

Lessons from Leading CDOs: A Framework for Better Civic Analytics

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and Innovation*

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EXECUTIVE SUMMARY

A Chief Data Officer (CDO) can lead a city or state toward greater data-driven government. Data-driven executive leadership in government is relatively new, with just over a dozen cities and a handful of states having named a CDO as of late 2016. Leveraging data enables more responsive and rational allocation of government resources to address priority public needs. There is growing momentum and increasingly frequent news of the next government CDO appointment. While there is a growing proliferation of CDOs in government, there are few resources that describe the landscape, either for the benefit of the chief executive appointing a CDO or the new CDO taking office. This paper intends to help new entrants by documenting selected current practices, including advice shared by existing government CDOs, observations by the author, and analysis from government technology and analytics experts. A few key points for a new CDO to consider include:

- *Support from the chief executive sets the CDO up for success.* Whether a CDO reports to the chief executive (mayor, governor, or county commissioner) or not, it is important to have the support of that chief executive and have the resources, credibility, and authority that go along with executive sponsorship.
- *Basic management skills can accelerate progress.* Strong basic management and leadership skills, the ability to clearly articulate the mission and roadmap to achieving it, and the ability to hold staff accountable for results will accelerate success for a CDO. Standardizing tools and processes, including project management tools, will make the work more efficient. Balancing the demand for results with the need for foundational data stewardship demands leadership from a CDO and a delicate balance of people and technology skills.
- *Data stewardship can create the conditions for solid analytics.* Data stewardship—comprising data governance and data infrastructure—lays the foundation on which analytics is built, and whether these activities are part of the CDO operation or not, they are essential to the success of any analytics program.

- *Setting priorities becomes an increasingly important and challenging task for a successful CDO.* As the profile of the CDO grows and demand for services increases, it can be difficult to manage priorities and stay true to the mission. As one expert advised, CDOs should stay focused on important policy issues and operational improvements in government, and avoid “data qua data” analytics.

This paper describes an operational framework for the role of a CDO office, and provides observations on fostering a data culture in government.

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INTRODUCTION

Within the past year, a number of cities and states have created the position of Chief Data Officer (CDO) to lead their efforts toward data-driven government. There is wide variation in the responsibilities of CDOs—some focus on open data programs, others focus on applying geographic information systems (GIS) tools to government problems, some preside over performance management, and still others are taking on advanced data analytics projects. The majority of new CDOs are appointed as the first and only employees on their team. A few start with a team already in place, and others are able to hire soon into their tenure.

Regardless of the size of their team or the scope of their responsibilities, CDOs share a common goal—to increase capacity for making data-driven decisions in government. Ideally, the work of a CDO results in greater value for the taxpayer dollar through better allocation of existing resources to meet the needs of the public.

In 2011, the city of Chicago appointed the first municipal Chief Data Officer (CDO). That same year, New York City Mayor Michael Bloomberg charged a team with a specific analytics task, and by 2013, that group became the Mayor’s Office of Data Analytics and began to take on applying analytics to citywide operations. These two pioneering cities along with others including Boston, Los Angeles, New Orleans, Philadelphia, Pittsburgh, and San Francisco created the earliest CDO offices and analytics programs from scratch using creativity and hard work—and no preexisting roadmap for a municipal CDO. The same is true for state CDO offices such as in Colorado, Connecticut, and New Jersey.

The CDOs in early-adopter cities created an informal network for peer support and sharing of best practices in 2014. In 2016 the group formalized as the Civic Analytics Network, supported by Harvard Kennedy School. The effort includes collaboration on shared analytics projects among network members with the Center for Data Science and Public Policy at the University of Chicago. Stephen Goldsmith, Daniel Paul Professor of the Practice of Government at Harvard Kennedy School, facilitates network convenings and provides thought leadership.

This paper documents operational insights generously shared by Civic Analytics Network participants along with observations from other CDO offices and external research sources. Describing the experience of pioneering CDOs is intended to make

it easier for those who follow in their footsteps. Just as the steam engine powered the industrial revolution, the creation of offices of data and analytics can power a new revolution in how government delivers services to the public by turning data into actionable insight.

APPOINTING A CHIEF DATA OFFICER

State, county, and city executives have named a new Chief Data Officer (CDO) nearly every month in the second half of 2016. The observations of experienced CDOs in this paper can offer insights that can create the conditions for success for a new CDO.

Senior Executive Sponsorship Sets the CDO up for Success

To be successful, a CDO must have a clear mandate from and the support of the chief executive. While a minority of city CDOs report directly to the mayor, having his or her support is important for success. One way a chief executive in government can demonstrate commitment is by issuing an executive order or policy statement about open data or the creation of the office of the CDO. Some mayors and governors have been quite public in their expressions of interest in data-driven government.

For example, Los Angeles CDO Lilian Coral credits the mayor's keen attention for her success in launching the open data performance [dashboards](#) as well as the easy-to-use public mapping site [GeoHub](#), which has increased both internal and external access and understanding of the city's open data. New Orleans analytics leader Oliver Wise credits his mayor's commitment to data-driven government with giving his office the authority to work as a trusted partner with city departments, enabling accomplishments ranging from reducing blight to increasing fire safety. Boston's [CityScore](#), a single citywide numerical score to measure the performance of key city services, has been a high priority for the mayor, and his sponsorship was critical to securing cooperation across departments for the data inputs.

A passionate sponsor who can clearly articulate the value of open data, data visualization, and analytics and can make that value concrete for both municipal employees and the public is an essential advocate for data-driven government efforts.

Who Does the CDO Report To?

Often, particularly in larger cities, Chief Data Officers in government today report to a Chief Information Officer, as is the case in Boston, Chicago, Minneapolis, Pittsburgh, and Washington, D.C. Some are embedded in the same organization as the performance office, as is the case in New Orleans, Louisville, San Diego, and Seattle. Some report to their mayor or to a deputy mayor, as is true in San Francisco and Los Angeles.

CDOs reporting directly to a mayor may be more likely to focus on projects with high visibility to the mayor and to the public, and as with other direct reports to a mayor, may operate under pressure to produce visible results quickly. Those CDOs not directly reporting to a mayor are more likely to be able to take on projects requiring more time to demonstrate results, including more methodologically complex analytics projects.

Comparing the CIO and the CDO Roles

Where there is already a Chief Information Officer (CIO), as is true in most big cities and in all states, naming a CDO provides a blank slate of opportunity—a chance to define a role with strategic priority to the chief executive. The role of a CIO can remain operational, keeping large IT projects moving forward and supporting enterprise-wide systems and platforms.

This opens the way for a CDO to take on the emerging and dynamic strategic role of defining how data can be used to create intelligence to improve performance. The CDO can unlock the value in data that the CIO stewards into existence.

Operations vs. Strategy: Key Differences Between CIO and CDO Roles		
Role	Key Data Responsibilities	Key External Partner Responsibilities
CIO	Build and maintain enterprise data systems that produce large volumes of data	<ul style="list-style-type: none"> • Run procurement process and select vendors • Manage vendor relationships • Identify and develop external pro bono partnerships
CDO	Use data in describing, mapping, and modeling to identify patterns and to derive business value and policy insight	<ul style="list-style-type: none"> • Work with contracted vendors • Identify, develop, and sustain external partnerships by working collaboratively on analytics projects. Partners can include the civic tech community, business partners for pro bono work, and academic partners

What's in a Name?

While Chief Data Officer is the predominant title given to leaders responsible for managing data and analytics in government, it is by no means the only title. Other titles given to this role include: Chief Analytics Officer, Analytics and Strategy Manager, Data Analytics Lead, and Director of Enterprise Level Data Management. As the most common title, CDO is used in this paper to refer to the portfolio of activities that create a data culture and enable greater use of data to drive decision-making.

Even the teams led by CDOs have a variety of names—in Boston it is the Citywide Analytics Team, in New Orleans the team is called NOLytics, in New York City it is the Mayor's Office of Data Analytics, and in San Jose it is the Data Analytics Team.

Does a CDO Have to Be a "Chief"?

A CDO will be more effective if he or she has the authority to lead, and to bring departments together for shared projects. Being of sufficient seniority to have peer-to-peer discussions with key operational leaders across government helps a CDO lead cross-departmental and cross-disciplinary projects. The "chief" title also signals the importance of the role to the government's chief executive.

STRATEGIC FRAMEWORK FOR A CHIEF DATA OFFICER

The scope of responsibilities for a CDO varies and can include any combination of the following: open data, data collection and data sharing standards, data management, performance management, geographic information system (GIS) and data visualization, and data analytics. Regardless of the scope, the CDO is a leader for data-driven government and some aspects of the job are common across all CDOs.

Many government CDOs, particularly newer ones, are in their early stages and have not yet formalized their strategies and operating models. The graphic below presents a framework for thinking about the components of a CDO role, from developing a strategy, to building a team and engaging with departments, to conducting analytics and fostering a citywide data culture.

While presenting these steps in a linear graphic may imply that there is a strictly linear relationship among the responsibilities, they are more often iterative. For example, while strategy necessarily comes first, it should be revisited periodically. And while building the team happens early, ideally it is ongoing either due to the success and growth of the team or due to naturally-occurring attrition and turnover.

Some parts of the framework may seem like “management 101,” but they merit discussion in the context of the challenge of being a new CDO, as a desire for fast or demonstrable results could crowd out attention to the “nuts and bolts” of organizational operations. Each element of the strategic framework is described in the pages that follow.



STRATEGY

The strategy phase includes setting a clear charter, developing a mission statement, and creating a roadmap for implementation, as described below.

Clear Charter

Strategy begins with the charge from the chief executive, which should answer key questions, such as: what role has the CDO been asked to play in government? Does the CDO report to the chief executive or is the CDO embedded in another part of government (IT, performance, innovation, budget office)? Is the CDO expected to take on the full scope of related tasks—open data, geographic information systems (GIS), and analytics, or will some subset of those tasks be in the charter? How does the CDO relate to other parts of government and how are responsibilities divided? What is expected on an annual and on a routine basis of the CDO by the chief executive (mayor, governor, county commissioner)? What resources have been provided to support the charter? Is the charter made clear across government in an executive order or other public document? How is the CDO being announced and introduced to peers within government?

Mission

With a clear charter from the chief executive, a CDO can define a mission, a concise statement of the difference the CDO can make in government over a three- to five-year time horizon. A mission statement is valuable in making clear to departments the types of support a CDO can provide, and just as importantly, the tasks that are out of scope.

For CDOs with a team larger than one, having a clear statement of mission provides direction to the team. Mission statements help a team prioritize, because everything should connect back to the mission. In a truly mission-driven organization, every team member knows the mission and can communicate it consistently to all stakeholders.

