

Better Decisions Shape Better Cities: And it starts with better data!

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City Lab

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Critical decisions are made on a daily basis in city halls and council chambers across the nation—decisions on everything from budgeting and hiring to equipment maintenance and improving citizen services.

Yet, in the super-connected, data-centric era we're entering, how those decisions are reached will evolve into a new normal in municipal governance, with smart cities taking the lead.

Data-driven decision-making involves collecting and analyzing data from sensors and other Internet of Things devices dispersed around cities to reap actionable insights that enable more informed decisions.

- **Do we need more buses on certain routes?** Analyze ridership data.
- **Do we need greater police presence in some of our parks?** Study crime data.
- **Do we need better pollution monitoring in at-risk neighborhoods?** Examine health data.

Data, it turns out, has a remarkable ability to make cities more resilient and reliable, in essence giving a “voice” to infrastructure. Just consider the advantages of using data to predict maintenance needs and prevent critical failures that impact lives and livelihoods: power outages, bridge collapses, or equipment malfunctions like airport air conditioning breaking down in the heat of summer.

Data enables smarter spending decisions to keep systems running smoothly, and that can be a compelling business rationale for cities large and small.

Yet data-savvy cities don't happen overnight. In fact, it may take decades for some jurisdictions to create a supportive environment, develop a vision and roadmap, and acquire the necessary skill sets to fully enable data-driven decision-making. Others will opt for a faster track, borrowing insights and best practices from cities already hitting targets on the data front lines.

New Tool Helps Cities Assess Data Readiness



St Louis, Missouri

This Midwest city has a population of 308,626. Since 1876, St. Louis has been an independent city, meaning it is not part of any county. The mayor is the city's chief executive officer, and its legislative body is a Board of Aldermen with 29 voting members.

New research conducted by the Northeast Group and CityLab Insights and funded by Siemens indicates many cities will require a significant cultural shift to scale data-driven decision-making beyond the occasional one-off pilot. Though pilots can be effective proofs-of-concept, they don't typically encourage organization-wide change, particularly in heavily siloed environments, which cities often are.



Memphis, Tennessee

Situated along the Mississippi River, this southeastern city is famous for its musical influences. It has a population of 652,236, and in terms of land area, it is one of the largest cities in the U.S. Memphis has a mayor-council form of government.

Rather, the kind of institutional change that data-driven decision-making requires will need a major push from internal data evangelists to get buy-in from high-level leaders and personnel across city departments and disciplines to build an external data ecosystem. And that's just to get the ball rolling.

As they examined cities at varying stages of their data transformation, the Northeast Group/CityLab Insights team began to identify a common set of attributes impacting a city's ability—or inability—to move the innovation needle on data. Using those findings, they developed the Urban Maturity Model, a tiered assessment tool that helps cities monitor their progress against six key readiness indicators:



San Jose, California

With a population of 1.035 million, San Jose is the 10th largest city in the U.S. Located in the heart of California's Silicon Valley, San Jose is surrounded by well-known tech companies. The city operates under a council-manager governance structure.

Source: 2017 Census

1. Strategic vision
2. Performance definitions
3. Funding and procurement
4. Internal capacity
5. Ecosystem development

6. Innovative infrastructure development

The Urban Maturity Model gives cities a framework for assessing their readiness to scale data-driven decision-making, seeing where they are today, and then using these six targets to build a roadmap.

A Tale Of Three Cities On A Data Journey

After applying the model in a number of cities, three were selected for extensive analysis with the Northeast Group/CityLab Insights team, which included interviews and workshops with key personnel, such as CIOs, CTOs, data analysts and architects, and performance strategists, among others. Their experiences, together with the Urban Maturity Model, offer a starting point for other cities contemplating a data deep dive.

Despite differences in size, geography, and municipal structure, the researchers found that the three cities—Memphis, St. Louis, and San Jose—share similar solutions to data-driven decision-making, including the three described below.

1. Retooling the Workforce

To successfully manage today's sophisticated data platforms, cities need high-end skill sets, data scientists, analysts, and visualization designers among them. But that can be a significant pain point. In one workshop, a city's surplus of 1950s-era skill sets was mentioned. In another, there was discussion of tech-phobic employees still using typewriters and carbon paper.



Another significant challenge that cities face is competition in attracting and retaining the highly skilled tech workers they need, because the private sector wants them too. In one city, it was suggested they may have more internal capacity than they realize, but there's no city-wide system for capturing employee skills, training, certifications, and the like.

The solution? A number of potential next steps to address workforce skills gaps surfaced, including:

- Rethink hiring strategies to be more intentional and focused on skills
- Reset expectations about retaining in-demand workers; two or three years may be the norm now, not the 20 or 30 years that was once common
- Develop training programs that:
 1. Help make resistant employees more comfortable with technology
 2. Promote greater understanding of the role data can play in improving city operations and service delivery
 3. Provide interested employees an opportunity to gain advanced skills, perhaps through alliances with the private sector or a local university

- Build history into HR systems to capture employee skill sets upon hiring and update it as they acquire new ones
- Hold data/IT roundtables on a regular basis to share interests and encourage advancement

An encouraging note: some cities are seeing a public service shift, with people leaving careers in the private sector to work in the public sector.

