2.1. Overview
    - 1.2.2. System Scope
  - ▲ 1.3. Document References (if needed)
  - ▲ 1.4. Glossary (if needed)
- 2.0. GOALS, OBJECTIVES, AND RATIONALE FOR THE NEW SYSTEM
  - ▲ 2.1. Goals and Objectives of the Dashboard System
  - ▲ 2.2. Rationale for the Dashboard System

---

1. This outline and instructions are adapted from *Systems Development Life Cycle Guidance Document*, Appendix C-9 (Washington, DC: U.S. Department of Justice, 2003), <https://www.justice.gov/archive/jmd/irm/lifecycle/appendixc9.htm>.

- 3.0. WORK PROCESSES TO BE AUTOMATED/SUPPORTED
- 4.0. FUNCTIONAL REQUIREMENTS
  - ▲ 4.1. Required Features
  - ▲ 4.2. Additional Features (if needed)
- 5.0. NON-FUNCTIONAL REQUIREMENTS
  - ▲ 5.1. Required Capabilities
  - ▲ 5.2. Deployment and Support Requirements
  - ▲ 5.3. Configuration and Implementation
  - ▲ 5.4. System Environment
- 6.0. USER CLASSES AND MODES OF OPERATION
  - ▲ 6.1. User Roles
  - ▲ 6.2. User Roles Mapped to Functional Features
  - ▲ 6.3. Sample Operational Scenarios
- 7.0. IMPACT CONSIDERATIONS
  - ▲ 7.1. Operational and Organizational Considerations
  - ▲ 7.2. Potential Benefits and Risks
  - ▲ 7.3. Assumptions and Constraints

## Contents of a typical dashboard ConOps

*The purpose of the ConOps is to remove opportunities for people to make mistaken assumptions. When filling in these details, be specific enough for someone else to be able to recognize whether or not they agree with the vision and approach.*

### 1.0 Introduction

**1.1 Project Description.** Provide an overview of the project and its expected outcomes.

**1.1.1 Background.** Summarize the conditions that created the need for the new dashboard system. Clearly state the problem that requires the agency to implement a dashboard system. Then, describe the proposed solution and expected outcomes.

**1.1.2 Authorization.** State under whom or under what authority the ConOps is being developed.

### 1.2 Overview of the Envisioned System

**1.2.1 Overview.** Provide an overview of the envisioned dashboard system. Include a brief discussion of its capabilities, functions, and features. There will be an opportunity for a more detailed discussion of the capabilities, functions, and features of the dashboard in section 4.0 of the ConOps; this section provides merely a high-level overview of the proposed project.

**1.2.2 System Scope.** Provide an estimate of the size and complexity of the solution. The scope statement should define key deliverables that focus on meeting the goals and objectives.

**1.3 Document References** (if needed). List the sources used or referenced in the ConOps. Include meeting summaries, white papers, analyses, and any other documentation.

**1.4 Glossary** (if needed). Provide a glossary of terms used in the document. This may also be provided as an appendix.

### 2.0 Goals, Objectives, and Rationale for the New System

**2.1 Goals and Objectives of the Dashboard System.** Define the overall goals and objectives of the new dashboard system.

**2.2 Rationale for the Dashboard System.** Describe why the dashboard system is needed. State the justification for the new dashboard system. If the need is to improve an existing dashboard system, describe why the existing system must be changed.

### 3.0 Work Processes to Be Automated/Supported:

This section generally describes each major process and the functions or steps performed during each work process. For a dashboard project this section can be used to provide use cases for each user group and how each dashboard will be used and improve operations.

*Section 4 should include the features that the users find most useful and most desirable.*

### 4.0 Functional Requirements

**4.1 Required Features.** Briefly describe requirements for features, capabilities, and functions of the dashboard system at a high level.

**4.2 Additional/Optional Features** (if needed). Describe any additional or optional features that would enhance the utility or usability of the dashboard system.

### 5.0 Non-Functional Requirements

Non-functional requirements are those requirements that are part of the infrastructure and management of a data system, including provisions for hosting the dashboard, data security and privacy requirements, disaster recovery, continuity of operations, etc. Describe these factors in this section. You need not address detailed server configuration or other infrastructure information.

**5.1 Required Capabilities.** Address the following items in business terms rather than as detailed specifications: performance, accessibility, portability, security, and system survivability.

**5.2 Deployment and Support Requirements.** Describe deployment considerations, such as acquisition of business data to support the dashboards (including data cleansing and loading), as well as requirements to maintain and support the system, such as service-level expectations.<sup>2</sup>

**5.3 Configuration and Implementation.** Describe the operational policies and constraints that affect the proposed new dashboard system.

**5.4 System Environment.** Describe the environment in which the dashboard system will be hosted and operate.

---

2. Service-level expectations are the users' expectations that an IT system will be available and operational. They include response times for incidents and requests, prioritization of work, system reliability ("up time") and the outage notification process. These expectations will be incorporated as requirements into a service level agreement.

## 6.0 User Classes and Modes of Operation

**6.1 User Roles.** Identify and describe the major classes/categories of users that will use the dashboard.

**6.2 User Roles Mapped to Functional Features.** Provide an explanation of how the dashboard will look, which dashboards will be accessible by each user role, and the capabilities of each type of role.

**6.3 Sample Operational Scenarios.** Develop sample usage scenarios or use cases for each major user role that show how the user will interact with the dashboard.

*Include brief discussions of the impacts that the project will have as well as the mitigation strategy.*

## 7.0 Impact Considerations

**7.1 Operational and Organizational Considerations.** Describe the impacts to existing operations and organizations. Describe the costs and benefits, including the following:

- the improvements anticipated
- workload/resource impacts
- how the development of the new dashboard system may impact the day-to-day operations
- how long it will take to realize the improvements

**7.2 Potential Benefits and Risks.** Describe the anticipated benefits and any possible drawbacks the proposed system may have for the agency. Discuss other options that were considered, if any. Describe any other considerations, such as project schedule or staffing support, and recommended mitigation strategies. Allocate subsections for each, as necessary.



### 7.3 Assumptions and Constraints.

*Assumptions* are current and future factors that are unknown or conditional and that may influence the success of a project. The following are examples of assumptions for a dashboard system:

- management and funding responsibility
- availability of a hardware/software platform to host the dashboard system
- availability of data and access to that data
- means of ensuring the dashboard information is accurate, consistent, and up to date
- considerations for data preparation to ensure that the data is clean, correctly linked, and relevant
- data providers who are willing to participate and have the resources and capabilities to provide the required data at the required time

*Constraints* are factors outside the control of the project that limit the design alternatives. The following are examples of constraints for a dashboard system:

- policy or legal limitations for information sharing and security
- lack of executive support
- lack of or insufficient funding
- limited staff resources to implement, maintain, and support the dashboard system

# 5. Example ConOps for a New Law Enforcement Dashboard

The next section presents an example of a ConOps for a *new dashboard system* that outlines the business case for the Springfield Police Department, a fictitious mid-size law enforcement agency. The outline in chapter 4 addresses all common components of a ConOps. An agency may not need to address every component when developing its dashboard ConOps.