For example, the City of Chicago’s mission statement for the CDO office is “to use data to improve the quality of life of residents in the city and improve the efficiency of city operations.”¹ The New York City Mayor’s Office of Data Analytics’ mission is to be the city’s “civic intelligence center, allowing the City to aggregate and analyze data from across City agencies, to more effectively address crime, public safety, and quality of life issues. The office uses analytics tools to prioritize risk more strategically, deliver services more efficiently, enforce laws more effectively and increase transparency.”²

Implementation Roadmap

Building a roadmap lays out the steps and actions and the timeframe required to achieve them. A roadmap can take the form of a strategic plan or an implementation plan. A roadmap should identify the resources necessary to execute, including the skills needed and the process for identifying them. It should indicate the timeframe for each activity as well as who is responsible (staff, vendor, pro bono partner, etc.). It is helpful to update or revisit the roadmap on an annual basis.

Making a strategy or roadmap public is a great way to support both messaging efforts and also to build transparency. San Francisco has an excellent [one-page summary](#) of its data strategy. The summary contains the mission, vision, goals, and each element of the strategy. For each area of the strategic plan—services, tools, data repositories, outreach, and data governance—color coding tells the stage of completeness

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¹ Chicago Department of Innovation and Technology website, https://www.cityofchicago.org/city/en/depts/doi/provdrs/data_science.html

² New York City Mayors Office of Data Analytics website, <http://www1.nyc.gov/site/analytics/index.page>

for each activity. At one glance, city departments can see what the San Francisco CDO and team are doing and what they plan to do. This helps city departments understand how the CDO can help them improve their operations.

Having the charter in writing, whether in the form of a mission statement, strategy or implementation plan, builds clarity for the CDO team as well as for the rest of government.

ADVICE FROM THE FIELD

Be clear about what you will and will not do. One CDO warns that when going to departments to talk about analytics projects, “Inevitably, someone would ask me to fix their hardware or software problems. I can call the person to get it fixed, but that’s not the analytics role, and the customer in a department doesn’t see that, so it’s frustrating.” Another CDO says, “If your printer isn’t working, that’s not a data science problem.”

BUILDING A TEAM

A CDO is typically the first hire. Depending on the charge and the available resources, the CDO may be a one-person shop briefly or for an extended period. For CDOs who have the resources to build a team, the following pages address the issues to consider in creating the team.

Defining Roles

The size of a CDO team can be one, or a handful, or up to 30 in the largest operations. The roles and skills to be acquired in building the team will depend on the mandate and the scope for the CDO. Due to the wide variety of tasks asked of a CDO organization, generalists with strong analytical capabilities are often critical staff members. This is especially pronounced within the smallest organizations.

For a small team, each team member may wear multiple hats and take on a variety of tasks. Even in CDO offices that are planning to grow, staff will take on multiple roles in the early days. A small team should have a diverse set of skills because it is difficult, if not impossible, to find all the skills needed in one person, or in one type of person. Ideally, the team includes a range of complementary skills and backgrounds. A CDO is the leader who can create an environment where separate disciplines work in harmony toward the same mission.

The table below describes the range of tasks that can be part of creating a data-driven culture in government. These roles may be distributed across parts of government, such as in a performance office, an innovation office, or on the CDO team. The largest CDO teams incorporate many of the tasks below, while the smallest CDO offices may have one or two. The mix will vary based on the CDO mission.

Tasks and Typical Duties for Staff in a Government CDO Organization	
Task Type	Typical Duties
Business Process Analysis	<ul style="list-style-type: none"> • Study the problem to be solved and identify the policy result to be achieved, then clearly articulate the business process challenge to the department responsible for results. • Clearly articulate the goals of the analytics project and how it will create benefit. • Interact with department end users of analytics projects (many teams call this the “client-facing” role).
Data Analysis	<ul style="list-style-type: none"> • Clean and normalize large datasets. • Perform analytics to identify trends and underlying truths within a dataset. • Create business intelligence reports.
Data Visualization	<ul style="list-style-type: none"> • Use GIS and other platforms to create spatial and temporal maps of policy issues such that insights can be seen visually.
Data Modeling, Data Engineering, and Data Science	<ul style="list-style-type: none"> • Build and configure data infrastructure to facilitate analytics while ensuring accuracy, security, and reliability. • Clean and normalize large datasets. • Explore large datasets to look for patterns, trends and insights. • Develop sophisticated models applying decision science and/or machine learning to data problems. • Test models and refine based on test results. • Working with departments and other CDO staff, develop methods to operationalize models.
Performance Analysis	<ul style="list-style-type: none"> • For CDO offices with performance management responsibility, work with departments on tracking operational data for stat meetings.
Project Management	<ul style="list-style-type: none"> • For CDO offices with sufficient staff to have a dedicated project manager, keep large or long-term projects on track, and coordinate the efforts among the various skilled resources. In CDO offices without dedicated project management staff, the CDO can establish project management protocols and tools for the team.

Finding, Training, and Retaining Talent

The challenge of finding and hiring the right staff is significant, with many CDOs reporting that they have problems both finding the right staff and keeping them. Because data analytics in government is a new field, there isn’t an established career path or

a universal training ground. There are a handful of graduate programs to train students specifically for jobs in data science or analytics in the public sector. The University of Chicago Harris School has developed a Masters-level program to train students for public service data science roles and graduated its first class in 2016. New York University's Center for Urban Science and Progress also trains students to use analytics to address urban problems. Increasingly, analytics skills are being added to graduate program curricula, but it takes time for the new programs to produce results. Some government CDO offices hire graduates of public policy programs and train them in data analytics on the job.

ADVICE FROM THE FIELD

Hire based on curiosity and analytical thinking. Chief of Analytics for New York City, Dr. Amen Ra Mashariki, says, "I hire people based less on how well they match a profile of technical skills, more on whether they are curious and aggressive analytical thinkers."

Leveraging Partnerships to Create More Capacity

Many successful city CDOs extend their capacity with partnerships. For example, Pittsburgh CDO Laura Meixell has extended her team's capacity by partnering with nearby Allegheny County and the University of Pittsburgh. This collaboration resulted in a regional data center, which hosts a combined open data portal and links their open data to that of other public sector agencies, academic institutions, and nonprofit organizations.

Many CDOs partner with local educational institutions for fellows, PhD projects, and interns. Boston runs a successful summer fellow program that includes both graduate students and college interns who have worked on substantive projects, including a homelessness data warehouse. Taking on summer interns and fellows does take an investment of time, but it can have long-term value when the work product is good, and if used as a process to recruit and screen future full-time employees.

Some CDOs have received pro bono or steeply discounted help along the way. Los Angeles CDO Lilian Coral credits the team at GIS mapping partner Esri with delivering far more than expected when they helped her build the [GeoHub](#). New Orleans Analytics Director Oliver Wise has had outside help from UPS, Louisiana State University, Tulane University, and from a private-sector analytics firm.

Chicago CDO Tom Schenk has made extensive use of pro bono partnerships, with nearly \$1 million in in-kind support from partners, including:

- Allstate provided analytics support to a model predicting risk for elevators to prioritize those most needing inspection, work predicting which restaurants were most likely to fail their inspections, and a model to predict weather-related tree limb loss.
- Sagence Consulting provided analytics support for a fraud detection model used by the city.
- Other notable examples include a local web development firm that contributed support for user interface work; a firm that helped develop a model to predict business failures; a firm that explored a pothole response time optimization model; and a firm that contributed to data infrastructure for back-end data storage for analytics.

In addition, Chicago has made great use of civic tech volunteer help. The city's Chi Hack Night group contributed more than 200 volunteer hours to a project last year for a bacteria-detection beach closure model. Volunteers also helped test the user interface of their [OpenGrid](#) open-source analytics sharing platform.

In forming external partnerships, CDOs report that it is important to have a clear request. Just asking for help is not nearly as easy for an interested local corporate executive to respond to as a request for a specified number of hours of analytics work on a specific dataset or model.

DATA STEWARDSHIP AND ANALYTICS

The day-to-day work of moving a government toward greater ability to use data consists of data stewardship and data analytics. No two CDOs are alike, and not all have responsibility for both stewardship and analytics, but the two functions are interdependent and are addressed together here.

Data stewardship refers to the data infrastructure to manage data, and the data governance that guides data collection and quality, such as in an open data program. Data stewardship is perhaps the least discussed and yet one of the key inputs to a CDO's success, as it enables the analytics projects that build excitement and bring press attention.

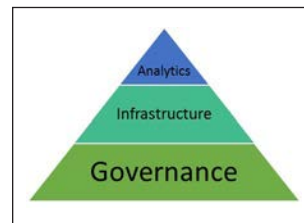
The term analytics is used widely and with many definitions. According to the Business Dictionary, analytics “involves studying past historical data to research potential trends, to analyze the effects of certain decisions or events, or to evaluate the performance of a given tool or scenario.” For purposes of this paper, analytics refers to the work of turning data into insight, whether through descriptive reports and mapping, or via predictive modeling.

CDO responsibilities vary widely, with some focused mostly on data stewardship and their open data programs, and others more focused on analytics. While not all CDOs have jurisdiction over data governance, all CDOs have an interest in data quality and availability.

Improving data quality and consistency allows it to be shared with the public in an open data program and also enables data analytics projects. Even with high-quality data, there can still be a great deal of work in cleaning and standardizing the data so that it can be used in analytics projects. Some CDOs say they spend two-thirds of their time getting data in a format that can be manipulated. Others estimate that as much as 95% of the effort on an analytics project is devoted to cleaning and organizing the data before it can be analyzed.

As shown below, a data analytics capability relies on a foundation of data infrastructure and data governance, the data stewardship tasks.

A foundation is laid with data governance, establishing the policies and standards by which government data is collected and managed, as well as the strategy for data collection and sharing (the what, why, and when). Upon that foundation, data infrastructure provides the mechanism for data to be collected and shared with the public on open data portals, as well as with other departments of government (the how). The result is both open data and internal data that can be used for mapping and descriptive or predictive analytics projects. The table below describes how these functions relate to one another.