It's not just about teaching staff to be data scientists; it's teaching our leaders to ask data-driven questions.

2. Fixing Data Dysfunction

Cities collect more data today than ever, but the devil can be in the detail. In one workshop, staffers said metadata—data that provides a sort of inventory of other data—is a big challenge. They have no single data platform, and the city is very siloed departmentally. In another city, sharing data with partner agencies, the county, the local utility, etc. is more of a struggle than anyone thinks it should be.

A lack of department-level strategic plans around data priorities and the absence of a data-driven agenda from city leadership were cited as impediments to progress during one workshop. In another, a manager lamented the lack of a culture built around data, even though the city has a clearly articulated strategic vision for data-driven decision-making. Staff in another city described a manual and very relational, let's-talk-on-the-phone culture that doesn't easily produce data.

So how do you fix data dysfunction? Among the potential solutions discussed:

- Develop a unified IT system that enables seamless data sharing among city departments, with well-defined policies and procedures that include open data initiatives
- Organize a workshop or roundtable with partner agencies to discuss how to improve data sharing
- Build outcomes-based business cases around data to validate what's measured and why; promote collaborative processes around metrics
- Encourage departments to bake data priorities into their strategic plans
- Explore ways to institutionalize data-driven decision-making so it can survive leadership changes (Chief Data Officer, Office of Innovation, council sub-committee on data innovation, etc.
- Inventory and clean up datasets so all data is documented and its integrity certain

A lot of people understand the data, but not necessarily the implications of it.

3. Selling the Data Story

Awareness of data-driven decision-making is still in the early stages—likely not a conversation starter at the local coffee shop. However, there are a number of reasons why raising visibility about cities using data to better serve the public and optimize city operations makes sense.



In one workshop, staffers mentioned some successes they’ve had using data and predictive analytics, but admitted those successes were never shared, even internally. As the conversation progressed, they realized doing so could spark interest in other departments and win points with elected officials.

Staff from another city discussed the importance of articulating data initiatives in terms that hit home with citizens. Why, for instance, would someone care how many drains the public works department cleaned last month—unless they saw the correlation between more drains cleaned and fewer flooded streets?

Still another reason to expand the data conversation beyond city hall to include citizens, civic-minded organizations, and academia is to reduce the risk that a leadership change could slow or halt progress. If the community is involved and supportive, reversing data policy would be more difficult.

So what awareness-raising tactics came out of the workshops?

- Celebrate data-driven wins internally and externally at council meetings, in newsletters and press releases, and in community forums as appropriate
- Expand the city's data ecosystem to partner on data initiatives with local organizations and institutions involved in data science and civic innovation
- Consider applying for grants that can validate data initiatives and provide funding

What Data Success Can Look Like

As cities scale their data-driven decision-making, we can expect to see more compelling initiatives like these:



7 Essentials For Moving Data-Driven Decision-Making To Scale

1. Data evangelist(s) willing and able to foster a city-wide supportive environment, internal and external, top-down and bottom-up
2. High-level, data-focused skill sets (data architects, analysts, etc.); ideally advanced data expertise in each department
3. Ability to institutionalize data-driven decision-making so it becomes the norm, not the exception or special case (as in one-off pilots)
4. Ensure data initiatives and requisite staffing have adequate funding via city budget, P3s, grants

5. A business rationale for all data initiatives, fluid KPIs, and a way to measure and report result
 6. Comprehensive policies and procedures around data, open data, sharing data, ownership of data, integrity of data, inventory of data skill sets
 7. A commitment to celebrate wins to raise awareness and educate internally and externally
- **St Louis Equity Indicators Project:** A publicly accessible online data tool is being used to analyze whether St. Louis is making progress toward reducing inequity. The project measures racial equity across 72 indicators, with annual reporting of progress in six broad areas, including economy, education, health, housing, justice, and access to city services. This data-driven decision-making initiative, a collaboration with the City University New York Institute for State and Local Governance, The Rockefeller Foundation and 100 Resilient Cities, is helping the city measure and address what Mayor Lyda Krewson describes as “[debilitating racial disparities](#).”
 - **San Jose predictive analytics for safer housing:** San Jose’s Multiple Housing team is responsible for inspecting apartments, hotels, fraternities, sororities, and other buildings with three or more units, which totals more than 4,500 units. The University of Chicago created a [data-driven predictive model](#) that helped identify the most high-risk properties so the city can inspect them more frequently to spot violations and mitigate dangerous situations.
 - **Memphis fights blight:** Working with Shelby County, the nonprofit Neighborhood Preservation Inc., and many other local organizations, the city of Memphis has been waging an uphill battle to eliminate thousands of [vacant, derelict, and nuisance properties](#) around the city. One of the early actions was to develop the Memphis Property Hub, an online, regularly updated database with details on 243,000+ parcels: ammunition for those working to bring blighted properties back as community assets. Still another [data initiative](#) would create a locally sourced data report that neighborhood leaders could automatically generate online.

A common component of all three data initiatives cited above is collaboration between cities and local nonprofits, universities, foundations, etc. Cities with access to a rich ecosystem of talent and experience—one of the targets of the Urban Maturity Model—gain critical support in a variety of forms, from community organizing to funding.