*Concept of Operations: Internal and External Dashboard System for the Springfield Police Department*

## 1.0 Introduction

The Springfield Police Department (SPD) collects comprehensive data about crimes but lacks the ability to analyze and view this information in a reliable and timely manner to assist in command staff decision-making. The SPD would benefit from creating a dashboard system that would easily display data from different data sources in one easy-to-use application.

This document describes the characteristics of the proposed dashboard system. It begins by identifying gaps in the current system, then describes how the envisioned system fills these gaps and the operational environment needed for the dashboard(s) to function. It addresses the opportunities and challenges in creating a dashboard system at SPD.

## 1.1 Project Description

### 1.1.1 Background

The SPD is charged with responding to and investigating criminal incidents and preventing crime while using its resources efficiently. To achieve these objectives, it is necessary to understand how the department operates and measures its progress towards these objectives. To make these judgements in an informed, evidence-based manner requires data.

The SPD currently collects, analyzes, and reports on its data, but its processes are neither timely nor efficient. The department's data come from multiple data systems: calls for service, incident records, case investigations, fleet management, evidence management, the crime lab, finance, and personnel. Most of the SPD's data are collected in organizational silos, which limits the SPD's

ability to combine data and fully analyze its operations. The SPD currently relies on spreadsheets and written reports to communicate trends to command staff, which can create delays between data production, analysis, and delivery. A dashboard system could consolidate these data sources into a single, interactive tool using up-to-date inputs, which would improve decision-making by providing access to more complete and timely data.

### *1.1.2 Project Authorization*

This project has been authorized by Chief Will Smith and funded using internal administrative funds.

## 1.2 Overview of the Envisioned System

### *1.2.1 Overview*

SPD staff has used the same records management system (RMS) for eight years, and it is outdated. The RMS offers only limited ability to download and query data and does not have the ability to effectively visualize data in ways appropriate for internal agency use or for presentation to the general public. Currently, internal queries are funneled through SPD crime analysts, and public queries are made through the Public Affairs Office, each of which relies on the IT staff to assist in producing these analyses.

While most analyses are made using call for service or incident data, replacing the RMS to gain improved analytic capabilities is a complex and expensive undertaking that is not feasible at this time. Less costly analytical capabilities can be provided by using dashboard technologies that can collect and aggregate data from the RMS as well as other agency operational systems.

- The SPD can realize efficiencies throughout the department by providing better access to consolidated, summarized, and aggregated data. This change would provide command staff with immediate access to information for making strategic decisions and provide other department heads and shift commanders with information for making tactical decisions. Furthermore, it would improve of crime analysts' ability to perform their duties and better support investigations.
- Efficiencies and improved community goodwill could result from giving Springfield community members online access to summarized, anonymized crime data. The general public would benefit by having access to data about crime trends in the community, and the SPD would benefit from receiving fewer requests for crime and safety information. A public-facing dashboard is also a proactive means to address the public's growing concerns about police transparency and accountability.

A new dashboard system can provide graphical representations of current and historical data from the computer-aided dispatch (CAD) system and the RMS and can seamlessly combine these data with relevant data from other sources. The system can use individual visualizations to report incidents, arrests, key trends, and other crime statistics.

### *1.2.2 System Scope*

The proposed dashboard system will provide a centralized tool to monitor, measure, and analyze relevant data from different sources in ways appropriate for the user or intended audience. The dashboard will be interactive, intuitive, and easily understandable, providing visualizations in tables, graphs, and charts.

Developing the proposed system will require the SPD to hire a vendor. The vendor will be tasked with designing and implementing the initial dashboard system and layout and training SPD IT staff to configure and maintain it. The SPD will request that the vendor develop separate sets of dashboards for internal and public use. Each will have different capabilities and functions:

- **Internal dashboards** will allow command staff and other department staff to view crime data in an easy-to-understand form to quickly spot trends without delays created by having to run multiple reports. The dashboard will allow users to see spatial relationships and visualize trends over time. Using maps to plot incidents and related data (automated vehicle location, calls for service) can provide insights into the geographic and temporal distribution of crime.
- **Dashboards for public use** will allow Springfield's residents, the local media, and others to access appropriate data without having to contact the SPD Public Information Office. The public-facing dashboard will provide data related to crime type over time. It can also break down crimes by geographic area (beat or neighborhood) and victim and offender characteristics and can provide context by comparing rates over time. It will include the ability to display data related to calls for service, response times, and simple crime mapping. These dashboards will be interactive and allow users the ability to filter by dates and crime types.

Examples 1–3 illustrate some basic desired features for the proposed dashboard system.<sup>3</sup>

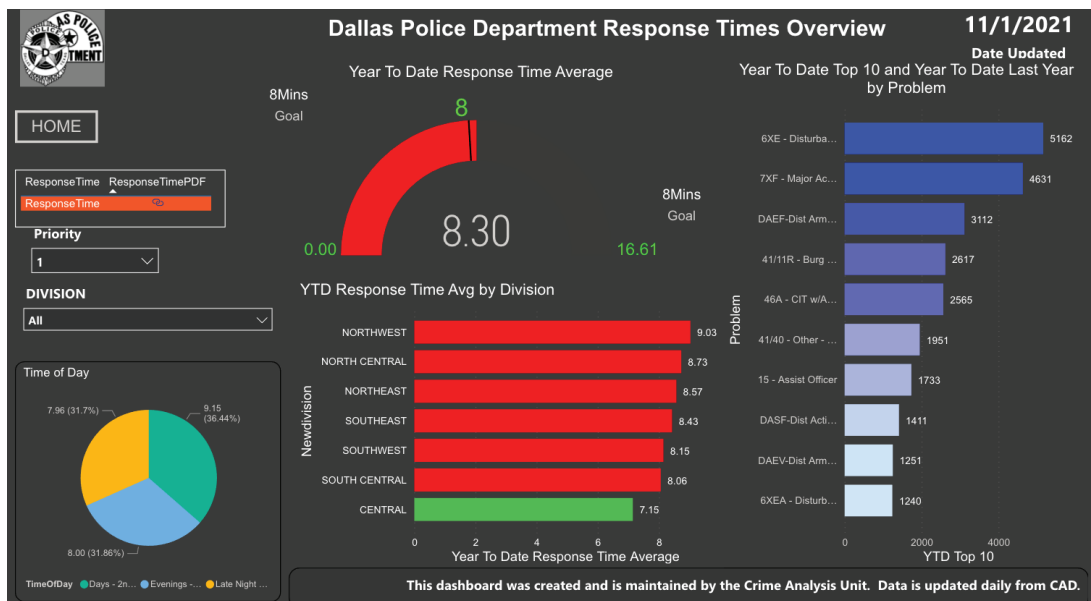
---

3. Examples 1–3 are taken from the Dallas (Texas) Police Department's public-facing dashboard system: <https://app.powerbigov.us/DallasPDDashboard>.

