

Building the Data City of the Future

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1. Introduction

The 21st Century City is a growing and thriving environment where the majority of the world's population lives, where new generations are choosing to call home, and where city governments are at the forefront of improving public services and implementing new ideas (WHO 2010).

As cities begin to retract from fluid borders, governments must also be agile and readied to respond to the changing needs of their constituencies. To do so, it must undergo a transformation that changes its culture, its perspective on data use, and its value on human capital. These changes must be connected to an organization that is mission-driven and has the potential to deliver outcomes for all people.

As executive Director of the Center for Government Excellence (GovEx) at Johns Hopkins University, I have led a team that has provided technical assistance to nearly 100 cities in the U.S. and abroad as part of the Bloomberg Philanthropies What Works City Initiative. At GovEx, I have seen how mid-sized cities are adapting, and not adapting, to the 21st century challenges.

The good news is there are fundamental, easily accessible practices that can help catapult government into and beyond the 21st century. These practices include operationalized culture

change, effective data management, city-wide performance management, advanced analytics projects, and collaborative networks.

Through the lens of what works, this white paper will begin by describing what is possible when 21st century practices are in place in Government. Then, I will describe the five key components in greater detail, provide examples of real-world implementation, and discuss challenges and questions for practitioners to consider when seeking to improve service delivery and conditions for residents.

1.1 Living in the City of the Future

The city of the future is not beyond our grasp. The elements are already being tested and implemented globally with some public sector organizations paving the way. These ideas are not being driven by large federal governments hamstrung by bureaucratic rules and antiquated visions of progress. Successful approaches are incubated and hatched in local communities around the globe.

This trend is showing no signs of slowing, and the 21st century will continue to see local governments embrace new ideas faster, more efficiently, and with greater impact than large federal programs.

What does this all mean? Think for a moment about the potential of a proactive system of government. One that seamlessly delivers services for residents in response to their most pressing needs. Here is a futurist perspective on the potential.

Imagine you wake up one morning to a construction crew outside your door. When you go to investigate you learn that a sensing system detected low water pressure from your city-owned lines. The City dispatched a rapid-response team to investigate and repair before this small issue became a main break. The leak was detected by devices that float through the city's water system to detect leaks in real time (Chandler 2014).

Further down the street, you notice another crew repairing utility lines. The lines were scheduled for repair in the following year, but proactive city employees elevated the repairs to a higher priority. This issue was detected by systems that analyze data from city vehicles equipped with image recognition technology, enabling the city to address the problem before it became worse (Patterson 1997).

While you're talking to the team doing the work you notice less traffic than usual in the bike lane that is routed between your car and the sidewalk. Residents were informed about the two repair projects, and their mobile applications suggested alternative bike routes to avoid the construction areas (Verhulst 2016).

You are about to start your routine jog around the neighborhood when your fitness band sends a message about current air quality conditions. The city's air quality sensors in your neighborhood are detecting a pollen that you are particularly sensitive to, and you decide to exercise indoors (Clean Air Partners).

After your workout, you post a message to social media about your evening plans downtown, and the city's social media monitoring programs notice hundreds of people who say they are going to the same event. Streetlight timing is slightly adjusted in anticipation of the influx of people, and more traffic officers are dispatched the area (Remnev 2015).

The next day, you attend the final class of a computer programming certificate course. Upon completion of the final assignment, you receive an email from the city's human services department with a list of employers who are seeking applicants with your new skill (City of New Haven).

Each of these examples represents a shift in reactive city service delivery to proactive service delivery. But from experience, implementing proactive services requires a city to make proper investments in fundamental services, which I will discuss in the next sections.

2. Building the City of the Future

Fundamentally, the city of the future is one that responds to resident's needs in a proactive way.

But how do you do it?

According to Stephen Goldsmith, the proactive, or responsive city delivers services “whenever and however citizens need it. The result is a smarter and nimbler government that better deploys its resources and attention” (Goldsmith 2014).

However, there are major prerequisites that Government must address before achieving the responsive city goal. This paper contends that in order for cities to create and sustain a shift to responsive governing, governments must focus on five key operational areas: cultural transformation, data management, modernized performance management, and the capacity to leverage advanced analytics. In addition, cities will need to rely on networks based in both public sector organizations and philanthropic initiatives to hasten progress and achieve their goals.