Operational Framework for Enabling Data-Driven Government		
Responsibility	Questions Addressed	Description
Data Governance (Policy and Strategy)	Answers why, when, and what data is collected, generated, and shared within government and to the public	Setting standards for data quality, standards, and interoperability and determining how open data will be handled sets a solid foundation for data-driven decision making in government. Policies and standards should address data quality, consistency, frequency of updates, security, and accessibility. As discussed elsewhere , opening greater volumes of data can accelerate improvements in data quality. Strong data governance fosters interoperability and reuse of data across the enterprise. Data governance also addresses cross-agency sharing of who collects what, and for what purpose, to avoid duplication of data collection in different or competing formats.
Data Infrastructure (Services and Operations)	Answers how and where data is stored	Establishing the architecture of how data is stored and integrated across government can enable data-driven government by making data accessible. A range of formats are possible, from data warehouses to data lakes and data marts; regardless of the type, there must be a way to store and manipulate large volumes of data for data-driven government. Whether in traditional data centers or in the cloud, these systems must be monitored and maintained. Further, the provisioning of data in data warehouses enables more efficient data cleaning and normalization, steps that are critical inputs to any analytics project. Creating open data platforms allows data sharing with the public and across departments. Standardizing the processes internal to the CDO team for project management and execution further supports high-quality data infrastructure across the enterprise, and improves repeatability of solutions.
Data Analytics	Asks what is, why, and what if questions about the data	With large volumes of data available and with the tools for analytics, CDOs can look for patterns in their data and can gather insights that will improve service delivery to the public. Whether by mapping or developing descriptive statistics or predictive models, CDOs can advance the use of data to drive decisions by policymakers.

A good case study in the importance of data governance comes from Louisville, which hired its first Chief Data Officer in 2016. One of the motivating factors was to have someone responsible for data governance and enterprise-wide data management strategy. According to Theresa Reno-Weber, Louisville Chief of Performance & Technology, the initial open data work “really showed us the challenge of having multiple chefs in the kitchen—there needs to be one person who is really thinking strategically about data governance and using data as an asset both for us internally and for our public.”

The city has dramatically accelerated the use of data for decision-making in the last five years through the work of its Office of Performance Improvement and Innovation (OPI²) and its performance program, LouieStat. The city’s open data program has opened new channels to share data across government and with the public. In this process it became clear that the city needed a single point of responsibility for setting rules, policy and governance standards for the open data portal. Someone was needed to provide leadership and guidance to departments on what to release, when to release it, and how to release it, and to be the central point of contact for all of the data quality and data standards issues that arose as departments began sharing data. The new CDO will provide guidance to departments, to the IT organization responsible for hosting open data, and to the public.

ADVICE FROM THE FIELD

Standardizing both infrastructure and process makes it easier to scale CDO operations. Andrew Therriault, CDO in Boston, is standardizing the platforms and tools used by his Citywide Analytics Team, and to the degree possible the tools used in the departments as new IT procurements arise. He has also put in place a customer relationship management (CRM) tool for his department so that they can track the work they do for each city department, and can monitor progress of analytics projects in an optimized and standardized way. He says, “You don’t scale if you don’t standardize.”

In setting strategy, focus on important policy questions and key operational problems. Stephen Goldsmith, former Deputy Mayor of New York and a key driver of the move toward greater adoption of analytics in that city, warns against getting caught up in deep analytics that do not have power to make government better. He suggests avoiding the “data qua data” projects that can be attractive to data scientists for their mathematical complexity while failing to deliver results that are meaningful to the public.

MESSAGING TO AND ENGAGING DEPARTMENTS

Once a vision and roadmap and a team are in place, the CDO can begin engaging with departments. At this point, a written summary of the CDO’s charter is helpful as it will help make clear to departments what the team will and will not do. A one-page summary of the types of projects a CDO office will take on or an FAQ document might be helpful.

Engaging with Departments Across Government

A CDO can interact with other parts of government in a variety of ways. How a CDO chooses to engage with departments will depend on a variety of factors including how

ready the departments are to make use of their data and how open the department heads are to the involvement of an outsider in their work. The type of engagement will vary from developing data dashboards to creating sophisticated predictive analytics models. The level of engagement will vary by department, but the overall philosophy of engagement can be established by the CDO.

In the private sector, where CDOs have been in place for longer than in the public sector, experts have studied the engagement of CDOs and have described two basic models—centralized and decentralized.³

In cities, the centralized model retains analytics resources in a single team under the CDO’s leadership and provides services to departments, functioning as an internal consulting firm in support of the analytics needs of government departments. Some departments will have their own analytics resources, typically the better resourced or statistics-driven departments such as police, but the majority will rely on the centralized CDO team.

A centralized pool of analytics talent allows sharing of specialized skills across the enterprise from a common hub. Given that highly-trained analytics staff can be expensive for government, this is a judicious use of resources. Another benefit of a central pool of talent is the efficiencies gained via peer support and collaboration among team members. A centralized team is better able to standardize tools and processes across government, which can save time and money and help develop deeper expertise in the chosen methods. The team can also facilitate cross-departmental data initiatives due to its citywide view of available data. A downside to the centralized approach is that it slows the growth of sustainable analytics talent in the departments. Further, it can be difficult to achieve scale with a small, centralized team.

The decentralized model creates distributed capacity across government by embedding talent in departments. In the decentralized model, each department is responsible for developing its own analytics capability, which might range in expertise from budget and policy analysts who can complete basic descriptive statistics to analysts with the skill to perform data science tasks such as predictive analytics. One advantage to the decentralized model is that analysts develop subject matter expertise

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³ McKinsey, April 2016, The Need to Lead in Data and Analytics, <http://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/the-need-to-lead-in-data-and-analytics>

that makes them valuable to their departments. Departments have more control over their analytics resources.

Putting decision-making and control of analytics in the hands of department heads leads to uneven attention and results across departments, with some investing heavily and others giving it low priority. In government, a drawback to this approach is that unless compelled to do so, many departments may not appoint an analytics officer at all. For data-focused employees, a decentralized model has the downside of not working with peers, and having a more limited career ladder.

While the centralized and decentralized models present opposite ends of a spectrum, some organizations employ a blended or hybrid model that uses the best elements of the two basic models. The hybrid model has been found to be the most effective in the private sector.⁴ In government, most CDO offices follow the hybrid model.

Boston is a good example of a city that uses this model, neither fully centralized nor fully decentralized. The Citywide Analytics Team includes a variety of roles, from data scientists, data engineers, and GIS specialists to performance analysts. For some city departments, the team functions in a decentralized mode, supporting staff located in the department. Some, like the police department, have their own data analysts who can support day-to-day operations. For some departments, the team functions in a centralized manner, doing analytics work directly. For these efforts, the analytics team builds goodwill and relationships of trust with the department by solving tactical problems, which often means building a dashboard or map to meet a specific request of the department head.

One example is the Boston Fire Department, which relied heavily on the Citywide Analytics Team for help implementing a process to monitor how firefighters swap shifts—something that came under scrutiny after a series of negative reports in the press. At the time, the department didn't have the recordkeeping capacity, technology, tools, or analytic capability to make sure it was following the rules. The centralized analytics team stepped in and helped with this concrete task, which met an immediate need. This built their credibility and created a spirit of partnership, which has carried over to other analytics projects, such as the recent project that alerts firefighters to

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⁴ McKinsey, April 2016, The Need to Lead in Data and Analytics, <http://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/the-need-to-lead-in-data-and-analytics>

building hazards when they are en route to a call, bringing together seven separate datasets from across the city into a single visualization.

Identifying Analytics Projects from Departments

For a CDO, coming up with a structured way of engaging departments in analytics projects can be challenging. Many government CDOs are new to their jobs and have not yet developed their strategy for engaging with and soliciting project ideas from departments. Interesting models for gathering input from departments for possible analytics projects are found in Chicago, New Orleans, and New York City.

The City of Chicago received a grant to create an open-source predictive analytics platform, the SmartData Platform, as a winner of the Bloomberg Philanthropies Mayors Challenge. To generate predictive analytics ideas, or use cases, for the SmartData platform, Chicago developed a methodology to systematically reach out to agencies across the city to gather input and to identify the most powerful ways to use predictive analytics to improve city services to the public. The process includes the following steps:

Chicago's Use Case Identification Process	
Task	Description
Commissioner Interviews	The data team held one-on-one meetings with Commissioners for 10 city agencies to introduce the SmartData Platform and explain the potential for predictive analytics to make department operations more effective. The meetings built high-level stakeholder buy-in and identified 32 possible use cases for predictive analytics.
Use Case Development Workshops	Four cross-agency workshops invited brainstorming on ways to use predictive analytics to improve city response to public needs. Departments were clustered by topic area and then asked to come up with ideas that spanned their "silos" of operations. The facilitated cross-agency sessions identified 108 unique ideas that spanned a wide range of topics.
Follow-up Commissioner Meetings	In follow-up meetings, each of the Commissioners reviewed the possible use cases and weighed in on which were highest priority in making meaningful operational improvements. These meetings also filtered out ideas better suited to tactical fixes rather than big data analytics. A set of seven evaluation criteria were used to rank each idea, ranging from data availability to level of impact on the public. 20 ideas remained based on these filters.
Final Priority-Setting by the Mayor	The ultimate decision for which use cases were addressed and in which order factored in mayoral priorities and the most pressing civic needs of the people of the City of Chicago. The final filter for the ideas ranked them according to the existing evaluation criteria as well as the urgency of the issue and degree of public value that could be generated. With this final filter in place, the team had seven use cases to work on over the two-year period of the grant.

Now, nearly two years after establishing this list of top-priority use cases, Chicago is sufficiently confident in this process that they aim to repeat it soon.

New Orleans has recently created an annual process to identify analytics use cases. Beginning in summer 2016, the NOLAytics team, led by the CDO, developed a timeline for selecting analytics projects—they would solicit ideas in the fall, decide in early winter, and then have the year to execute on projects.

To generate interest and to advertise the availability of their analytics services to departments, they created a presentation to explain the power of data and the types of use cases they could take on. They shared this broadly across departments, with all senior managers, data analysts, and data coordinators across government.

They then hosted an open house to invite anyone interested in learning more to talk directly to the CDO and his team about possible analytics projects. The open house was valuable because departments that were not among the “usual suspects” for analytics work attended and developed ideas for new

ways to use data to improve operations. The analytics team created a simple application form departments can use to submit possible analytics projects, and a checklist that departments can use to assess whether their project is ready to be addressed via

ADVICE FROM THE FIELD

Get out into the field, so you can understand direct applications of technology: Laura Meixell, Analytics and Strategy Manager in Pittsburgh, says, “It’s important to go into the field to see and understand the direct applications of technology. Don’t take a department head or supervisor’s word about anything related to technology before you see it in the hands of the end user.”

Treat your departments as clients. San Francisco CDO Joy Bonaguro says, “Shaking your fist and indicting departments for data work won’t endear you to anyone. Instead, take the time to understand their perspective, their priorities, and their challenges and problems. Then help them identify ways data can help. We’ve done this both on a project level as well as for our broader plan.”