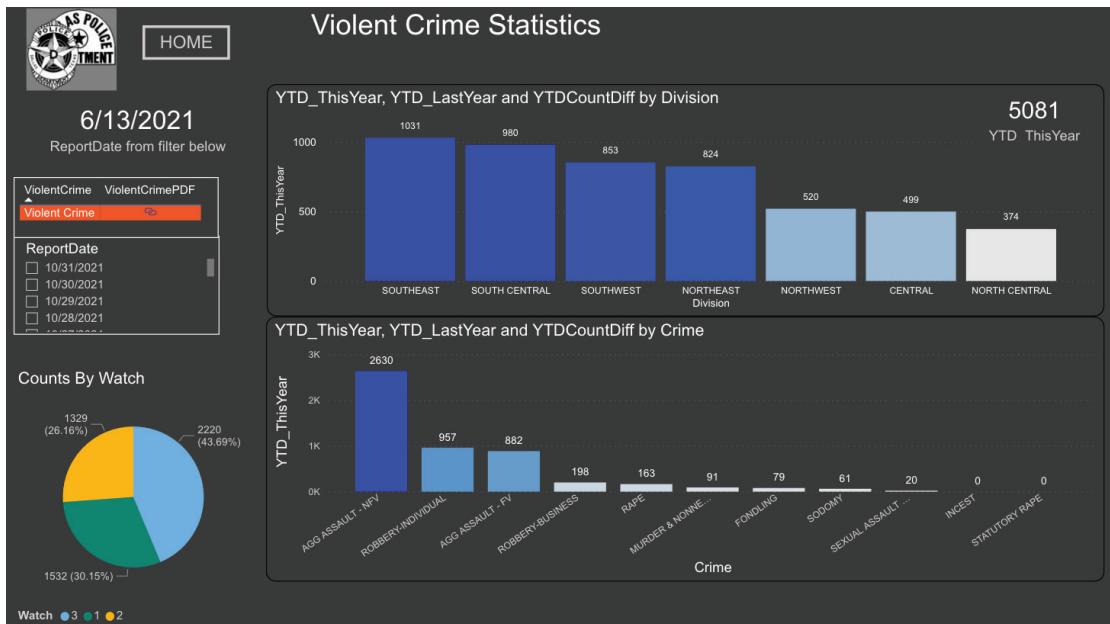
**Example 1. A starting page or menu of dashboards**



**Example 2. Calls for service**

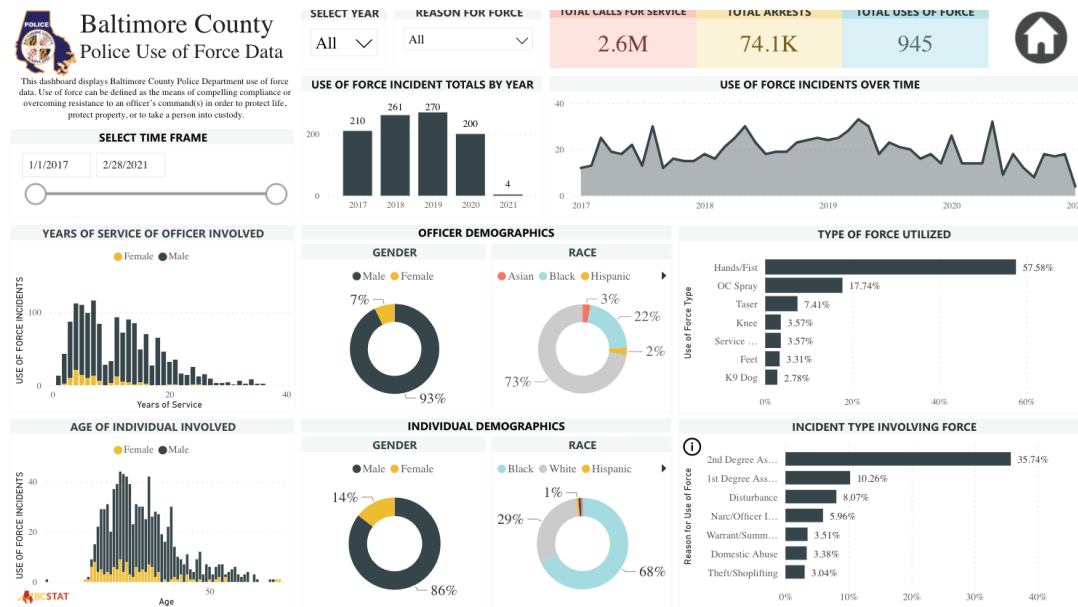


**Example 3. Violent crime statistics**



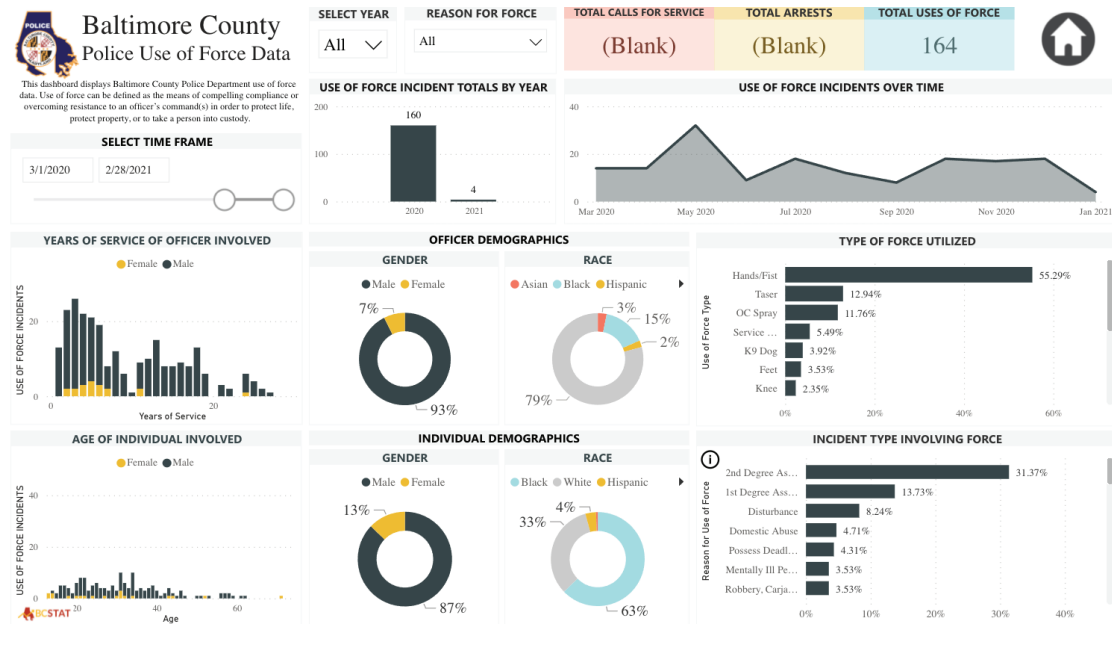
Examples 4–5 illustrate filtering capabilities.<sup>4</sup>