2.1 Cultural Transformation

Before technology, before hiring the best and the brightest, and before adequate resourcing, cities must first shift their thinking toward a problem solving culture where ineffective practices are replaced with bold new ideas.

An entrenched government culture is often the biggest barrier to success. The good news is that open government and trends toward transparency are now being recognized as important tools in countering the negative effects of bureaucratic administration (Kornberger 2017). Mayors across the United States participating in What Works Cities have cited bureaucratic cultural barriers as one of the biggest challenges to getting a data practice off the ground (What Works Cities 2017a). The most successful programs have avoided bureaucratic pitfalls by starting small, demonstrating the ability to have quick and efficient wins, and carefully scaling.

The following sections describe examples of successful culture change in city government, and discuss several factors that need to be addressed when seeking to institute cultural change.

2.1.1 Examples

Recognizing that internal capacity-building is crucial for culture change, the City of Denver created Denver Peak Performance. DPP is a training program offered to all City of Denver employees, as well as city employees from other cities around the country. The training program is part of Peak Academy, a program that trains public servants to adopt a continuous improvement philosophy in government operations (Peak Academy 2017). Peak Academy has been cited with significant savings to the City of Denver but most importantly, it has been credited with boosting the morale of the public sector and affording participants the opportunity to engage in meaningful reforms.

The City of Louisville, Kentucky established the Office of Performance Improvement and Innovation to help Louisville employees rapidly test and implement new ideas. One great example of their work, using “innovation” funds and a public-private partnership model, the City designed and implemented a low-cost sensor to detect fires in abandoned buildings (Louisville 2016). Real-time data from remote sensors in abandoned buildings helped city officials detect

fires in places where traditional fire detectors were not feasible. LouisStat, Lean training, and the prestigious Innovation Award are all a part of Louisville's strategies to engage the public sector in meaningful and creative ways. The effort has garnered a lot of national attention and is evidenced by employee sentiment across the city.

Taking this cultural change to the next level, Louisville recently launched the "LouieLab," a public space for the city and community to collaborate and solve problems (Hickey 2016). The space hosts meetings, hackathons, and other events that bring the public in direct contact with the city's innovative efforts.

The City of Austin has a similar program called the "Idea Accelerator," which is an internal application for city employees. Austin's Idea Accelerator elevates new and transformative ideas from city employees (City of Austin).

2.1.2 Discussion

Changing a city government's operational culture toward data-driven decision-making is a constant challenge that requires care and attention by senior leadership. Cities can no longer rely on status quo policies and practices to deliver improved results for residents in the digital age. There are several factors to consider when implementing cultural change: strategic vision, departmental silos, risk taking, and new positions.

Absence of Vision

In the absence of a clear vision or ambitious goal, a government can become rudderless. A lack of vision gives way for rapidly shifting priorities, organizational confusion, and reactive governance. The bureaucracy will retreat from reform efforts when there is a pattern of low

return on investment. Staff that has experience in fits and starts of reform will be the first to hide from new ideas.

Therefore, government needs a way to operationalize new ideas. Too often, an over reliance on pilots has led to major difficulty integrating best practices into entrenched behavior. When there is a chorus of “I don’t have time to engage in that new practice” in your organization, you have a problem.

In addition, as a byproduct of term limit safeguards, government has earned a reputation as the place where good ideas go to die. Large bureaucratic systems have evolved into labyrinths of rules, policies and regulations that serve as a deterrent to new ideas. While many of the safeguards in place are important in reducing the risk of fraud and abuse, they can also be inhibitors of progress. Government must create safe spaces that allow people to take risk, think differently, and try new ideas. This starts with a culture that is committed to a vision, energized by their mission, set up for success, and not afraid of failure.

When humans fear the message that data is conveying, even if they are not responsible for inputs, there is an incentive to create barriers to accessing data. A strong vision that is directly tied to city operations and service delivery can alleviate concerns these data sharing concerns.

The Silo Effect

Cultural transformation is also made more difficult by the silo effect. Governments have created too much of a divide between Information Technology and programs (Latham 2016). The move to centralized IT created a number of efficiencies and added benefits to the government. However, this shift led to a growing divide between the program work and technology needs.

Technologists left agencies behind and solution-building became disconnected from service delivery.

What this has left is a bureaucracy that has major difficulty in scoping data-rich application development. Data that is created by one department often goes unnoticed by other departments that could use the data for high impact purposes. This leads to employees struggling with internal barriers as much as the external problem being addressed.

