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Lamar Gardere

The Data Center of Southeast Louisiana

Allison Plyer

The Data Center of Southeast Louisiana

Denice Ross

Georgetown University

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How Data Became Part of New Orleans' DNA during the Katrina Recovery

Lamar Gardere¹ Allison Plyer² and Denice Ross³

Data intermediaries have a symbiotic relationship with government as the source of most of their information. The open-data movement in government and development of software-as-a-service technologies shaped the data landscape after Katrina. Through relationships and talent transfers with The Data Center, the City of New Orleans went from having its chief technology officer in federal prison and its data systems in shambles to being a nationally recognized leader in open and accountable government. To be effective during disasters, an intermediary should be (1) in place and widely respected before the event, (2) ready to respond immediately after the event and for the long recovery, and (3) continually scanning the horizon for changes in data and technology.

Data Capacity in New Orleans before Hurricane Katrina and the Levee Failures

Before the storm, decisions, program design, and funding in the nonprofit sector typically were based on anecdotes and preconceptions. The Data Center (originally named the Greater New Orleans Community Data Center) was founded in 1997 as a data intermediary. It had the dual goal of making statistics more relevant and accessible while building community willingness and the capacity to use numbers. To this end, we took a user-centered, demand-driven approach, starting with the statistics needed for grant writing and program design. We invested significant time attending meetings to find out what data the local nonprofit sector needed most. These observations, combined with interviews with nonprofit leaders, revealed that more than anything else, local nonprofits wanted basic demographic information about their neighborhoods to support grant writing and program planning.

In 2002, we created a highly usable website with Census 2000 data compiled for all seventy-three New Orleans neighborhoods. For each neighborhood, we published dozens of indicators, carefully curated and categorized to answer 80 percent of the questions that nonprofits had. This approach ensured that our audience did not have to plow through pages and pages of numbers to get to indicators of greatest interest. Surrounding the indicators were just-in-time explanations of what they represent and technical definitions of each indicator written in everyday language.

We also included a short narrative about each neighborhood called a "Neighborhood Snapshot" that described each neighborhood's distinctive features and history, with particular emphasis on the historic contributions of African Americans to each neighborhood. This emphasis

¹*Lamar Gardere is executive director of The Data Center of Southeast Louisiana. He an expert in civic technology solutions and strategy.*

²*Allison Plyer is chief demographer at The Data Center of Southeast Louisiana. She is an expert in applied demography and user-centered communications.*

³*Denice Ross was co-director of The Data Center of Southeast Louisiana. She is an expert in designing data systems for the public good. She is now Fellow in Residence at the Beeck Center for Social Impact and Innovation in Georgetown University.*

was chosen with the knowledge that New Orleans, for much of its history, had been majority African American, and that the contributions of African Americans are too often overlooked in official history books. In addition, we created content that addressed common questions about data. We wrote one article about how to use a proxy when the statistics you want are not available, and a series about how famous African Americans throughout history used statistics to advance social justice aims.¹ These additional efforts were essential to ensuring that our audience would find the indicators on our website relevant and compelling.

To ensure that the data would be accessible, we conducted extensive usability testing of the website.² We knew from the literature that if our site was hard to use, the credibility of our content would be reduced.³ Usability testing is a formal method of watching users interact with a system to complete a task. We conducted this testing in users' homes and offices, collecting and analyzing information about these real-world interactions to inform design improvements. Usability testing revealed specific ways to improve our categorization and labeling of indicators, as well as the location of links on the website.⁴ After these improvements were made, the website was officially launched. It became widely popular with local nonprofits and yielded an average of five thousand unique visits a month—about five times more traffic than a similar website serving the even larger and wonkier market of Washington, DC.