**Example 4. Police use of force data, with no filter**



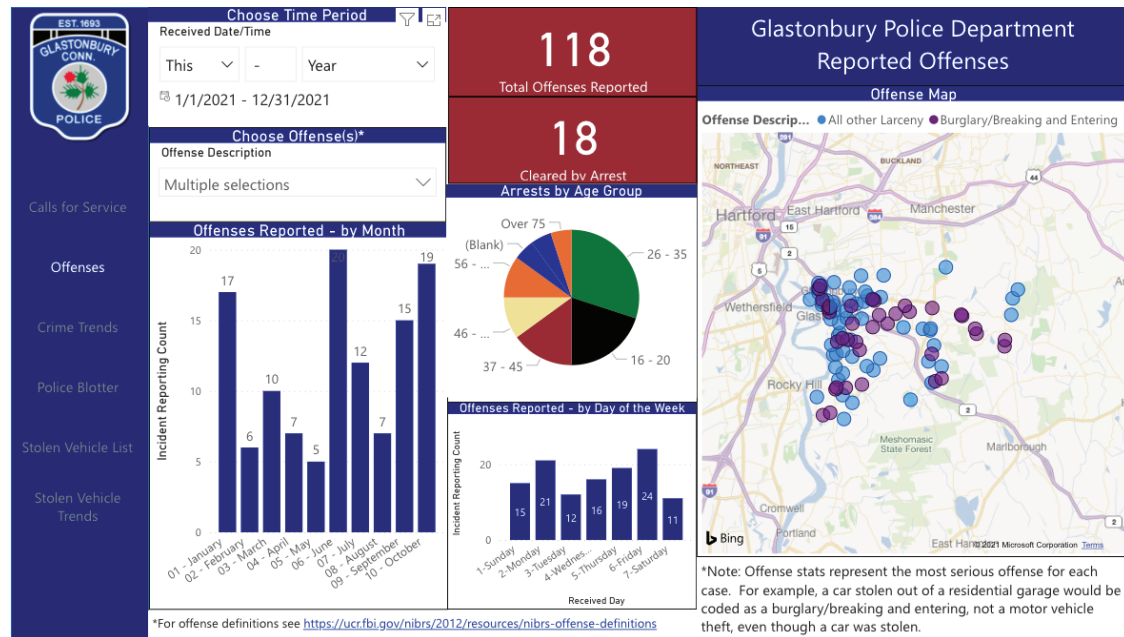
4. Examples 4–5 are taken from Baltimore County (Maryland) Police Department’s public-facing dashboard system: <https://app.powerbigov.us/BaltimoreCo>.

**Example 5. Police use of force data, with a filter applied showing data within the last year using the *Select Time Frame* slider.**



Example 6 illustrates the use of a map.<sup>5</sup>

**Example 6. Larceny and burglary offenses reported in the current year**



5. Example 6 is taken from the Glastonbury (Connecticut) Police Department’s public-facing dashboard system: <https://www.glastonburyct.gov/policedepartment>.

### 1.3 Document References

In developing this Concept of Operations document, project leaders held discussions and meetings with all divisions within the SPD. As part of this process, the project team produced or collected the following documentation.

<b>Document Name</b>	<b>Description</b>
Dashboard Example.pdf	A collection of example dashboard visualizations from web searches of other agency's public dashboards.
CAD Data Dictionary.pdf	The CAD database data dictionary including entity relationship diagrams.
RMS Data Dictionary.pdf	The RMS database data dictionary including entity relationship diagrams.
Meeting Minutes.pdf	A collection of minutes from meetings with project leaders and stakeholders that provide suggestions for dashboards.
Questionnaire Analysis.xlsx	A spreadsheet describing the questions and results of a questionnaire presented to agency staff regarding the need and ideas for dashboards.



## 1.4 Glossary

<b>Term</b>	<b>Definition</b>
CAD	Computer Aided Dispatch. Data system used by agency to collect, manage, and store data related to calls for service.
CJIS	Criminal Justice Information Services. The information technology and information sharing service used by law enforcement agencies.
Dashboard	A data analysis tool that calculates and displays select performance measures important to a given audience.
Command staff	Agency personnel with the ability to allocate and assign agency resources to day-to-day tasks. Command staff includes sergeants, lieutenants, shift commanders, and senior officials.
Crime analysts	Agency personnel responsible for collecting, managing, and reporting crime patterns and other crime indicators using analytic tools to help prevent future crimes.
KPI	Key Performance Indicator. A set of quantifiable measures that an agency uses to assess its performance over time. KPIs are normally used to evaluate the success of an agency or department.
Metric	A standard measure or category of data.
RMS	Records Management System. The computer application/data system used for the storage, retrieval, retention, manipulation, archiving, and viewing of information, records, documents, or files pertaining to law enforcement operations.
Senior leadership	Agency personnel responsible for setting the agency strategic direction, managing all other agency staff, liaising with the city government, and overseeing the general administration of the agency.
Visualization	Data presentation in a graphical form, such as a chart, graph, table, or gauge.

## 2.0 Goals, Objectives, and Rationale for the New System

### 2.1 Goals and Objectives of the Dashboard System

The goal of the proposed dashboard system is to provide the public, agency leadership, and other staff the ability to better understand and evaluate the performance of key metrics relevant to each audience. The objectives of the system are to connect data from the CAD, RMS, county geographic information system (GIS), and other data systems to communicate information to agency staff and the public by performing the following functions and providing the following capabilities:

- Use current and historical data to help predict future policing needs.
- Use data visualizations to convey meaningful performance information to decision-makers and consumers.
- Make relevant police performance data available to the public.
- Make relevant information available to departmental managers to track performance and identify issues.
- Update the data automatically.
- Allow multiple platforms, such as mobile browsers, to access the dashboards.

### 2.2 Rationale for the Dashboard System

#### *2.2.1 Modes of operation for the proposed system*

The use of dashboards will allow internal users access to data that can help them better understand their current operations and make more informed decisions. The dashboards will be designed to help decision-makers align strategies with agency objectives by providing data focused on the objectives. Visualizations enable viewers to quickly identify data trends, outliers, or anomalies.

- Automated procedures will regularly update the data used by the dashboards.
- While not a 24/7 mission-critical system, the dashboard is expected to be operational most of the time, relying on automated procedures to maintain the current state of the data. Designated agency staff will perform changes to the dashboard. Agency IT staff will monitor the system daily to ensure that the system is operating as expected.

### *2.2.2 User descriptions*

The proposed system is expected to be used by the following groups:

- Senior leadership will have access to dashboards providing information related to agency key performance indicators (KPI).
- Command staff will have access to dashboards to ensure that adequate resources are available for assignment.
- Crime analysts will use dashboards to identify trends and anomalies and assist with investigations.
- Agency staff will use the dashboard system when arriving on shift to review the current state of operations and make any changes or adjustments to work priorities.
- Public viewers of the dashboard can monitor crime metrics of general interest, such as the location of incidents calls for service and response times.

### *2.2.3 Support environment of the proposed system*

Internal IT staff will support and maintain the dashboards. They will monitor the daily activity logs and server logs and perform any maintenance to ensure that the dashboard is operational. If a programming change is required, the IT staff will contact the vendor.

As requirements for new dashboards arise, agency IT staff will have the capability to generate new visualizations and create new dashboards. As new data sources are identified, agency IT staff will work with the data custodians to acquire and integrate this data into the dashboard environment.

## **3.0 Work Processes to Be Automated/Supported**

This section provides an example use case for each user group and describes each work process and how a new dashboard system will improve that process.

- **Senior leadership.** The chief requires all captains to report progress, currently through monthly written reports, toward the agency goals of improving community relations and communications, using data to set policing policy related to crisis interventions and contacts with minorities, and reducing complaints against officers.