Cities can work to break departmental silos by encouraging multi-disciplinary approaches to strategic planning and operations. Setting cross-agency or cross-sector goals often works to bust silos. The key is to use a multidisciplinary approach that implicates the public sector workforce. Having an articulated goal is only the first step. The routines that are built around cross-sector frameworks must also encourage intra-program evaluation, collective data sharing, and regular data-driven convenings that highlight the efficiencies of the work. The biggest barriers to cross sector work, real or perceived, are often due to legal concerns.

Legal Roadblocks

Government legal frameworks designed to protect privacy and reduce corruption should be revamped to encourage data sharing for research and policy development. Many data efforts are hampered by government lawyers who are better at getting to “no” than getting to “yes.” Cities need legal partners that understand the important spirit of protective law but also place a high value on data sharing and its potential impact.

The legal and policy frameworks for sharing data between agencies and the public should protect restricted information, as well as specify appropriate ways to use or transform restricted information. However, established frameworks are often inflexible in accommodating productive

reuse of data. Government lawyers should have access to training in both the use of data and the application of data to problem solving. The federal government should review programs like FERPA and HIPAA in light of 21st century tools for data protection, encryption, and security. Local governments should do massive regulatory reviews on implementation strategies for federal protective acts that may hamstring their ability to share data.

Cities have some legal and regulatory powers to define how data is used and shared via formal data policies. These policies reduce the uncertainty and ambiguity about who owns which city dataset, and what can be done with it. In the coming years it will be local government that creates the need for wide ranging reforms on how data is transferred between program-level and federal-level funding streams. The federal government should study how well-worn paths blazed by decades old reporting routines both help and hurt local governments ability to use data.

Risk Taking

Cities must create safe spaces, both physical and in policy, for teams to take risk. Sometimes just looking up from your cubicle and being given some space to examine a process that is slowing down outcomes is all it takes to facilitate problem solving. When teams are given the space to collaborate, test new ideas, and experience the benefits from their efforts, trust is built and the room for more risk-taking grows.

To facilitate risk-taking, cities can establish “innovation labs,” taking cues from the modern library, to encourage employees and residents alike to learn new skills and find novel solutions to city problems.

New Positions

Government needs to cultivate program level positions that can translate barriers to success into technical terms. These include Chief Data Officer, Chief Analytics Officer, Chief Innovation Officer, among others. Much like the Product Manager role in the private sector, Governments will need to build the capacity to scope new programs, products, and service delivery innovations in a way that is indicative of technology modernization (Cohen 2010). This does not mean that Government must stack the decks with steep technological or analytical skill. Government should leverage training programs to deepen the skills of current public sector workforces. Local governments from New Orleans to Boston are partnering with higher education institutions to expand training opportunities and invest in the skills of their people. These partnerships also facilitate low cost labor for analytics and more sophisticated research methods.

2.2 Data Management

The second key practice in developing a problem solving culture is to begin thinking of data as an enterprise asset. Treating data in this way helps cities organize and maintain their data for use in a variety of operational settings.

Data management is a foundational element for the purposes of implementing a responsive city, since such systems require “the development of an appropriate infrastructure of information and communications, using a common platform that enables gathering, measurement and analysis of data and the monitoring, optimization and control of all the systems involved” (García 2016). These principals are key to a government-wide data program. This includes all data that a government produces, not just data that will ultimately be made public. A common mistake in data governance approaches is orienting the framework around Open Data. Open Data, or the

readiness for data to be shared with public, is one element of Data Governance. However, successful initiatives will be far more comprehensive than the limits placed on publicly available data.

2.2.1 Examples

Cities must invest in systems that allow for the seamless interaction of data and decision-making. In jurisdictions that have made this work, data governance becomes a key facilitator for interdepartmental collaboration. In addition, cities must develop the capacity to manage data at the enterprise level in order to benefit from advancements in technology. The following are examples of city data management practices and investments.

In New York City, the Mayor's Office of Data Analytics identified the need for a data warehousing system to connect data from all of the city's departments. This system contained data from a variety of departments, including fire, building inspections, and code enforcement, among others. The unified warehouse solved the problems endemic to city data living in disconnected systems, and allowed analysts to gain insights by combining data to make predictions about building fire hazards (Feuer 2013).