While the website answered 80 percent of our audience's questions, the other 20 percent of their questions could be answered by a technical assistance feature we called "Ask Allison." To build trust, rather than generically labeling this feature "Technical Assistance," we featured a staffer well-known in the community for data presentations and grant-writing trainings. Through this feature, requesters could submit any data-related question they had and get a response within one business day. With the aim of building self-efficacy to access and use statistics, we crafted each answer as a step-by-step set of instructions about how to navigate the Census Bureau (or other) website. We wrote the instructions in an intentionally friendly tone with references to current events in the city (e.g., "Happy Mardi Gras") to ensure local credibility and a personal connection. We analyzed metrics created through the use of this feature to inform needed additions to the indicators on the website based on the most common requests. We received an average of one "Ask Allison" request every business day.

In the years before Hurricane Katrina, the nonprofit and civic sector was starting to make strides in their level of data sophistication.⁵ For example, a spring 2005 internal evaluation of forty grant proposals to a local philanthropy indicated that 55 percent of applicants effectively used external metrics to make the case for their programming.⁶ But data-driven decision-making was still the exception. Nonetheless, before Katrina, the Greater New Orleans Community Data Center had established a strong reputation as a credible, friendly, and reliable partner among New Orleans' grassroots nonprofit and community leaders.

In 2005, which predates the organized federal open-data movement codified by the federal Open Government Directive in 2009,⁷ the City of New Orleans provided very little data to the public beyond that available through onerous public records requests. These were the days of e-gov, where costly front-end systems allowed users to look up one address at a time (for example, in the assessor or permitting databases) or to pay their property taxes online. Data-sharing between city departments or other government agencies (such as the Regional Planning Commission) tended to be ad hoc and quid pro quo. The city's website domain was, appropriately, cityofNO.com.⁸

It was easy to complain about the city's data management, but two real challenges prevented the city from realizing the value of metrics to improve efficiency, effectiveness, and equity of

government services: civil service and procurement. Even in a fast-changing field like technology, civil service job descriptions had not been modernized in over a decade, and they included obsolete titles from the days of punch cards, such as “Lead Systems Programmer,” with obsolete pay to match. As a result, contractors made up nearly half of the city’s IT staff.⁹ Crucial functions, such as enterprise geographic information systems (GIS), were outsourced, meaning that when Hurricane Katrina came, the city had little institutional knowledge and was unprepared from a data perspective. Because of the condition of the city’s data management, The Data Center relied almost exclusively on federal statistics before the storm; but the rapid pace of change after Katrina made local metrics essential for paving the way for an informed and equitable recovery.

After the Storm

After the storm, federal statistics about New Orleans (including the Census 2000) became instantly obsolete. At the same time, old ways of making decisions—based on historical precedence, intuition, and personal relationships—no longer worked. The Data Center was inundated with requests from the media, nonprofits, businesses, national researchers, multiple federal agencies, community-based organizations, and federal, state, and local governments. Visits to the website went from 5,000 a month to 120,000 in the two months after Hurricane Katrina.

Despite the demand, numerical facts were hard to come by. Three months after the storm, a researcher with the Brookings Institution was quoted in the *New York Times* saying it had been easier gathering data for Iraq than for New Orleans.¹⁰ At The Data Center, though our world had turned upside down, our user-centered approach meant that we knew where to start. What information do people need to accomplish what tasks? Our “Ask Allison” feature served as a funnel and a knowledge management system for the wave of increasing requests. Requests tripled from before Katrina and provided a treasure trove of evidence about the information people most needed. Population counts quickly emerged as the highest value data set. Neighborhood organizations needed information about which city blocks were at a tipping point of recovery so they could deploy their limited case management and volunteer rebuilding resources. Healthcare providers need to know where to place temporary and permanent clinics as neighborhoods slowly rebuilt. Funders needed to know which neighborhoods most needed childcare centers. Beyond the nonprofit sector, businesses needed to know neighborhood population density to consider opening or reopening stores. Federal, state, and local agencies needed population numbers to inform recovery efforts and continued program planning. Even evacuees needed facts on the repopulation of their neighborhoods to inform their own decisions to return.