Rather than relying on these monthly reports, the new dashboard system will provide the chief and senior leadership with up-to-date data to monitor the status of these metrics. The chief's dashboard could include metrics and visualizations related to bias/hate crimes, violent crime, use of force, homeless contacts, and how the crisis intervention team is impacting the number of arrests. It could also include statistics related to citizen complaints, such as the officers named, nature of the incident, and incident date, time, and location, and allow the chief to pull up the incident report for details that led to the complaint. Other strategic dashboard visualization could focus on crime statistics by location, date, time, and crime type so the chief can accurately provide information to the city council and the public.

- **Command staff.** The patrol supervisors need to know the details of officer activities, officer and detective caseloads, when and where crimes occurred, and data related to relationships between crimes, who is involved, mode of operation, specific victim targets, and other trends and patterns that help the supervisors focus resources.
  - ▲ Currently, command staff receives daily activity reports that are produced by the CAD and RMS. These reports are produced each day and do not include trends or analysis. The proposed dashboard system will provide the command staff with more complete data analysis capabilities.
- **Crime analysts.** Analysts need specific dashboards that allow them to select a period of time, crime type, and offender and victim demographics to display trends on a graph.
  - ▲ Data analysts use extracted data from the CAD and RMS to develop their own spreadsheets and charts. The dashboard system will allow analysts to save time by having the data curated and available. It will also provide the analysts with tools to sort, filter, and compare data over time and present the data graphically.
- **Agency staff.** All agency staff need to have situational awareness. This is currently accomplished by sharing information verbally during roll-call and other staff meetings.
  - ▲ Internal dashboards will provide agency staff with information to keep them apprised of current events that could affect their day-to-day activities.
- **Public.** Currently the public receives limited information through press releases and social media. The public dashboard will include items such as crime trends over time and by location, including breakdowns to differentiate between violent and non-violent crimes, and statistics on bias/hate crime and use of force. It will also include statistics on incident counts by crime type, dates, times, and locations.

## 4.0 Functional Requirements

### 4.1 Required Features

This section describes the high-level features, capabilities, and functions of the proposed dashboard system (in contrast to the work processes to be automated, which are presented in sections 3.0 and 6.0).

- **Filters.** Users can use the dashboard filters to focus on specific items in the analysis, such as a certain crime type from a visualization of all crime types.
- **Sort results.** Users should be able to sort results by incident date, crime type, location, or other values associated with the visualization.
- **Time-based.** Users should be able to track activities and other items of interest over time, view trends, and anomalies.
- **Data from multiple sources.** Dashboard visualizations should be able to display data from multiple data sources—for example, calls for service from the CAD with related incident information.

## 5.0 Non-Functional Requirements

### 5.1 Required Capabilities

Non-functional requirements are the technical requirements that describe the capabilities needed to manage and support the environment of a dashboard system. These capabilities, which are used by the SPD system and database administrators, address the deployed environment of the dashboard system and include the following:

- **Security requirements.** These include the capability to
  - ▲ create and assign user accounts;
  - ▲ create and associate user accounts to user roles;
  - ▲ create and associate business rules to user roles;
  - ▲ create and associate dashboard functionality and data access privileges to user roles;
  - ▲ provide user authentication and authorization or integrate with external identity providers to enable single-sign-on user identity and authentication services.

- **Data administration, management, and integrity.** Data administration refers to the capability to establish and maintain the dashboard's underlying information model, a framework that organizes the data into groups, categories within groups, and elements within categories. The dashboard application should allow the SPD system administrator to
  - ▲ design, configure, and maintain the underlying information model including derived and calculated fields, as well as mapping fields to outside data sources;
  - ▲ configure and maintain templates for tables, charts, graphs, and presentations;
  - ▲ generate data dictionary reports and data relationship diagrams;
  - ▲ create scheduled and ad hoc backups;
  - ▲ restore backups;
  - ▲ mark a data element as sensitive or confidential;
  - ▲ generate scheduled and ad hoc connections to data source;
  - ▲ create and monitor activity and audit logs.
  
- **Application administration.** The SPD developer needs to provide user and technical documentation so the SPD IT staff can administer the application. This documentation should provide guidance and instructions about the following:
  - ▲ The capabilities implemented: the attributes, characteristics, and qualities of the system
  - ▲ Environmental and architecture requirements: database platform, server requirements, etc.
  - ▲ How to customize and configurable user-defined fields, forms, and reports
  - ▲ How to configure system-to-system interfaces
  - ▲ Manuals for the end-users

- **Application user interfaces.** A well-designed dashboard is intuitive and easy to use. Training requirements should be minimal. Dashboards should be designed with the following principles in mind:
  - ▲ Design and name fields using terminology familiar to the audience.
  - ▲ Associate fields with screens, tables, charts, graphs, and presentations.
  - ▲ Create conditional navigations (filters and drill downs).
  - ▲ Create field-level help content, e.g., “hover hints”.
  - ▲ Create on-demand training content.
- **Service-level requirements.** These describe the requirements for system availability, maintainability, performance, and user support that will be included in a Service Level Agreement.

## 5.2 Deployment and Support Requirements

Deployment and support of the new dashboard system will follow the enterprise architecture (EA) strategy set forth by city information technology standards. These standards provide a selection of reusable standardized services that allow the agency to use city technical services to maintain the integrity and security of agency data. The dashboard will be able to integrate into the enterprise services in the ways described in section 5.4, System Environment.

## 5.3 Configuration and Implementation

SPD dashboard user interfaces should be browser-based and deployable on a variety of browsers across all devices, including desktops, laptops, tablets, and smartphones.

## 5.4 System Environment

The new dashboard system must operate in the City of Springfield enterprise architecture (EA) environment:

**Enterprise Network Services** provide the communication infrastructure between locations, facilities, and systems, as well as connectivity to law enforcement, courts, and other justice data sources. The dashboard system should not require any custom network configurations; instead, it should be “network agnostic” and capable of using standard network protocols for security, reliability, functionality, and information sharing.

**Enterprise Hosting Services** provide the hardware and system software infrastructure—servers, database storage, operating systems—to support the dashboard environment. The dashboard should be capable of operating in a variety of hosted environments, whether local servers, enterprise servers, or cloud-based environments.

**Enterprise Data Services** provide technology offerings for data storage, access, availability, and security. Enterprise data services include data back-up, restoration, archiving, and recovery capabilities. Data security services provide encryption capabilities for data at rest and in motion and protection against malicious actors and data theft.

## 6.0 User Classes and Modes of Operation

### 6.1 User Roles

The responsibilities of each type of dashboard user or role are as follows:

- Senior leadership is responsible for reviewing internal dashboards focused on agency-wide goals and objectives.
- Command staff is responsible for reviewing internal dashboards to ensure that adequate resources are assigned.
- Crime analysts are responsible for reviewing internal and external dashboards to identify trends and anomalies.
- Agency staff are responsible for reviewing dashboards when arriving on shift for situational awareness.
- Any member of the public may review visualizations of general interest, such as calls for service, response times, and crime maps.