An effective use of data requires standards and uniform protocols for the sharing of data across a variety of systems, users, and infrastructures. Data should move as freely as possible between the various components of the city. In order to create the environment where data can move, cities are starting to think about cross sector standards at the metadata level (Center for Government Excellence 2016a). One standard, Open311, has been implemented in dozens of cities and has opened the potential for cities to use each other's 311 data for a variety of analytical purposes (Open 311).

To establish the standards for how smart city components should operate, many governments have adopted data policies to guide the creation, maintenance, and publication of data for both internal and external use. This policy is developed when regular routines around data use are established through a citywide commitment to governance (Center for Government Excellence 2016b).

Kansas City, Missouri has implemented a data policy and a data governance team to help foster strong data management practices throughout their city organization (What Works Cities 2017b). Their formal policy specifies a workflow that covers dataset identification, issue resolution, and online publication. Kansas City also conducts a comprehensive resident satisfaction survey to collect data that informs all of its data management decisions. This survey provides high quality data that is readily available for analysis using the city's other high quality datasets (City of Kansas City, MO).

2.2.2. Discussion

Over the last 20 months, the Center for Government Excellence visited nearly 100 mid-sized cities as part of Bloomberg Philanthropies' What Works Cities Initiative. The charge was to collect a national baseline of the state of data practice. What GovEx discovered was that many cities have invested in IT solutions for managing and releasing data to the public, but very few have actually created regular routines around data and the practice of data use in their governments. This lack of routine and focus has created a hauntingly similar fatigue that performance programs are facing.

Welch et. al. surveyed local governments to investigate the factors that lead to increased data sharing within governments, and between governments and external organizations (Welch 2016). They provide evidence to support the hypothesis that governments are more likely to

share data in coercive, persuasive, and technically competent environments. Coercive forces include laws, regulations, and policies that require city departments to share data. The persuasive mechanisms include collaborative projects between agencies and external organizations. Finally, technical capacity includes, but is not limited to, and openness toward social media, cloud based systems, and open source technologies. In each of the previous examples, coercive, persuasive, and technical factors were at play in facilitating city data sharing.

When a city lacks a formal data management strategy, it creates, maintains, and publishes data in an ad hoc manner. This often results in individual departments or agencies developing their own set of non-interoperable data management “silos.” There are several reasons why cities are reluctant to share data: fear, cost, ownership, and priority (Conradier 2014). Developing a strong data management program can help address these concerns and create the conditions for interconnected and innovative operations.

The lack of connected data results in a major loss of efficiency in government, where “too many public servants working in back offices are often reduced to human APIs - retyping information from one system to another, and stuck processing the repetitive common cases that shouldn't need any human intervention at all” (Shelter 2016).

Data management does not require a large investment in enterprise IT or expensive technological solutions. People and the willingness to engage in the work drive all the key elements. At the Center for Government Excellence we recommend an approach that includes:

1. Data Inventory. One centralized catalog of the data that exists across your government. Key features of a data inventory are:
 - a. Source of the data;

- b. Frequency of updates;
 - c. System of origin; and
 - d. Data fields.
2. Create a Governance Committee. Governance committees, often enabled through policy or executive order, define regular participants in data governance sessions. The purpose of the sessions should generally be to:
- a. Shape how data is collected;
 - b. Ensure IT solutions procured by government have the capacity to share data with little friction; and
 - c. Prioritize the release of data.
3. Invite the right people: Data governance committees should not only be staffed by IT people. It's critical that participation is inclusive. Here are some suggestions based on our experience in cities:
- a. Major program subject matter experts;
 - b. Senior staff or people who have steep decision-making authority;
 - c. The public. Some local governance committees have mechanisms for citizen engagement. This can be accomplished by platforms that allow citizens to nominate data they'd like released or direct participation in process;
 - d. Yes Lawyers. A lawyer who can focus on protecting privacy but shares the overall goal of the program;
 - e. IT leadership; and
 - f. Communications people.
4. Systems Inventory. Every government should know where and how their data is stored. Ask your IT team leads to provide an inventory of the different systems that produce data. Think about standardizing how data is collected across the city's vast systems.

5. Decision Making Authority. Data governance committees must be able to lead and influence policy around IT investments and data standards.

2.3 Modernized Performance Management

While the city of the future implements the processes and practices to make responsive services possible, it is important to closely monitor program performance in real-time to ensure that operations align with outcomes. Too often, cities implement policies and disburse funding for programs without the proper mechanisms in place to track progress toward outcomes. The city of the future must invest in agile methods that will help with smarter investing and resource allocation.