Build credibility and trust with departments one relationship at a time. One CDO recommends “paying your rent” by investing time in building relationships in departments and respecting the fact that while staff in a CDO office may be new to government, or new to their roles, the teams in departments may have staff with 20 to 30 years in government, and that longevity needs to be respected. Listening well and showing respect will have benefits as the trust allows the CDO team to help advance the use of data and learn from the expertise of departments.

Successful messaging builds demand—be ready. Many CDOs are struggling to prioritize incoming requests for assistance from departments. As the City of Chicago found, early on, when the office is new and few departments have heard of analytics, every request can be fulfilled. But as the analytics program becomes known for its successes in delivering operational improvement to the departments, it is harder to keep up with growing demand. As one CDO said, “be ready to say no” when there are more requests than available resources.

analytics. As 2016 is the first year of the new process, it will take time before the city can determine how well this works.

New York City has another model of engagement, where the Mayor’s Office of Data Analytics (MODA) serves as an internal analytics consulting firm for the city. Owing to its reputation for delivering results, MODA receives a steady flow of analytics requests. MODA does not have a formal channel for project intake, but instead takes a “no wrong door” approach.

The Chief Analytics Officer (Director of MODA) is responsible for liaising with leaders in the Mayor’s Office and across the city to understand how analytics can help their top-line priorities. Other members of the MODA team develop relationships with more mid-level personnel across the city who have more tactical insight because their daily work is closer to the actual data.

Once an idea is generated, projects are prioritized based on the following criteria:

- Potential for operational impact: How much of a difference is the project going to make? Will the change have a significant impact on operations? Is the agency clear about what it is looking for and how it will use the results?
- Sponsorship: How committed is the executive sponsor at the agency? How many resources are being committed to the project by the agency? How many resources in addition to MODA are on board? Will there be enough resources to make the project successful?
- Fit with MODA skills: Will the unique skills and tools that MODA has to offer provide leverage to make a difference in agency operations?

MODA only takes on projects that meet some or all of these criteria. This screening method improves organizational buy-in for projects, which increases the chances that analytical models built by MODA analysts will make it to an operational pilot stage, and eventually be integrated sustainably into an agency’s operational workflows.

There are many ways to engage with departments, but one lesson that came up repeatedly was the value of relationship building and deep listening.

FOSTERING A CULTURE OF DATA-DRIVEN GOVERNMENT

The impact of a CDO can be significant and lasting—they have the power to foster a culture of data use across government and create distributed capacity. In moving their government toward data-driven decision-making, the CDO faces the classic tradeoff between doing the work for departments or “teaching them to fish.” In many cases, the CDO has no choice but to build distributed capacity.

Tyler Kleykamp, CDO for the State of Connecticut, is not alone among CDOs in having a staff of one. The executive order that created his office also created data coordinators in each executive-branch agency. His engagement method is to provide the platform and tools along with training so that the data coordinators can publish and use data within their department as well as across government. And he’s having an impact—by facilitating the release of both state public health drug overdose data and local crime data for drug offenses, he has enabled analytics both across departments and outside state government. Mapping has shown that overdoses might not occur at the same addresses as drug sales, but they are typically close by. Public use of and feedback about the data identified irregularities in the data that have resulted in quality improvements, and fueled a week-long series on addiction by a local interest group. The impact of this open data is not just local, with users as far away as an opioid overdose hackathon event in D.C.

Santa Monica, CA, has made major advances in achieving a “culture of data” even before hiring their first CDO, which the city plans to do in early 2017. The city’s data-intensive [Wellbeing Index](#) has already created important shifts in culture and use of data. The project, which won the 2013 Bloomberg Philanthropies Mayors Challenge, aims to measure the degree to which people are thriving, and allow government to foster community and individual wellbeing. The Wellbeing Index team has held workshops on how to use data to inform policy, and has created open incubator sessions where teams are armed with data from the Wellbeing Index and asked to devise solutions to improve wellbeing gaps identified by the data. When the city hires its first CDO, the momentum on creating a culture of data-driven decision-making will already be well underway.

One of the best examples of creating culture change and building capacity across government comes from San Francisco, where the CDO’s office in partnership with

the Controller’s office offers training to city and county staff on a variety of data skills through the SF [Data Academy](#). Their goal is to allow city staff to “[explore, refine, and enhance their skills in data analysis and visualization](#).” A variety of courses are offered on a regular basis, and customized courses can also be delivered to a department.

Courses include both classroom-based learning and online courses, designed to be accessible to a broad audience. Topics include skills such as business process mapping and specific tools such as Excel and Tableau. In addition to offering instructor-led classes, the SF Data Academy curated a list of online content covering a wide range of skills and tools that city staff can access. This model is now being emulated in Connecticut and San Diego, and has already been adapted and deployed by New Orleans.

The Pittsburgh CDO has responsibility for the city’s Lean Six Sigma process improvement project and is building capacity not just for data-driven government, but for innovation in general. The CDO team is active in supporting innovation across the city, including playing a part in the city’s application for the U.S. Department of Transportation’s Smart Cities Challenge grant competition.

Chicago builds citywide capacity by connecting to its broad civic tech community, which consists of thousands of data and policy enthusiasts who volunteer to advance the public good with technology. Its CDO participates in several regularly-held civic tech meet-ups and events, including Chi [Hack Night](#), one of the city’s largest civic tech volunteer groups. To spread data culture within city government, the CDO also holds training sessions on analytics, and has created a [tutorial video](#) on how to use Open-Grid, the city’s new open-source analytics and data visualization tool.

In Los Angeles, the CDO held open workshops for public servants in city departments to help them learn to use the new GeoHub data visualization tool. The [series of workshops](#) kicked off with one session that included representatives from over 20 city agencies. The goal of the workshops is to increase skills in data analysis and visualization, as well as to inspire more inter-agency conversation about the value of data in government operations. Los Angeles recently formalized its inventory efforts by convening 55 data coordinators from over 30 departments to provide uniform data standards and improve the city’s open data libraries on the GeoHub and its open data portal.

In New York City, the Mayor’s Office of Data Analytics partnered with the Department of Citywide Administrative Services (DCAS) to develop courses that train

employees across the city on data analytics tools. They also developed a course for managers on how to lead their units in a more data-driven way.

Hiring a CDO offers a unique opportunity to advance data capacity across the enterprise. Regardless of the model they choose, a CDO has to build capacity in departments to have an impact across government.

CONCLUSION

CDOs in government are in a position to make a lasting difference in the lives of the public. One concrete example is reducing fire deaths. CDOs in Boston, New Orleans, and New York City have saved lives that might have been lost to fires.

- In Boston, firefighters are equipped with data-powered protection from hazards, with a fully-integrated dashboard map of all hazard data in the city keeping them protected while en route to fight fires. Begun as a project of a fire dispatcher, the Citywide Analytics Team developed a visualization tool that integrates location-based information across seven databases showing where fire hydrants, biological and industrial hazards, and code violations are so that firefighters make it quickly and safely to their destinations.
- New Orleans gets people out of burning buildings with strategic placement of smoke alarms to save lives, particularly among vulnerable populations. In response to a tragic loss of life, the fire chief asked the CDO for help prioritizing where to install smoke alarms in its free distribution program. Using varied data from city and national sources, the CDO team identified homes most at risk of fire and least likely to have smoke alarms. The result—in just one recent example, 11 people, including a baby, were saved from a burning building because of the alarm they got through this data-driven program.
- NYC building inspectors prevent fires by prioritizing inspections at the riskiest addresses. The Mayor’s Office of Data Analytics used address level data to identify buildings that were a high risk for illegal conversion from single family into subdivided multi-family units, which is a fire hazard as families cook

on hotplates instead of in kitchens, and may not have appropriate forms of egress. Using compliance data from the city’s 311 system, property tax payment data from the city’s Department of Finance, and foreclosure data from the Office of Court Administration, the Department of Buildings was able to get building inspectors to the highest-risk properties first.

With these and other visible successes, CDOs are becoming culture change agents in moving their governments toward data-driven decision making.

CDOs can also be pioneers in breaking down silos—for example, the work of the Los Angeles CDO to create the GeoHub inspired cross-departmental sharing of road closure data; now, fire trucks get to their destinations faster by avoiding roads that are closed due to construction.

CDOs can be data evangelists—by going to conferences, hackathons, and other events, CDOs can bring more attention to the data resources available to the public and can improve quality by shining the light on government data and analytics work.

Analytics officers at private-sector companies make money by analyzing our data and presenting it to us in ways that make it easy for us to spend money with just one click. A government CDO can do something much more powerful than suggest a purchase—they can analyze the data and present it in a way that lets a government decision-maker see new insights and make better decisions, creating greater public value. In government, CDOs are powering decisions about resource allocation to improve pedestrian safety, create more responsive and efficient transit routes, reduce opioid overdoses, and more accurately predict when beaches should be closed due to unsafe water.

Today, data is plentiful but insight is far less common. The volume of data produced by state and local government is significant—Chicago alone produces seven million rows of data every day, from police reports to information about schools, libraries, and public parks. Analytics gives us a way to sift through the data and find insight and knowledge that can lead us to action. There is ample opportunity to use data for the common good—what an exciting time to be a CDO in government.

CIVIC ANALYTICS NETWORK MEMBERS—QUICK FACTS

The table below includes summary information for the participants in the Civic Analytics Network as of December 2016.