## 6.2 User Roles Mapped to Functional Features

Table 1 shows examples of dashboard visualizations of use to each user group.

**Table 1. Example dashboard visualizations**

User Group	Visualization
Senior leadership	<ul style="list-style-type: none"> <li>Crime rates aggregated from lower-level crime measures</li> <li>Clearance rates aggregated from lower-level clearance measures</li> <li>Public safety trust rate aggregated from lower-level public safety trust measures</li> <li>Use of resources rate aggregated from lower-level community service measures</li> <li>Community service satisfaction rate aggregated from lower-level community service measures</li> </ul>
Command staff	<ul style="list-style-type: none"> <li>Counts of incident statistics (by crime, by date range, location, etc.)</li> <li>Counts of offenses committed while under the influence of alcohol or drug by crime, offender demographics, cleared/uncleared</li> <li>Cleared/uncleared analysis by officer, by crime, backlog</li> <li>Calls for service statistics</li> <li>Proportion of total police staff on active crime duty, in court appearances</li> </ul>
Crime analysts	<ul style="list-style-type: none"> <li>Counts of victim and offender demographics by crime, location, time</li> <li>Counts of bias/motivation indicators by crime, offender demographics, time, location, cleared/uncleared</li> <li>Counts of subject or officer use of force, type of force, injuries, fatalities, subject and officer demographics</li> <li>Proportion of firearms matched to state firearms sales and owner registration databases</li> <li>Domestic violence statistics</li> </ul>
Agency staff	<ul style="list-style-type: none"> <li>Rolling case backlog</li> <li>Distributions of encounters versus calls for service</li> <li>Agency-wide crime rate for property crimes</li> <li>Agency-wide crime rate for violent crimes</li> <li>Community service satisfaction rate by precinct</li> </ul>

User Group	Visualization
Public	<p>Counts of victim and offender demographics by crime, location, time</p> <p>Counts of bias/motivation indicators by crime, offender demographics, time, location, cleared/uncleared</p> <p>Counts of subject or officer use of force, type of force, injuries, fatalities, subject and officer demographics</p> <p>Counts of incident statistics (by crime, by date range, location, etc.)</p> <p>Domestic violence statistics</p>

### 6.3 Sample Operational Scenarios

- SPD senior leadership needs to provide an update to the city council on how the crisis intervention team impacts use of force, officer and subject injuries, citizen complaints, and alternatives to arrests.
- A command lieutenant uses the internal dashboards to understand when and where property crimes are occurring to focus patrols to help prevent these thefts.
- Crime analysts need to provide the chief with a breakdown of the response times to calls for service during the graveyard shift for the last year.
- SPD staff needs to review the backlog of cases to ensure that they are meeting their reporting requirements.
- The public wants to see vehicle theft incidents over the last month plotted on a map of the city with the ability to click on the incident and see when the incident occurred and whether that incident resulted in an arrest.

## 7.0 Impact Considerations

### 7.1 Operational and Organizational Considerations

The SPD intends to hire a vendor to assist with the initial development and implementation of the new dashboard system. The SPD has adequate funds set aside for information technology improvements that will be used to implement the new dashboard system. The agency will issue a request for proposal (RFP) to select a vendor for this project.

The current operational environment that supports the CAD and RMS is managed by the Springfield IT department and will support the additional services to be implemented for the dashboard system.

The SPD will establish Service-Level Agreements for operational services following existing practices with the city IT department to support the existing dashboards and to develop new dashboards and the automated data transfers used by the dashboard system. The SPD will establish a new Service-Level Agreement (SLA) with the vendor/developer to support the dashboard platform and include similar requirements to the current CAD and RMS.

Any new services created during the dashboard system implementation will comply with the security protocols in place for the agency. These include role-based security, dual factor authentication, and monitoring of access logs. The IT staff will add any new services by following the existing change management process and include any changes to the backup and recovery plan as needed.

Once the new dashboard is implemented, SPD IT staff will add dashboard support services equivalent to the services they provide for the CAD and RMS systems currently in place. Updates to the datasets used by the dashboards will be performed automatically and under the SLA; IT staff will monitor the status of these functions on a real-time basis and respond to users' issues as reported to the city IT helpdesk.

There will be an initial resource cost incurred during the development project, which will include staff time to assist with requirements and testing. Once the dashboard is implemented, there should be a cost savings realized because IT and SPD staff will need to run fewer routine statistical and operational reports.

Currently, the project is scheduled to begin at the start of the fiscal year (January 1, 2020) and last 6–9 months.

## 7.2 Potential Benefits and Risks

### 7.2.1 Summary and examples of potential dashboard benefits

User Group	Benefit
Senior leadership	Gain insights into overall agency KPIs and be able to answer policy questions; quickly and accurately monitor progress toward agency goals and objectives: for example, how the crisis interaction team has reduced arrests for mental health calls, or how implementing license plate readers has impacted the recovery of stolen vehicles.
Command staff	Understanding crime rate trends will allow command staff to focus patrols to high-crime rate areas during high-crime activity times. Monitoring changes in resource allocation versus crime activity will allow decision makers to manage resources to best protect the public.
Crime analysts	Crime analysts will be able to provide historical crime analytics to identify trends that can influence future decision-making: for example, how the weather affects crime rates or the influence of socioeconomic factors on crime.
Agency staff	Agency staff will be provided metrics showing data related to daily operations. The main purpose of operational dashboards is to provide a comprehensive snapshot of performance, which means that agency staff will be presented a large amount of detail at a glance: for example, workload dashboards for case backlog, resource assignments, and focused patrols.
Public	Public will have access to data, providing data transparency and accountability. By providing a public dashboard, the agency can demonstrate performance and improve public perception and trust.

Both SPD staff and the public dashboard users should realize time savings by using the dashboards to answer frequently asked questions. Agency staff will benefit by receiving fewer telephone or email inquiries and corresponding research work to answer these, and the public will benefit by having immediate access to commonly requested information and data.

All dashboard users will benefit from the following:

- All dashboards will allow users to customize their views to quickly find information that is most relevant to them. This should result in time savings for command staff, department supervisors, patrol officers, crime analysts, and the public.
- Providing the dashboards should lower the level of technical skills needed by SPD staff. Dashboard users will be able to find their own data, which should allow crime analysts and IT staff time to focus on their other duties.

- There should be less redundancy. Two people requesting the same data will be able to access the same data quickly and easily, reducing the need for each person to run or request duplicate reports.
- Data will be available as needed to authorized users. Dashboard users will be able to find information on demand, making the entire department more efficient.

### *7.2.2 Summary of potential risks*

Potential drawback and risks include the following:

- IT staff will be required to develop and maintain the dashboards.
- Subject matter experts will be expected to participate in development activities while continuing their day-to-day duties.
- The cost of the dashboard project will come from the technology fund, which may impact the ability of the SPD to upgrade user computers, software, or other IT infrastructure until the fund can be replenished.

## 7.3 Assumptions and Constraints

### *7.3.1 Summary of assumptions*

The SPD has identified the following assumptions behind its plans for the new dashboard system:

- The SPD will be responsible for managing and funding the dashboard.
- The SPD will work with the City Information Technology Services Division to acquire the necessary capabilities to implement and host the dashboard.
- The SPD has the technical capability to support and maintain the dashboard system, including the tasks of acquiring and curating the data using either internal or external resources.
- Data providers are willing to participate in the project and provide data that is accurate, consistent, and refreshed on a daily basis.