2.3.1 Examples

The City of New Orleans is a city that took concrete actions to operationalize data driven decision-making. Starting with the ambitious goal to reduce blighted properties by 10,000 units in four years, Mayor Landrieu established the interdepartmental BlightStat meetings.

Recognizing the success of this approach, additional programs such as “QualityofLifeStat” and “ResultsNOLA” to spread the use of data to more parts of the city (What Works Cities 2017c).

Jackson Mississippi is using JackStat to monitor their own blight interventions and most recently they were able to save 100 public sector jobs by consolidating school buildings. All this decision-making occurred with a commitment to a data practice and fidelity to performance routines.

2.3.2 Discussion

To address the lack of insight into program success, cities have been implementing various versions of the “Stat” model over the decades. Fundamentally, “Stat,” or performance management, is about bringing city decision makers from a variety of departments to a recurring meeting to review data, receive analysis, and decide on courses of action and follow up. Stat relies on strong leadership to identify priorities and maintain of an ongoing routine around the use of data in enterprise wide decision-making.

Similar to the cultural transformations discussed above, performance management is about operationalizing successful problem solving strategies into the daily business of government. However, there are some pitfalls to avoid when using performance management as a tool.

Reporting Fatigue

Data producers and front line employees often look at performance programs as extra work with little return. Requests for data are poorly scoped and often without context. This sentiment creates a universally felt fatigue, and data producers quickly become data hoarders. As a result, barriers to data are created as a defense against the programs, and the programs become disconnected from frontline realities and are difficult to sustain.

The traditional stat model produced short-term results by focusing executive attention and resources on strategic priorities. However, such programs face the risk of becoming non-productive reporting exercises that are disconnected from actual decision-making. This “reporting trap” can be caused by stakeholders not trusting the accuracy or integrity of city data, the lack of executive buy-in, and lack of sufficient feedback loops into the decision making process.

Mayoral Turnover

Oftentimes, a new Mayor is elected and wants to create a data culture in the government, but the administrative staff is data fatigued. Getting started is often the most difficult aspect of the work. Mayors know that to be competitive in the 21st century they must invest in new technology, skills, and a strong data practice. However, the imperative is that the practice is at the core of the way the city operates and the way decision making is done. This must be at the core of all decision-making, including budget deliberation and legislative agenda setting.

Concerns

Many governments and the people that power them are still emerging from an era of data driven accountability efforts that were not collaborative and often culturally poisonous. Programs like NYC CompStat and even Baltimore's CitiStat had a reputation of being hard-nosed, aggressive, and non-collaborative. Even Hollywood contributed to the sensationalism with their depiction of CompStat in the popular Baltimore-based series "The Wire." Bratton, the first Police Commissioner to use CompStat and the innovator of modern PerformanceStat, has acknowledged that collaboration is the key to successful city innovation. Programs emerging now like KCStat and ResultsNOLA have been transformed to focus on collaboration and the need to draw subject matter expertise from a large pool of experts within and outside the traditional government sector (City of Kansas City, MO 2017b; City of New Orleans, LA 2017).

2.4 Advanced Analytics

When cities have shifted toward a culture of treating their data as an enterprise asset and instituted basic performance management practices, their next step is to implement targeted analytics projects that can quickly help improve service delivery.

2.4.1 Examples

The City of Santander, Spain built a network of street lights that optimize their light output given the volume of nearby foot traffic (Sánchez 2013). This sensor-actuator system of street lights optimizes the use of electricity and provides a real time response to resident needs.

The City of Syracuse, New York partnered with the University of Chicago's Data Science for Social Good program to provide technical assistance in optimizing water infrastructure repairs. Using a variety of datasets including road repair, pipe infrastructure, among others, the research team was able to identify where the water department could optimize its repair schedule. The entire project is open source, and can be used by other cities for replication purposes (Data Science for Social Good 2016).

2.4.2 Discussion

Advanced analytics, and data science projects in general, are not a panacea for the issues a city wants to address. Data science tools such as machine learning, artificial intelligence, and predictive modeling are "high risk high reward" tools. They can provide many benefits to service optimization and workload efficiency, but can also result in high costs, privacy concerns, and issues of algorithmic bias.