City	Name	Title	Reports to	Year Position Created	# Staff
Allegheny County, PA	Erin Dalton	Deputy Director, Data Analysis, Research, and Evaluation	Department of Human Services Director	2007	40
Boston, MA	Andrew Therriault	Chief Data Officer	Chief Information Officer	2016	22
Chicago, IL	Tom Schenk	Chief Data Officer, Department of Innovation and Technology	Chief Information Officer	2011	13
Cincinnati, OH	Brandon Crowley	Chief Data Officer	Chief Performance Officer	2014	1
Denver, CO	Scott Cardenas	Chief Information Officer	CDO function is divided among Chief of Staff, CIO, and City Attorney	N/A	N/A
Kansas City, KS	Alan Howze	Chief Knowledge Officer	Assistant County Administrator	2016	5
Los Angeles, CA	Lillian P. Coral	Chief Data Officer, Director of Mayor's Data Team	Deputy Mayor - Office of Budget and Innovation	2013	4
Louisville, KY	Michael Schnuerle	Data Officer, Performance Improvement and Innovation	Chief of Civic Innovation	2016	2
Minneapolis, MN	Eero M. Kilkson	Director of Business Intelligence and Data Services	Chief Information Officer	2015	5
New Orleans, LA	Oliver Wise	Director, Office of Performance and Accountability	1st Deputy Mayor, New Orleans Chief Administrative Officer	2010	6

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LESSONS FROM LEADING CDOs: A Framework for Better Civic Analytics

City	Name	Title	Reports to	Year Position Created	# Staff
New York, NY	Amen Ra Mashariki	Chief Analytics Officer, Director of Mayor's Office of Data Analytics	Director of Operations	2013	8
Philadelphia, PA	Tim Wisniewski	Chief Data Officer	Chief Administrative Officer	2012	10
Pittsburgh, PA	Laura Meixell	Analytics and Strategy Manager, Department of Innovation and Performance	Chief Innovation & Performance Officer	2014	4
San Diego, CA	Maksim Pecherskiy	Chief Data Officer, Performance & Analytics Department	Director of Performance and Analytics	2014	2
San Francisco, CA	Joy Bonaguro	Chief Data Officer	Mayor	2013	7
San Jose, CA	Erica Garaffo	Data Analytics Lead, Office of Civic Innovation and Digital Strategy	Deputy City Manager, Office of Civic Innovation and Digital Strategy	2016	4
Seattle, WA	Leah Tivoli	Organizational Performance Manager	Organizational Performance Director	2016	1
South Bend, IN	Santiago Garces	Chief Innovation Officer	Mayor	2014	25
Washington, D.C.	Barney Krucoff	Chief Data Officer, Office of the Chief Technology Officer	Chief Technology Officer	2016	19

PROFILES OF SELECTED CAN MEMBERS

As has been described in the preceding pages, there is no one single way to structure an urban analytics organization, nor is there one common set of duties or priorities across organizations. To demonstrate the range of responsibilities and achievements of CDOs, brief profiles of selected analytics teams were created. The CDOs who formed the informal network (now funded by the Laura and John Arnold Foundation and expanded) received funding to support fellows in their cities. These fellows are responsible for documenting and sharing successes from their cities, and contributed the profiles in the pages that follow. Selected other cities volunteered their time and attention so that their cities could be profiled as well. The profiles that follow are intended to assist a new CDO in understanding the diversity of possible organizational and policy priorities.

CHICAGO PROFILE

<p>FAST FACTS:</p> <ul style="list-style-type: none"> • Leader: Tom Schenk, Chief Data Officer • Reports to: Chief Information Officer • Year established: 2011, via executive order from the Mayor • # on team: 13 	<p>BIO:</p> <p>Tom Schenk is a researcher, author, and an expert in a number of fields, including open government, data visualization, business and research and policy in education. He leads the City of Chicago’s efforts to use data analytics to improve operations and services. He has previously served as a consultant for Institutional Effectiveness and Accountability at the Iowa Department of Education, where he led efforts to use student-level longitudinal data to evaluate education programs. He earned a Master’s degree in economics from Iowa State University and a Bachelor’s from Drake University.</p>
<p>KEY FOCUS AREAS:</p> <ul style="list-style-type: none"> • Manages open data program and portal operations • Oversees the city’s database management, business intelligence, and data visualization platforms • Oversees advanced analytics unit, which includes piloting, launching, and operationalizing projects as well as engaging in relevant partnerships 	
<p>RECENT/NOTABLE PROJECTS:</p> <ul style="list-style-type: none"> • OpenGrid: OpenGrid, designed by Schenk’s team and a host of local partners, serves as a geographic information system that presents a unified view of city data, past and present, across a map of Chicago. OpenGrid gives residents the ability to visualize and understand city data to a level far beyond the current data portal, greatly enhancing transparency efforts between the city and public. As an open-source technology, OpenGrid is also a model for cities across the country to replicate as an alternative to standard data portals. • SmartData Platform: Chicago’s SmartData Platform, currently in development, is the country’s first municipal open-source predictive analytics platform, that will analyze millions of lines of data in real time to help leaders make smarter, faster decisions to help address and prevent problems before they develop. The platform is a winning project for the 2013 Mayors Challenge, a Bloomberg Philanthropies competition to develop solutions to major urban challenges. • Food Inspection Analytics: Schenk’s Department of Innovation and Technology team and the Department of Public Health partnered with an Allstate Insurance pro-bono team to develop an analytics-based procedure to enhance food inspections processes. By doing this, Chicago was able to discover critical violations, on average, seven days earlier than with the traditional inspection procedure. 	

BACKGROUND AND DESCRIPTION OF OPERATIONS:

Chicago's Chief Data Officer Position was first created in 2011, during Mayor Rahm Emanuel's first year in office. The position, held by former OpenTable startup pioneer and police officer Brett Goldstein, began as a role held within the Mayor's Office that reported directly to the Mayor. Goldstein's major accomplishment during this era was the development of WindyGrid, a map-based situational awareness tool built entirely in-house. WindyGrid was successfully piloted as an interoperability tool for city departments to manage the 2012 NATO Summit, held in Chicago.

In 2012, the position was strategically moved to the Department of Innovation and Technology (DoIT), where Goldstein retained the CDO title while also becoming DoIT's Commissioner and CIO for the City. This move was done to (1) help shield the CDO's work from the political demands of the Mayor's Office, (2) help ensure the position's long-term sustainability within an operational department, and (3) relocate it in an IT environment that would be most relevant for enabling the successful deployment of various data and IT projects.

In 2014, following Goldstein's departure from the City of Chicago, Tom Schenk was appointed Chief Data Officer, a role in which he currently serves. Schenk is the first Chief Data Officer of the City of Chicago who began his tenure within the Department of Innovation and Technology. Rather than reporting to the Mayor, Schenk reports to DoIT's Commissioner and Chief Information Officer of the City, Brenna Berman.

At DoIT, Schenk oversees a team of 13 people, which includes one data scientist, one open data program manager, two business intelligence analysts, and nine database analysts. This gives Schenk a larger team and operational edge that is unique to Chicago, as he does not have to coordinate with a separate department to access the city's database management team.

Throughout his tenure, Schenk has focused heavily on expanding what is available on Chicago's data portal, one of the oldest and most robust in the nation. Chicago's open data portal provides user-friendly access to 600+ datasets (and growing), allowing the public to browse data in a spreadsheet-like format and create maps and graphs. Sample datasets include all Chicago crimes from 2001-present, energy usage by census block, and all city budget appropriations. Recent data posted includes Chicago Department of Transportation permits and the "problem landlord list," which highlights property managers with multiple violations and has been one of the city's most viewed lists. Datasets including 311 information, parking terminals, building ordinance violations, and data on Chicago's popular bike-sharing program, Divvy, have all been either recently released or are being prepared for release.

Schenk has also been one of the nation's preeminent CDO advocates of open-source tools and technologies. Major initiatives such as OpenGrid and the SmartData Platform have been developed open-source not only as a cost-effective strategy, but to enable collaboration and replication by other cities across the city and the world.

Schenk's team has also worked to modernize the city's database management systems. In the past year, the team has consolidated database licensing to minimize annual costs. Of \$3 million in annual fees, the database administration team reduced annual fees by \$600,000 per year, a 20% reduction in costs.

LOS ANGELES PROFILE

<p>FAST FACTS:</p> <ul style="list-style-type: none"> • Leader: Lilian Coral, Chief Data Officer, Director of Mayor’s Data Team • Reports to: Deputy Mayor, Office of Budget and Innovation • Year established: The Data Team was established by Mayor Garcetti’s Executive Directive 3 passed in 2013; first CDO was appointed in 2014 • Team name: Mayor’s Data Team • # on team: 4 	<p>BIO:</p> <p>Lilian Coral joined the Office of Mayor Eric Garcetti after 15 years working on a wide range of health and human services issues as an advocate and executive leader. Having worked with labor unions, NGOs, foundations, and human service agencies at all levels of government, she applies her experience to re-thinking the way government uses data and technology to serve its citizens. Most recently, as the founding Director of 2–1–1 California, she led a network of 26 non-governmental organizations, available to over 33 million Californians. Ms. Coral holds a master’s degree in public policy from UCLA and is a native of Colombia, from where much of her inspiration for innovation and social justice emerged.</p>
<p>KEY FOCUS AREAS:</p> <ul style="list-style-type: none"> • Open Data: publish and maintain quality, up-to-date city data that can be used by public and private partners to develop insights to the city’s most pressing challenges, and useful and innovative digital solutions for Angelenos • Analytics: use best-in-class analytics to tackle mayoral priorities and advance citywide capabilities in data analytics • Digital Services: advance user-centered design in development of all city digital services 	
<p>RECENT/NOTABLE PROJECTS:</p> <ul style="list-style-type: none"> • GeoHub: The map-based portal powered by Esri serves as a foundation to do the work of making smarter cities: It pulls data from many different places and weaves together various perspectives to create the most compelling maps and apps. • CleanStat: CleanStat is the nation’s most comprehensive street cleanliness assessment that provides quarterly, block-by-block data to identify trends in street cleanliness. As part of Mayor Eric Garcetti’s <u>Clean Streets initiative</u>, the City’s Bureau of Sanitation travels over 22,000 miles and gives each block a cleanliness score from 1–3. Using the GeoHub, users can type in their address to learn more about how their streets scored. • Vision Zero: Vision Zero data links demographics, the built environment, and health outcomes, serving as a tool to inform transportation safety planning and policy in Los Angeles. • Mayor’s Dashboard: A dynamic performance tool used to improve delivery of quality customer services to every resident in Los Angeles and produce the most livable, prosperous, well run and safe City that Angelenos deserve. 	
<p>BACKGROUND AND DESCRIPTION OF OPERATIONS:</p> <p>The Mayor’s Data Team is responsible for supporting Mayor Garcetti’s data-driven government by managing the city’s open data assets; producing performance dashboards to review the city’s progress through data; assisting departments in automating their open data; and leading analytics projects with internal and external partners in the city, academia, and the civic tech community.</p>	