### *7.3.2 Summary of constraints*

The SPD has identified the following constraints on implementing a new dashboard system:

- The SPD's information security policies limit the sharing of criminal justice information outside of the SPD. Therefore, internal dashboards will need role-based security rules. The public-facing dashboard will not include any personally identifiable data. All public-facing crime maps will obscure exact location information.
- The SPD has budgeted \$200,000 for information technology improvements that may be used to implement a new dashboard system. The SPD must follow city purchasing policies to select a vendor for this project. Depending on proposals received, the scope of the new dashboard system may need to be limited.
- Resource constraints to implement, maintain, and support the dashboard system include agency analyst and IT staff time, as well as user time for requirements gathering. The project participants will need to continue their day-to-day duties, which may limit the amount of time they can focus on the project. Once the new dashboard system is in place, the IT staff or a vendor will need to maintain and support the new dashboard system.
- Proceeding with the project and securing the funds to do so requires approval of the city council.

# Appendix A. Concept of Operations Template

The ConOps example for the Springfield Police Department uses a common narrative format. The following template may simplify and to assist with developing a Concept of Operations for any project.

## CONCEPT OF OPERATIONS:

**Project Name:**

**Agency Name:**

**Date:**

## 1.0 Introduction

### 1.1 Project Description

*Include an overview of the project and expected outcomes.*

#### 1.1.1 Background

*Summarize background on the project. Explain why the improvements are needed.*

#### 1.1.2 Project Authorization

*State under whom or what authority the ConOps is being developed.*

### 1.2 Overview of the Proposed System

#### 1.2.1 Overview

*Describe the proposed system – this is a summary of the more detailed discussion related to the capabilities, functions, and features from Section 4.0 of the ConOps.*

### 1.2.2 System Scope

*Estimate of the size and complexity of the envisioned system.*

### 1.3 Document References (if needed)

*List the documents that are sources for the ConOps. Include meeting summaries and online research, as well as any other documents.*

### 1.4 Glossary (if needed)

Term	Definition

## 2.0 Goals, Objectives, and Rationale for the New System

### 2.1 Goals and Objectives of the New System

*State the overall goals and objectives of the proposed system and the business problems that will be solved.*

### 2.2 Rationale for the New System

*Explain why the new system (or change) is needed. If the need is for improvements to an existing system, clearly identify the existing systems that must be changed. This section may also include modes of operation, user descriptions, and the support environment for the proposed system.*



## 3.0 Work Processes to be Automated/Supported

*Describe each major process and function or the specific steps that the proposed system will automate.*

## 4.0 Functional Requirements

### 4.1 Required Features

*Describe general requirements of the features, capabilities, and functions of the system.*

### 4.2 Additional Features (if needed)

*Describe any additional features that would enhance the utility or usability of the system.*

## 5.0 Non-Functional Requirements

### 5.1 Required Capabilities

*Describe the non-functional requirements. This includes the capabilities needed to manage the environment of the proposed system. Include brief descriptions of the security, data and application administration, user interfaces, architecture integration, and service-level agreements.*

### 5.2 Deployment and Support Requirements

*Discuss any deployment and support considerations for the proposed system.*

### 5.3 Configuration and Implementation

*Discuss any operational policies and constraints that may affect the proposed system.*

## 5.4 System Environment

*Describe the environment that the proposed system will need to operate in. Include the network, hosting, data, and business services that the proposed system will need to conform to.*

# 6.0 User Classes and Modes of Operation

## 6.1 User Roles

*Describe the user roles of the proposed system, as well as those who will provide support. List responsibilities for each type of user or role listed.*

## 6.2 User Roles Mapped to Functional Features

The following table outlines examples of user scenarios for each user or support role.

User Group	Functional Feature list
User Role 1	
User Role 2	

## 6.3 Sample Operational Scenarios

*List how each user role will interact with the system, and the inputs and outputs that each user role can expect.*

# 7.0 Impact Considerations

## 7.1 Operational and Organizational Considerations

*Describe the operational and organizational impacts that the proposed system should have on the agency. Include any added costs and benefits, improvements anticipated, and workload or resource impacts. Address how the development and implementation of the new dashboard system may impact the day-to-day operations and how long it will take to realize improvements.*

## 7.2 Potential Benefits and Risks

*Describe the anticipated benefits and any possible drawbacks that the proposed system may have on the agency and discuss other options that were considered.*

## 7.3 Assumptions and Constraints

7.3.1 The following assumptions have been identified for a proposed system:

*List any assumptions.*

7.3.2 The following constraints have been identified for a proposed system:

*List any constraints.*



# Appendix B. Law Enforcement Data Dashboards

## Project Advisory Committee Members

**Marjolijn Bruggeling**

Associate Director of Policing  
Innovation and Reform  
University of Chicago Crime Lab

**Thomas Casady**

Former Director of Public Safety  
Lincoln (NE) Department of Public Safety

**Brian Corr**

Past President  
National Association for Civilian  
Oversight of Law Enforcement

**Stella Cziment**

Acting Independent Police Monitor  
City of New Orleans, Louisiana

**Adrian Diaz**

Chief of Police  
Seattle (WA) Police Department

**Kim Engie**

Data Science Lead  
Open Lattice

**Jordan Fankhauser**

Crime Analyst  
San Diego (CA) Police Department

**Anna Godwin**

Research Data Scientist  
Center for Data Science, RTI International

**Gina V. Hawkins**

Chief of Police  
Fayetteville (NC) Police Department

**Susan Hutson**

President  
National Association for Civilian  
Oversight of Law Enforcement

**Nola Joyce**

Former Deputy Police Commissioner  
Philadelphia (PA) Police Department

**Rick Meggison**

Former Director of Public Safety and  
Justice Consulting  
Gartner

**Charles Penny**

Police Lieutenant  
Raleigh (NC) Police Department

**Joseph Porcelli**

Global Public Agency Lead  
Nextdoor

**Julian Sanchez**

Senior Fellow  
Cato Institute

**Jeffrey Sedgwick**

Executive Director  
Justice Research and Statistics Association

**Mike Sena**

President  
National Fusion Center Association

# Resources

Cellucci, Tom. 2009. *Developing Operational Requirements – A Guide to the Cost-Effective and Efficient Communications of Needs, version 2.0*. Washington, DC: Department of Homeland Security. [https://www.dhs.gov/xlibrary/assets/Developing\\_Operational\\_Requirements\\_Guides.pdf](https://www.dhs.gov/xlibrary/assets/Developing_Operational_Requirements_Guides.pdf).

Geraghty, Lena, Kristen Ahearn, and Matthew Raifman. 2016. *Investigating Seattle Police Department's SeaStat*. Baltimore, MD: Center for Government Excellence, Johns Hopkins University. <https://govex.jhu.edu/wiki/seastat-casestudy>.

IEEE. "IEEE Guide for Information Technology - System Definition - Concept of Operations (ConOps) Document." 1998. In *IEEE Std 1362-1998*, pp.1-24, December 22. <https://ieeexplore.ieee.org/document/761853>.