Privacy

When cities engage with residents in the responsive city framework, privacy implications will inevitably arise. Cities must invest in the proper skills for public servants to ensure they are able to understand and use data while minimizing the risk to privacy and vulnerable populations.

Information passing through a city's responsive infrastructure may include a user's location (latitude and longitude), a user's current activity (walking, running, or driving), or personal information (home address, health records). While this information is incredibly useful for the city in determining how services should be provided to residents, it has the potential to cause harm.

In this environment, sensitive information is recorded, transmitted, and analyzed in with more accuracy, frequency, and granularity than ever before. These facts increase the potential for data misuse and violations of personal privacy. The Obama Administration's guide "Big Data and Privacy: A Technological Perspective," features an in depth analysis of these privacy issues (President's Council of Advisors on Science and Technology 2014).

The data used to deliver these services is not fundamentally new to cities. Technology has just increased the volume and velocity of data collection and analysis. Regardless of the ability for governments to use data in new technologically advanced ways, residents must always be involved and aware of the systems, how they work, and what data they must provide in order to receive the service. Governments should design "opt-out" functionality into these systems, and implement outreach programs to inform the public about how their data is being used.

Algorithmic Bias

There are also issues with algorithmic bias. This occurs when algorithmic and data-driven processes result in prejudicial biases. These biases are not programmed into the algorithm, but they nevertheless result in negative outcomes for marginalized populations. Algorithmic bias occurs when data and processes are not properly scrutinized before they are implemented. In addition, statistical packages often make it easy for users to run a model without understanding exactly how the model works, or if the model is even appropriate for the task at hand. For an in

depth examination of algorithmic bias, see Keith Kirkpatrick's article on the topic (Kirkpatrick 2016).

The public doesn't trust government data, and data initiatives have been closely linked to programs that continue to create bias against vulnerable and minority populations. Failed policies like stop and frisk and inspection optimization can disproportionately impact poor, mostly minority communities. Cities must constantly be self aware of the potential for bias in their collection, use, and publication of data. Without a proactive focus and attention to this issue, it is very likely that data, when improperly paired with performance and decision making, can create policies and programs that are biased. At the onset of any data program, cities must commit to protecting vulnerable populations.

2.5. Networks

Government should not be forced to do this work alone. Bloomberg Philanthropies is just one example of philanthropy's investment in building the capacity of cities to use data and evidence. In addition to Bloomberg, the Rockefeller Foundation's One hundred Resilient City Initiative, and the Arnold Foundation's support of analytics through the University of Chicago's Data Science for Social Good are just a few examples of how philanthropy is deeply committed to partnering with government to find solutions and to understand the potential impact of best practices.

2.5.1 Examples

These networks, which are highly effective in sharing knowledge and information, are a powerful tool for the transformation of government.

Perhaps the most useful outcome of nation leading investments in these practices is the emergence of the city network. Organizations at the helm of these multi city initiatives, like the US Conference of Mayors, National League of Cities, and the National Association of Counties, should adopt common frameworks around data, discuss the potential of metadata standardization, and share best practices as often as possible. If leveraged appropriately these networks will facilitate local innovation by helping cities understand what practices work, identify pitfalls, and insulate risk.

In addition to the networks mentioned above, the Civic Analytics Network is also playing an important role, specific in the realm of local government data analytics, in creating linkages between cities (Civic Analytics Network 2017). CAN is an organization of Chief Data Officers that works to spread best practices in data analytics and data management to cities across the U.S.

2.5.2 Discussion

Research on innovation in the private sector shows the important role that open, collaborative, networks play in the rate of innovation within a firm, as well as the rate of diffusion across the industry (Love 2013). These communities of governments, academic institutions, and philanthropic organizations create similar benefits for organizations and individuals seeking to transform government for the 21st century.

3. Conclusion

Cities have enormous potential to make real progress toward outcomes. Outcomes that are meaningful for every resident. The key to creating the city of the future is understanding the role data will play. But more importantly, the transformation requires investing in a public sector

workforce that understands the potential, is willing to take some risk, and is ready for change.

We've already integrated deep data experiences in how we buy goods and services, think about our personal futures, and connect with important people in our lives. It's time for government to accept data as a core resource and allow it to power 21st century solutions.

Starting with an investment in the routine use of data, making connections between data and the outcomes that are most important to the thriving city, and thinking about new and innovative ways we can accelerate our success and realize our goals will all contribute the city of our future.

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