NEW ORLEANS PROFILE

<p>FAST FACTS:</p> <ul style="list-style-type: none"> • Leader: Oliver Wise, Director, Office of Performance and Accountability • Reports to: 1st Deputy Mayor, New Orleans Chief Administrative Officer • Year established: Wise joined New Orleans in 2010 • Team name: NOLALytics • # on team: 6 	<p>BIO:</p> <p>Oliver Wise is the founding director of the City of New Orleans’ Office of Performance and Accountability (OPA), the city’s first data analytics and performance management team. Launched in 2011 by Mayor Landrieu, OPA leverages data to set goals, track performance, and get results across government. Oliver’s work has been recognized with a Certificate of Excellence by the International City Managers Association, an Innovation Award from the Bureau of Governmental Research and a Bright Idea award from the Harvard University Ash Center for Democratic Governance and Innovation. He was also named to Government Technology’s “Top 25 Doers, Dreamers, and Drivers” list for 2015. He holds an M.P.A. from NYU’s Robert F. Wagner Graduate School of Public Service and a B.A. from Tufts University.</p>
<p>KEY FOCUS AREAS:</p> <ul style="list-style-type: none"> • Performance and stat programs • Analytics 	
<p>RECENT/NOTABLE PROJECTS:</p> <ul style="list-style-type: none"> • BlightSTAT: Using a stat process and leveraging address-level data across five agencies, New Orleans reduced blight by over 15,000 units. Inspection time dropped from 160 days to 80 days. The city also created an app so the public can submit photos with facts on properties in decline, preventing blight through civic engagement. • Smoke Signals: Last year analytics literally saved 11 lives (including a baby) because they left a burning building when their smoke alarm went off. The family had been given a free smoke alarm in a new data-driven distribution program. A tragic loss of life inspired the fire chief to seek Wise’s help in improving its smoke alarm program. Wise’s team used analytics to do two things—predict which homes were most likely to have a fire, and predict which homes most likely lacked smoke detectors. Those two predictions pinpointed where the fire department could <u>prioritize distribution</u> of alarms, block by block. • Datadriven.NOLA.gov: The city recently launched a site that integrates the work of its open data, stat, analytics, and GIS efforts, combining in one place nearly all data-driven efforts. This single hub provides all products and apps in a “one stop shop” for data-driven government. At this site is an explanation in plain English of what the analytics program can do for departments and the <u>types of government problems</u> that can be addressed with analytics, along with an explanation of how to <u>apply</u> to be one of the three to five projects NOLALytics takes on in 2017. Links allow the user to drill down for <u>more detail</u> on the types of analytics projects that NOLALytics can execute. The team held an open house and is doing outreach meetings to proactively educate departments about analytics and to identify specific applications. This intentionality in identifying new opportunities is a strong statement about the maturity of the organization—they have moved from startup mode to fully operational. 	

BACKGROUND AND DESCRIPTION OF OPERATIONS:

Oliver Wise, hailed by Bloomberg.com as “the best of data science use in government innovation today,” leads the New Orleans Office of Performance and Accountability. Established by Mayor Landrieu in 2010 to set goals, track progress and measure results, Wise’s office runs weekly performance stat meetings that cover topic areas such as blight elimination, customer service, quality of life, and contracting. Results are shared publicly at [Results NOLA](http://Results.NOLA).

Three years after launching the stat program, Wise found that early impressive gains had started to level off. At that same time, he learned of the work of Mike Flowers, (then) Chief Analytics Officer in New York City working for Mayor Bloomberg. What inspired Wise about Flowers’ work was how it became a game-changing operational tool for departments, helping to improve progress by using data.

This inspiration led to the creation of an analytics program, NOLALytics, within the Office of Performance and Accountability. Describing how the stat and analytics roles complement each other, Wise says, “Our job is about the use of data.” His team runs city stat meetings, so they understand the operational issues of city departments, many of which can be addressed through analytics. Analytics projects can be sourced via the stat process, by mayoral request, or as a request from a commissioner in a department.

Once a project is agreed upon, one person on the staff manages the process of defining and scoping the project. This person does the due diligence—what the project is, what the deliverable will be, what the data is, data availability, and the questions in the project. Then Wise matches the resources available to the project, often finding external pro bono partners to help.

Wise has been successful in finding outside partners to work either on a pro bono or highly discounted basis. Louisiana State University (LSU) is contributing pro-bono support to current research projects, using open-source software to examine historical 911 calls and traffic conditions to identify the optimal posting locations for ambulances, so they can cover the most area of the city within an acceptable response time threshold.

ADVICE TO A NEW CDO:

- Start with problems and then come up with ideas where analytics can be brought to bear. He advises against starting with a technology tool or approach rather than with the question. He has also devised a methodology for making sure the question is carefully articulated before the project begins, creating what he calls “use case truffle pigs” who can assess the project for its appropriateness for analytics, exploring, for example, if there can be an actionable insight at the end.
- Wise focuses on the “minimum viable product” rather than a result that must be perfected to be used. As he says, “Don’t let the perfect be the enemy of the good.”
- He is practical and action-oriented and his advice to a new CDO is to not be afraid to try something. As he found with an A-B testing project for various nudges, if something doesn’t work, you learn what you can and go onto the next thing.
- Roadblocks are part of the process and teamwork can be part of the solution. During the smoke alarm project, initial attempts to analyze building permit data dead-ended over major data quality problems. The team considered doing a survey to figure out which buildings had smoke alarms, but realized having firefighters go door-to-door was not only expensive, it was also impractical. Then, a “[breakthrough idea happened by chance](#)” when a team member working on another project found that the U.S. Census Bureau’s [American Housing Survey](#) (AHS) gathers data on smoke alarms. This discovery would not have happened without a shared investment in the team’s results—knowing what teammates are working on and where they are finding difficulty is the first step in helping them find the right data.

NEW YORK CITY PROFILE

<p>FAST FACTS:</p> <ul style="list-style-type: none"> • Leader: Amen Ra Mashariki, Chief Analytics Officer, Director of Mayor’s Office of Data Analytics • Reports to: Director of Operations • Year established: MODA was established by NYC Executive Order 306 in 2013 • Team name: Mayor’s Office of Data Analytics (MODA) • # on team: 8 	<p>BIO:</p> <p>Dr. Amen Ra Mashariki, Chief Analytics Officer for the City of New York, is an accomplished leader within government, academia, and the private sector. He started his professional career as a software engineer at Motorola working on over-the-air data transmission projects and led a team of user-interface developers to build components of security features for handheld devices. Prior to his work in New York City, Dr. Mashariki served as Chief Technology Officer at the U.S. Office of Personnel Management. Dr. Mashariki holds a Doctor of Engineering from Morgan State University, a Master of Science in Computer Science from Howard University, and a Bachelor of Science in Computer Science from Lincoln University. He is a Brooklyn native and attended Brooklyn Tech High School.</p>
<p>KEY FOCUS AREAS:</p> <ul style="list-style-type: none"> • Collaborating with city agencies to implement data-driven solutions on analytics projects • Building citywide platforms for data sharing • Implementing the city’s Open Data Law 	
<p>RECENT/NOTABLE PROJECTS:</p> <ul style="list-style-type: none"> • Open Data for All: New York’s open data strategy commits to making datasets released through the Open Data Portal more accessible, useful, and user-friendly for all New Yorkers, not just the tech-savvy. • Data Drills: In partnership with Office of Emergency Management, MODA convenes data owners from city agencies to simulate how NYC’s data assets are mobilized and integrated during an emergency situation. The first Data Drill in 2016 brought together a range of agencies with varying levels of data maturity. Subsequent drills included agencies that have existing data analytics capacities in order to fully leverage the citywide focus and skillset of the MODA team. “Hotwashes” following the drill provide an opportunity to examine pain points in the coordination of multiple data workflows in order to plan improvements and develop “muscle memory” for more agile responses. • Targeted Enforcement: MODA analysts have built several predictive models that allow for the prioritization of inspections resources for illegal housing practices, including tenant harassment, source-of-income discrimination, and illegal conversions of apartments. MODA is working with the NYC Commission on Human Rights to develop a model predicting where landlords are most likely to illegally reject affordable housing vouchers. A partnership with the Tenant Harassment Task Force (THTF) uses NYC data to drive the prioritization of Task Force inspections by identifying trends and relationships from past cases of harassment. • Buildings Intelligence Toolkit: MODA developed a Buildings Intelligence Toolkit, an application that reconciles and visualizes buildings data from multiple agencies according to common Building Identification Numbers (BINs). • End-to-End: MODA works with agencies to create end-to-end measurements that track the effectiveness of a given business process from start to finish. These metrics help inform future policy decisions. Past partnerships include work with FDNY and NYPD to chart the lifetime of a 911 call from dial-in to ground response, and with the Small Business Services (SBS) to sum the amount of time it takes (and bottlenecks along the way) for New York entrepreneurs to open new businesses. 	

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LESSONS FROM LEADING CDOs: A Framework for Better Civic Analytics

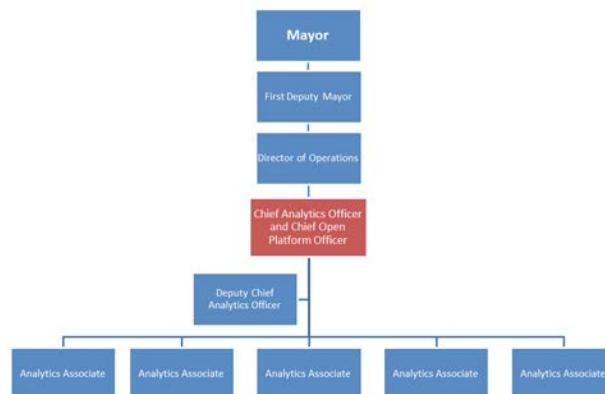
BACKGROUND AND DESCRIPTION OF OPERATIONS:

The Mayor’s Office of Data Analytics is the city’s civic intelligence center, leveraging administrative, open, and private data for actionable insights. As part of the Mayor’s Office of Operations, MODA provides NYC a unique set of capabilities as an ideas incubator for applied operational analytics. Before it was formally coined “MODA,” it was a small team investigating financial crimes in the Mayor’s Office of Criminal Justice. A few key ingredients—executive support, early use cases in inspections, and a message well-fit to a swelling nationwide interest in data-driven government—led to MODA’s official institutionalization by then-Mayor Bloomberg in a 2013 executive order. In 2014, in a new administration and under direction of a new Chief Analytics Officer, MODA shifted to a broader vision for citywide data analytics—*analytics-in-motion*—aligning Mayor de Blasio’s progressive agenda with growing analytics capabilities throughout city government. Open data became *Open Data for All*, analytics pilots unfolded into a wider analytics culture within partner agencies, and one-off responses to citywide emergencies grew into a strategy for managing the uncertainty in disaster management. MODA, which began as a niche innovation wedged between existing functions in the city, is now advancing the city’s data strategy through the Citywide Intelligence Hub, a nexus of technology, analytics tools, trainings, and data sharing protocol that help the city prepare for the “unknown unknowns” of responsive analytics-in-motion.

ADVICE TO A NEW CDO:

- **Enabling Analysts:** “The soul of MODA is the analyst. My philosophy of leadership is to always hire people who are smarter than me. I hire people based less on how well they match a profile of technical skills, more on whether they are curious and aggressive analytical thinkers. As the Chief Analytics Officer for the City of New York, I spend my time getting obstacles out of the way so that my analysts can drive forward on the meaty analytics work in the City.”
- **Direct Engagement with the Implementing Agency or Office:** “Our successful projects always contain many conversations with the implementing agency on the problems they face, as well as the opportunities they would like to investigate. By engaging with the interested parties directly, we avoid telephone situations about priorities, operational details, and timelines.”