Justice Management Division. 2003. *Information Resources Management: The Department of Justice Systems Development Life Cycle Guidance Document*. Washington, DC: Department of Justice, Justice Management Division. <https://www.justice.gov/archive/jmd/irm/lifecycle/table.htm>.

Klipfolio. 2022a. "What is a data dashboard?" Accessed April 5, 2022. <https://www.klipfolio.com/resources/articles/what-is-data-dashboard>.

———. 2022b. "What is a KPI?" Accessed April 5, 2022. <https://www.klipfolio.com/resources/articles/what-is-a-key-performance-indicator>.

Law Enforcement Information Technology Standards Council. 2008. *Standard Functional Specifications for Law Enforcement Records Management Systems Version II*. Washington, DC: Bureau of Justice Assistance. <https://www.theiacp.org/sites/default/files/all/k-m/LawEnforcementRMSv2.pdf>.

Office of Management and Budget. 1994. *Operational Concept Description (OCD)*. Data Item Description DI-IPSC-81430. Washington, DC: Office of Management and Budget. <https://www.product-lifecycle-management.com/download/OCD-DID.PDF>.

Police Executive Research Forum. 2013. *COMPSTAT: Its Origins, Evolution, and Future in Law Enforcement Agencies*. Washington, DC: Bureau of Justice Assistance. <https://bja.ojp.gov/sites/g/files/xyckuh186/files/Publications/PERF-Compstat.pdf>.

SEARCH Group, Inc. 2002. *Law Enforcement Tech Guide: How to Plan, Purchase, and Manage Technology (Successfully!)*. Washington, DC: Department of Justice, Office of Community Oriented Policing Services. <https://cops.usdoj.gov/RIC/ric.php?page=detail&id=COPS-P042>.

Zuckerman, Arthur. 2015. "A Detailed Look at the History of Business Intelligence Software." <https://comparecamp.com/detailed-look-history-business-intelligence-software/>.

# About SEARCH

**SEARCH, the National Consortium for Justice Information and Statistics**, is a nonprofit organization governed by a membership group of governor appointees from the 50 states, the District of Columbia, and the territories.

SEARCH has 53 years of experience supporting the information sharing, information technology, cybercrime investigative and digital forensics, and criminal records systems needs of state, local and tribal justice and public safety agencies and practitioners nationwide.

SEARCH's purpose is to

- improve the administration of justice through the effective application and responsible deployment of information and identification technologies;
- develop and promote constitutionally balanced and effective law and policy governing the use and management of justice information and identification technologies;
- enhance the efficiency, effectiveness, and quality of decision-making and information management through policy analysis, training, technical assistance, and systems development;
- inform and improve policy and practice in the administration of justice through evidence-based research and data.

For more information on SEARCH and its products, services, and resources, see [www.search.org](http://www.search.org).



# About PERF

The **Police Executive Research Forum (PERF)** is an independent research organization that focuses on critical issues in policing. Since its founding in 1976, PERF has identified best practices on fundamental issues such as police use of force; developing community policing and problem-oriented policing; using technologies to deliver police services to the community; and evaluating crime reduction strategies.

PERF strives to advance professionalism in policing and to improve the delivery of police services through the exercise of strong national leadership, public debate of police and criminal justice issues, and research and policy development.

In addition to conducting research and publishing reports on our findings, PERF conducts management studies of individual law enforcement agencies; educates hundreds of police officials each year in the Senior Management Institute for Police, a three-week executive development program; and provides executive search services to governments that wish to conduct national searches for their next police chief.

All of PERF's work benefits from PERF's status as a membership organization of police officials, who share information and open their agencies to research and study. PERF members also include academics, federal government leaders, and others with an interest in policing and criminal justice.

All PERF members must have a four-year college degree and must subscribe to a set of founding principles, emphasizing the importance of research and public debate in policing, adherence to the Constitution and the highest standards of ethics and integrity, and accountability to the communities that police agencies serve.

PERF is governed by a member-elected President and Board of Directors and a Board-appointed Executive Director.

To learn more, visit PERF online at [www.policeforum.org](http://www.policeforum.org).

# About the COPS Office

The **Office of Community Oriented Policing Services (COPS Office)** is the component of the U.S. Department of Justice responsible for advancing the practice of community policing by the nation's state, local, territorial, and tribal law enforcement agencies through information and grant resources.

Community policing begins with a commitment to building trust and mutual respect between police and communities. It supports public safety by encouraging all stakeholders to work together to address our nation's crime challenges. When police and communities collaborate, they more effectively address underlying issues, change negative behavioral patterns, and allocate resources.

Rather than simply responding to crime, community policing focuses on preventing it through strategic problem-solving approaches based on collaboration. The COPS Office awards grants to hire community policing officers and support the development and testing of innovative policing strategies. COPS Office funding also provides training and technical assistance to community members and local government leaders, as well as all levels of law enforcement.

Since 1994, the COPS Office has been appropriated more than \$20 billion to add community policing officers to the nation's streets, enhance crime fighting technology, support crime prevention initiatives, and provide training and technical assistance to help advance community policing. Other achievements include the following:

- To date, the COPS Office has funded the hiring of approximately 136,000 additional officers by more than 13,000 of the nation's 18,000 law enforcement agencies in both small and large jurisdictions.
- More than 800,000 law enforcement personnel, community members, and government leaders have been trained through COPS Office-funded training organizations and the COPS Training Portal.
- Almost 800 agencies have received customized advice and peer-led technical assistance through the COPS Office Collaborative Reform Initiative Technical Assistance Center.
- To date, the COPS Office has distributed more than eight million topic-specific publications, training curricula, white papers, and resource CDs and flash drives.

The COPS Office also sponsors conferences, roundtables, and other forums focused on issues critical to law enforcement. COPS Office information resources, covering a wide range of community policing topics such as school and campus safety, violent crime, and officer safety and wellness, can be downloaded via the COPS Office's home page, <https://cops.usdoj.gov>.



Data dashboards can help law enforcement agencies manage, analyze, and display actionable information in a user-friendly interface. This publication, *Developing a Concept of Operations Document*, is part of the three-part Designing an Effective Law Enforcement Data Dashboard series produced by the SEARCH Group, Inc and the Police Executive Research Forum. Intended for agency project managers, IT staff, and other stakeholders, it provides a roadmap for developing a concept of operations (ConOps) document for a law enforcement dashboard. The purpose of a ConOps is to ensure that all stakeholders share a common vision and understanding of a dashboard's capabilities; this publication includes checklists, templates, and a complete example dashboard that readers can modify.

Each publication in this series is based on research and consultation with law enforcement leaders and subject matter experts and contains examples of real-world operational dashboards and tips for planning, designing, implementing, and sustaining data dashboards in a law enforcement agency.



**COPS**

Community Oriented Policing Services  
U.S. Department of Justice

U.S. Department of Justice  
Office of Community Oriented Policing Services  
145 N Street NE  
Washington, DC 20530

To obtain details about COPS Office programs,  
call the COPS Office Response Center  
at 800-421-6770.

Visit the COPS Office online at [cops.usdoj.gov](https://cops.usdoj.gov).