ORGANIZATIONAL CHART:



PITTSBURGH PROFILE

<p>FAST FACTS:</p> <ul style="list-style-type: none"> • Leader: Laura Meixell, Analytics and Strategy Manager • Reports to: Chief Innovation & Performance Officer • Year established: The Analytics & Strategy Manager role, within the Department of Innovation & Performance, was established in January 2014. • Team name: Analytics & Strategy Team • # on team: 4 	<p>BIO:</p> <p>As Analytics and Strategy Manager for the City of Pittsburgh, Laura Meixell leads the City’s open data and data-driven decision-making efforts. She previously served as a Code for America Fellow, and was a Presidential Management Fellow placed with HUD’s Office of Strategic Planning and Management to manage the department’s data driven performance management program (HUDStat). She started her career in Pittsburgh, working on the Pittsburgh Neighborhood and Community Information System as a GIS Research Assistant.</p>
<p>KEY FOCUS AREAS:</p> <ul style="list-style-type: none"> • Building business intelligence (BI) applications for city departments • Working with the Western Pennsylvania Regional Data Center to provide open data • Assisting city departments with data driven decision-making and performance management • Supporting the city’s help desk (IT) team on performance improvement 	
<p>RECENT/NOTABLE PROJECTS:</p> <ul style="list-style-type: none"> • Open Data: Served as lead partner with the County and University of Pittsburgh on the Western Pennsylvania Regional Data Center (WPRDC), working to publish city datasets. • Burgh’s iView: Built versions of Burgh’s iView, a web mapping application, for the city’s Police, Fire, and Permits/Licensing departments, as well as for City Council and 311 (non-emergency requests and complaints submitted by the public). A public version of Burgh’s iView, which incorporates elements of each internal vision, is forthcoming. • CityStat: The team is preparing to use real-time and backlogged 311 information to look at the state of city services, and to provide city employees with a more holistic understanding of how their departments are responding to citizen requests. • Snowplow Tracker: Built and launched a GPS-enabled application to enable the public to track city snowplows in real time. • IT Help Desk Reform: Working to improve performance and responsiveness of the city’s help desk and IT service management by improving how the software is structured. A recent upgrade has provided the ability to link service tickets to devices, for example. • Hardware Acquisition Optimization: Conducted a major review of the process for hardware acquisition, and implemented process improvements. 	

BACKGROUND AND DESCRIPTION OF OPERATIONS:

Both the Analytics and Strategy team, and the department in which it resides (Innovation & Performance), were created in January 2014 during Mayor William Peduto’s first month in office. Previously, there was no position responsible for data management. In fact, prior to the hiring of Analytics and Strategy Manager Laura Meixell, the city had not held a cross-departmental performance stat meeting since 2006. Data work had substantially ceased during the prior administration.

Meixell’s first task was to craft the city’s open data policy, and to work with the Mayor’s Office and Council to ensure the legislation’s approval. Initially, Meixell assumed she would begin with a data inventory, and build specific field definitions for existing and future databases, modeled after Chicago’s approach. However, she soon discovered that neither an inventory of systems, nor a list of software (including who managed the software and its use) existed. The lack of documentation was an early indicator that her position would encompass more IT management than she had originally thought.

In the first six months, Meixell worked without a team. For the rest of the first year, her team consisted of two interns and a fellow provided by a local civic leadership organization. Together, the team conducted a systems inventory through internal interviews with city departments and their respective employees. Concurrently, the team worked with a team at the University of Pittsburgh to solicit dataset requests from the public and regional stakeholders—requests that would later provide a roadmap for open datasets on the regional open data portal. Meixell collaborated with university and county partners on an initial request to area foundations, which funded both the WPRDC and a Code for America (CFA) team to update the city’s procurement process. Meixell managed the CFA team throughout 2015.

While project prioritization in the first two years was largely ad hoc or in response to pressing business needs (there has been no guiding strategic plan), the completion of the systems inventory and hiring of analysts has allowed the team to more proactively address business needs of city departments. Moving away from the early days of cross-departmental partnership building, which Meixell refers to as a “coalition of the willing,” the team’s strategy in working with departments has been to build an initial business intelligence application as an entrée to a longer-term relationship.

ADVICE TO A NEW CDO:

- **Understand Direct Applications of Technology:** “It’s important to go into the field and see and understand the direct applications of technology. Don’t take a department head or supervisor’s word about anything related to technology before you see it in the hands of the end user.”
- **Consider Trade-Offs in Dealing with Management:** “Individuals in the CDO role can sometimes have adverse interactions with management, as their work pushes boundaries and seeks to raise the level of city performance. Be careful to ensure that others see you as part of the city’s ‘team.’ Don’t always push. This is going to be important for cultivating, in the long-term, a community of practice in your city.”

ORGANIZATIONAL CHART:



SAN FRANCISCO PROFILE

<p>FAST FACTS:</p> <ul style="list-style-type: none"> • Leader: Joy Bonaguro, Chief Data Officer • Reports to: Mayor, via chief of staff • Year established: DataSF was established in 2009; CDO role created in 2013 and position filled in 2014 • Team name: DataSF • # on team: 7 (as of December 2016) 	<p>BIO:</p> <p>Joy Bonaguro is the first Chief Data Officer for the City and County of San Francisco, where she manages DataSF. Joy has spent more than a decade working at the nexus of public policy, data, and technology. She worked from the birth of the open data and open government field, spending seven years designing and managing development of systems to support planning and decision-making at the Greater New Orleans Community Data Center. Prior to that, she worked at Lawrence Berkeley National Laboratory to help develop technology, cyber, and privacy policy working with the National Lab CIO Council and the Department of Energy Information Management Advisory Group. Joy earned her Masters from UC Berkeley’s Goldman School of Public Policy, where she focused on IT policy.</p>
<p>KEY FOCUS AREAS:</p> <p>The current strategic plan lists seven goals:</p> <ul style="list-style-type: none"> • Make timely data easily available • Improve the usability, quality, and consistency of data • Increase use of data in decision-making • Promote efficient and effective data governance • Foster innovations in data • Improve communications and storytelling • Continuously improve, scale, maintain, and monitor our work 	
<p>RECENT/NOTABLE PROJECTS:</p> <ul style="list-style-type: none"> • Established Center to Improve Confidential Data Sharing: Building out the governance, policies and procedures, and infrastructure to improve cross-departmental and jurisdictional data sharing, collectively called ShareSF. These efforts will promote improved planning and coordinated care. • Overhauled Open Data Publishing: City open data legislation requires publishing plans and reports from departments. Established a lightweight process and a platform called DataSF and are in the process of tracking status and progress and reporting it transparently. In Fiscal Year 2015, published 49 datasets and in FY 2016, published 133 (a 171% increase). • Query Tool Saves Time for Police Department: The Police Department spent many hours responding to requests for incident data near schools. DataSF helped create a simple tool to divert requests. • Civic Collaboration to Deploy Adopt a Drain: Partnered with Public Utilities Commission, Public Works and Code for San Francisco to create “Adopt A Drain,” which engages civic volunteers to clear drains of debris to help limit city flooding. 	

BACKGROUND AND DESCRIPTION OF OPERATIONS:

San Francisco was one of the first cities in the country to establish an open data policy in 2009, which was codified in the city’s administrative code in 2010. While San Francisco has had many early successes in open data, including the launching of the open data portal, the City realized it needed to do more. In 2013 changes to the open data legislation established the role of Chief Data Officer (CDO) and Data Coordinators in each department. Joy Bonaguro was hired as the City’s first CDO and tasked with creating the institutional framework to grow, mature, and sustain San Francisco’s open data program.

Major accomplishments since 2014 include a full inventory of all datasets available in the city, providing data publishing automation to departments, enabling inter-departmental use of confidential data via a the ShareSF program, establishing metadata standards, and increasing the data and technical abilities of City employees through Data Academy, a joint training venture with the Controller’s Office. As of 2016, two-thirds of public datasets are published. Recent streamlining of processes in the publishing process has seen a 171% increase in publication activity in FY 2016.

The DataSF office has also grown in size with the addition in 2014 of Jason Lally, Open Data Manager, and in 2015, Janine Heiser, Open Data Services Engineer, who are together responsible for the rapid increase in the departmental publishing rate. In 2016 Erica Finkle joined as the ShareSF Program Manager and has facilitated the internal sharing of confidential data. Two new positions will also be added to the team in the form of a Data Scientist, who will help expand the analytics work of DataSF, and a Services Engineer, who will help create a public-facing community notices application for the city.

ADVICE TO A NEW CDO:

- **Check Your Ego:** “No one who is local cares about your fancy title. In fact, they may view it as a bad thing.”
- **Take Time to Develop Relationships:** “A great deal of data work requires trust, and relationships are the foundation for trust. This is deeper and more varied than a client relationship. It includes identifying what relationships you need to broaden support and understanding of the work you are doing beyond single projects. And sometimes it is about creating the forum for others to develop relationships.”
- **Be Aware of organizational Placement:** “Where you sit in the organization will influence the scope and nature of your work. Be conscious of how your office relates to other offices and where natural coalitions or tensions may exist. At least in the beginning, your organizational placement will heavily shape what is expected or anticipated both in terms of work and relationships. Don’t be constrained by this, but be aware of it.”
- **Don’t Obsess about Quick Wins:** “Sometimes taking on particular challenges or thorny issues may get you more success than a quick win that may feel trivial or political. Your flexibility here will depend on both organizational placement and the relationships you cultivate.”

ORGANIZATIONAL CHART:



WASHINGTON, D.C., PROFILE

<p>FAST FACTS:</p> <ul style="list-style-type: none"> • Leader: Barney Krucoff, Chief Data Officer (also serves as an executive in the IT Department) • Reports to: Office of Chief Technology Officer Year established: first CDO hired in 2016 • Team name: Office of the Chief Technology Officer Data Team • # on team: 19 	<p>BIO:</p> <p>Barney first joined the D.C. Office of the Chief Technology Officer (OCTO) in 2004 as part of the GIS team. He left for a period to work with the State of Maryland in similar roles prior to returning to OCTO as Chief Data Officer in June 2016. His also worked at the National Capital Planning Commission, a civil engineering company in the private sector, doing mapping and planning work.</p>
<p>KEY FOCUS AREAS:</p> <ul style="list-style-type: none"> • The CDO mission is to improve the quality and lower the cost of city/department services through collective investment in and effective application of data and systems and reach beyond the city/department by making data freely and publicly available to the fullest extent possible in consideration of safety, privacy, and security. • With the creation of the CDO position in 2016, several formerly separate divisions were merged to create an integrated data analysis and visualization team. The CDO team is responsible for: data curation, development, data visualization and analysis, and GIS/mapping. The largest of the pre-existing teams was GIS, which had been an area of strong focus for over a decade. 	
<p>RECENT/NOTABLE PROJECTS:</p> <ul style="list-style-type: none"> • Open Data Policy: The CDO has drafted a Data Policy and is taking public comment on it before finalizing it. It is available on Drafts.DC.gov, a site that allows public comment on a variety of issues and policies in progress. Public comments are visible to all. The policy will not only specify what data is open, but also what data should remain closed. The policy carefully defines terms, and lets the public know what datasets are public, entered into the portal for internal use, or left to be subject to FOIA. • Open Data Portal: The open data portal reaches a wide variety of users inside and outside government. In one example of an unexpected use of the data portal, CDO Barney Krucoff was surprised to find that the local union of pile drivers uses the portal to check for recently-issued permits as a way to predict future work sites. After the head of the union came to see and thank his team, he told Data-Smart, “They made a point of stopping by our office to tell us how much they liked the data, so I thought that was pretty cool; the data is a lead generator for them.” • Citywide Addressing System: D.C. has a very successful addressing system, built as a Service Oriented Architecture. The addressing system is the system of record for all business and residential addresses, and is relied upon by the 911 system, so it has to be current and accurate. Within the GIS team, there is a full-time person who is responsible for address integrity and accuracy, the official “address desk” in city hall. Addresses are inherently local data so the city is the authority on what address is real or not. For example, if someone comes to the city for a permit, the address is checked against the addressing system. If it doesn’t look like a valid address, they have to work with the address desk to sort it out. 	

BACKGROUND AND DESCRIPTION OF OPERATIONS:

The position of Chief Data Officer was created by Executive Order, and in January 2016, Mayor Muriel Bowser announced she would hire a Chief Data Officer. In May of 2016 Barney Krucoff was appointed to this leadership role. The leadership of the new CDO position joins existing teams including those responsible for business intelligence, geographic information systems (GIS), and the citywide data warehouse.

For over a decade, the GIS team has worked well with city departments, with a centralized team and GIS specialists in several departments. This community of practice is supported by city training opportunities. The goal now is to create the same spirit of mutuality in the data analyst teams that has existed for the GIS teams. The data analysis and customer service teams are broken into subject matter areas, such as health, education, etc. D.C. is poised for success in this area, as the citywide data warehouse can facilitate data analytics as well as data sharing across departments. The data curation team manages the citywide data warehouse, as well as all collection, review, storage, and archiving of city data sets. They manage interagency data flows as well as all ETL operations and the open data program.

D.C.'s [open data portal](#) is strong on GIS data, in keeping with the historical concentration of the team on GIS work. The city also makes all strategic plans for departments and initiatives available on a single [integrated portal](#), which is arranged thematically and searchable by topic. In addition to a robust open data portal, there is a great deal of open data available about the operations of D.C. government, including [GradeDC](#), a site that aggregates social media feedback on the customer service of city departments, and [TrackDC](#), a performance management dashboard with hundreds of performance metrics on city government operations, including 22 for the Office of the Chief Technology Officer. Among the 35 workload measures is public information for CDO efforts such as creation of department dashboards, GIS users and datasets downloaded, and GIS training access.

ADVICE TO A NEW CDO:

- “Hire, coach, and train creative, motivated staff members and contractors. It is the most important thing you do. The right team solves problems; the wrong team makes problems.”
- “Strive to increase the velocity of data flow by reducing friction on data flow. Technology, such as open data portals, plays a role. Policies and budgets are often the biggest friction points.”
- “Offer carrots—you probably don’t have much of a stick anyway. In government transactions, costs are high. The best incentives make it easy and cheap for stakeholders to do the right thing.”
- “The technology is never as complex or as simple as those selling it want to make it seem.”

ORGANIZATIONAL CHART:



SOURCES

News Articles, Presentations, Research Reports, and Scholarly Journal Articles:

Brad Brown, David Court, and Tim McGuire, March 2014, “Views from the front lines of the data-analytics revolution,” *McKinsey Quarterly*.

Thomas H. Davenport, December 2013, “Analytics 3.0,” *Harvard Business Review*.

Mario Faria and Debra Logan, January 2016, “Staffing the office of the CDO,” *Gartner*.

Mario Faria, November 2015, “Successful organizational design principles for the office of the chief data officer,” *Gartner*.

IBM Institute for Business Value, 2011, “The power of analytics for public sector: Building analytics competency to accelerate outcomes.”

IBM Center for the Business of Government, 2015, “Using innovation and technology to improve city services.”

Jascha Franklin-Hodge, Chief Information Officer, City of Boston, 2015, “Citywide analytics team, 2015 year in review.”

Julio Hernandez, Robert Berkey, Rahul Bhattacharya and Chad Vaske, March 2014, “How to become an analytics-driven consumer packaged goods company,” *Accenture*.

Julio Hernandez, Robert Berkey, and Rahul Bhattacharya, 2013, “Building an analytics driven organization: Organizing, governing, sourcing and growing analytics capabilities in CPG,” *Accenture*.

Valerie A. Logan, February 2016, “The life of a chief analytics officer: A high-wire balancing act,” *Gartner*.

Brian McCarthy, Robert Berkey, Chad Vaske, 2015, “Launching an insights driven transformation building and sustaining analytics capabilities across the enterprise,” *Accenture*.

McKinsey, April 2016, “The need to lead in data and analytics.”

Thomas W. Oestreich and Frank Buytendijk, July 2016, “Why you need to rethink your data and analytics roles now,” *Gartner*.

Partnership for Public Service, November 2013, “From data to decisions III: Lessons from early analytics programs.”

PwC, 2016, “Data-driven: Big decisions in the intelligence Age.”

PwC, February 2015, “Great expectations: The evolution of the chief data officer.”

Svetlana Sicular, August 2014, “Big data analytics failures and how to prevent them,” *Gartner*.

Jeb Stone, “Centralized vs decentralized analytics: All you need to know,” April 22, 2012.

Andrew Therriault, 2016, “The future of data science in the City of Boston,” Presentation by Andrew Therriault, Chief Data Officer, City of Boston, 2016 Boston Data Festival.

Interviews:

- Joy Bonaguro, Chief Data Officer, City of San Francisco, interview by author, April 1, 2016.
- Andrew Buss, Director of Innovation Management, Office of Innovation & Technology, City of Philadelphia, interview by author, August 31, 2016.
- Ray Campbell, Executive Director, Center for Health Information and Analysis, Commonwealth of Massachusetts, interview by author, September 21, 2016.
- David Edinger, Chief of Staff, Office of Mayor Michael B. Hancock, City and County of Denver, interview by author, September 19, 2016.
- Jascha Franklin-Hodge, Chief Information Officer, City of Boston, interview by author, October 26, 2016.
- Kelly X. Jin, Policy Advisor to the U.S. Chief Technology Officer, Office of Science and Technology Policy, Executive Office of the President, interview by author, September 15, 2016.
- Kristina Johnson, Senior Consultant, Edward J. Collins, Jr. Center for Public Management, John W. McCormack Graduate School of Policy and Global Studies, University of Massachusetts Boston, interview by author, September 9, 2016.
- Tyler Kleykamp, Chief Data Officer, State of Connecticut, interview by author, February 1, 2016.
- Barney Krucoff, Chief Data Officer, Washington, D.C., interview by author, September 30, 2016.
- Laura Meixell, Analytics and Strategy Manager, Department of Innovation and Performance, City of Pittsburgh, interview by author, March 10, 2016.
- Kevin Miller and Erica Garaffo, Data Analytics Team, City of San Jose, interview by author, May 25, 2016.
- Lynn Overmann, Senior Advisor to the U.S. Chief Technology Officer, Office of Science and Technology Policy, Executive Office of the President, interview by author, September 15, 2016.
- Theresa Reno-Weber, Chief of Performance & Technology, Louisville, Kentucky, interview by author, August 22, 2016.
- Benjamin Shaffer, Director of Performance Management for the State of Rhode Island, interview by author, August 8, 2016.
- Owen Stone, Senior Associate, Public Sector Innovation at Living Cities, interview by author, August 29, 2016.
- Andrew Therriault, Chief Data Officer, City of Boston, interview by author, September 26, 2016.
- Oliver Wise, Director, Office of Performance and Accountability, City of New Orleans, interview by author, September 19, 2016.

ABOUT THE AUTHOR

Jane Wiseman is an Innovations in American Government Fellow at the Ash Center for Democratic Governance and Innovation. She leads the Institute for Excellence in Government, a non-profit consulting firm dedicated to improving government performance. She has served as an appointed official in government and as a financial advisor and consultant to government. Her current consulting, research, and writing focus on government innovation and data-driven decision-making. She is leading an effort to create a national network of urban Chief Data Officers to accelerate the use of analytics in local government. She has advised the US cities funded by Bloomberg Philanthropies in their Mayors Challenge competition. She has written on customer-centric government, data-driven decision-making in government, pretrial justice, and 311 for a variety of audiences.

Her prior consulting work has included organizational strategy, performance management and eGovernment strategy work for Accenture and Price Waterhouse. Selected clients include the National Governor’s Association, the United States Department of Veterans Affairs, the National Criminal Justice Association, the Commonwealth of Massachusetts, the United States Postal Service, the State of Michigan, the United States Department of Housing and Urban Development, and the United States Department of Commerce.

Ms. Wiseman has served as Assistant Secretary, Massachusetts Executive Office of Public Safety and as Assistant to the Director for Strategic Planning, National Institute of Justice, United States Department of Justice. Ms. Wiseman represented the Justice Department on detail as a Staff Assistant for the US House of Representatives Appropriations Committee. Ms. Wiseman holds a Bachelor of Arts in Government from Smith College and a Master of Public Policy from the Harvard Kennedy School.

ABOUT THE CIVIC ANALYTICS NETWORK

Based at the Ash Center for Democratic Governance and Innovation at the Harvard Kennedy School and funded by the Laura and John Arnold Foundation, the Civic Analytics

Network is an affiliation of chief data officers from the largest and most innovative municipalities in United States. They are open data stewards, internal consultants, and performance managers. The network seeks to advance the use of data and analytics in municipal governance through facilitation of in-person meetings among members and production of research and documented best practices. For more on the Civic Analytics Network, please visit <http://datasmart.ash.harvard.edu>.

ABOUT THE ASH CENTER

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