The Census Bureau was unable to provide this data because between decennial census counts it produces only one annual population estimate at the county level with a nine-month lag time. These estimates were neither timely enough nor granular enough to capture the rapid changes as residents rebuilt and the city recovered. The Data Center researched a large number of administrative data sets that might be a good indicator of repopulation and publicly available with a short lag time. These sets included data from school enrollment, traffic volume, utility accounts, drivers’ licenses, passenger car registrations, voter registration and participation, and United States Postal Service (USPS) National Change of Address records and residences actively receiving mail. USPS counts of active residences emerged as an indicator that best met criteria for a consistent relationship to population while being publicly available every month with only a two-week lag.¹¹ Although the numbers were publicly available, they were aggregated to ZIP codes and carrier routes. To measure recovery, The Data Center needed counts at a more granular level with consistent boundaries. We found that the direct marketing company Valassis had this information

at the address level. In a move that foreshadowed today's movement to private-sector data philanthropy,¹² where the public benefits from privately held data, The Data Center partnered with Valassis to get monthly updates of households actively receiving mail at the address level.¹³

Additionally, technology was changing around us, as were the ways New Orleanians accessed information. Disruptive mapping technologies such as Open Street Map (launched in 2004) and Google Maps (2005) reduced barriers to producing interactive maps and fundamentally changed the user experience for navigating online maps.¹⁴ The field of crisis mapping soon popped up,¹⁵ and The Data Center began to think more about purpose-built maps and apps with a short life span customized to the needs of different phases of the recovery. In this new context we used Google Maps to build the "Repopulation Mapper" that displayed the Valassis counts on households receiving mail aggregated to the block level. More important, we posted metadata (explanation of what the data is and what it is not) in plain sight and in everyday language. We conducted usability testing in the field with tasks that replicated the frequent questions this mapper was designed to address. Usability testing yielded tweaks to titles, the location of the legend, and changes to the map display so that it was viewable even on the low-resolution screens still dominant among our local users.¹⁶

In addition to supplying high-demand information such as block-level repopulation, The Data Center found a pressing need to help community members, business investors, and policymakers at the local, state, and federal levels to better understand the pace of recovery. Katrina brought dramatic change and also flux for many years after the storm, which created chaos and confusion. Investors both public and private wondered about the strength of the economy and the housing market, the availability of needed infrastructure, and whether population was continuing to return to New Orleans. Rumors swirled about what happened to the billions of dollars of recovery funding allocated by Congress. Policymakers needed information about how to adapt and effectively deploy their resources. Operating under differing goals and priorities, decision makers found themselves in conflict with one another.¹⁷

To address these issues, The Data Center had to shift from disseminating raw indicators to analysis. We formed a partnership with the Brookings Institution to identify and analyze indicators of recovery in four domains: population, housing, economy, and infrastructure. To ensure that end users could make use of the statistical trends, we created a report entitled "The New Orleans Index," with graphics of each indicator and a one-page narrative summary of findings.¹⁸ The report was published monthly for the first two and a half years (when change was most rapid), then quarterly, then biannually, and finally annually by the fifth anniversary of Hurricane Katrina. With the aim of creating a common understanding of the trends to help inform decision makers as well as the general public to move in a common direction, we extended our reach beyond our website. We began using local and national TV, radio, and newspaper as new avenues for disseminating our findings.

The New Orleans Index built on the reputations of The Data Center and Brookings for credibility, trust, and neutrality to develop a common understanding of the recovery that was expert (informed by Brookings's expertise in trend analysis) and locally relevant (informed by The Data Center's one-the-ground knowledge of post-Katrina New Orleans). In addition, The Data Center's expertise in human-centered design ensured that the publications responded to changing needs and questions and that the publications were easy to understand and use.¹⁹ Through briefings and presentations, Brookings engaged federal stakeholders around the findings, while The Data Center engaged community groups and local officials. Media mentions averaged hundreds each year. An

independent evaluation of this multi-year effort concluded that The New Orleans Index series of reports successfully:

- Built a shared understanding and common operating picture among diverse stakeholders
- Focused conversations on solutions and stopping debates about facts
- Communicated to officials and investors outside New Orleans, reducing uncertainty and spurring investment
- Helped decision makers identify needs and adapt priorities, policies, strategies, and programs
- Spurred innovation²⁰

Another shift The Data Center had to make as the recovery progressed was to turn to the city for metrics on the recovery, since federal statistics were not timely enough or of sufficient geographic detail. The aforementioned data capacity challenges of the city became increasingly apparent. Months after the storm, Brookings alerted us that when they contacted the city's Department of Safety and Permits for the latest cumulative count of building permits, sometimes the numbers were inexplicably half the previous month's total. Years later we learned the cause: rather than adapting the existing permitting system to accommodate kiosk and online applications as demand for permits outpaced the ability of office staff to process them, IT contractors had built an entirely new permitting system (with a different data schema) to take in permits electronically. Thus, half of the permits were in-person using the pre-Katrina system and half used the new electronic interface. To compile a basic count of building permits issued post-Katrina, a city contractor had to combine these incompatible databases. This type of unnecessary complexity made any timely, meaningful analysis of city-held data nearly impossible and further entrenched the city's dependence on its ballooning force of contractors. Some of these IT contracting relationships would eventually land both the chief technology officer and the mayor in prison.²¹

With growing legal distractions among city leadership and increasingly pathological complexity in the city's IT systems, the role of The Data Center became even more important in the years following the storm. Interestingly, other data intermediaries (such as The Data Center's peers in the Urban Institute's National Neighborhood Indicators Partnership) have since played similar roles during crises in city government, notably Data Driven Detroit during the city's bankruptcy and Baltimore Neighborhood Indicators Alliance after the death of Freddie Gray in police custody.²² When local government loses legitimacy, a trusted local data intermediary can help fill key gaps until local government gets back on its feet.

The New Role of Data in New Orleans

In the early days after the storm, data sharing was still largely bilateral between limited organizations, but an underground network emerged. For example, the city's emergency operation center distributed its "Daily Dashboard" to a list of select partner entities and these entities forwarded it to other peers in the nonprofit sector. The same thing happened with other data sets, such as the Rapid Population Estimates survey results and geographic information on the city's land ownership parcels.

Government's limited sharing resulted in a disparity of information access across neighborhoods. The Broadmoor neighborhood, which was inundated with high floodwaters, partnered with the Harvard Kennedy School of Government and was able to get special access to the city's building permit data, which helped inform that neighborhood's recovery.²³ Knowing how valuable such records were for all neighborhoods' recoveries, The Data Center maintained the drumbeat of equal access for all by obtaining and republishing data about the entire city, not

just neighborhoods with the capacity to create their own numbers or connections to get special access to information. President Barack Obama's Open Government Directive came at a fortuitous time during the mayoral election, inspiring new possibilities of government transparency.

When Mitch Landrieu was elected mayor in 2010, he formed the Tech Transition Team to look into the city's data management and IT practices and make recommendations for his new administration. The Data Center's co-director Denise Ross was invited to be part of the team, and Allen Square, also on the team, ended up becoming the city's first chief information officer (CIO). As part of that work, the team reached out to some of the nation's premier municipal CIOs and chief technology officers in Boston, Washington, DC, San Francisco, and Tampa. This infusion of ideas allowed the incoming administration to rapidly modernize and open up. The new CIO focused for the first year on the uncelebrated work of creating updated civil service job descriptions (with competitive salaries), stabilizing IT systems, repairing the department's battered reputation, and modernizing procurement to accommodate new technologies, such as software-as-a-service that afforded more flexibility and agility and less risk. At the same time, the incoming CIO rediscovered the talent and experience already in place in City Hall. By listening to and empowering these seasoned voices in the city's IT department, along with hard work, tenacity, and steady management, the team was able to rebuild an old and failing infrastructure while nurturing skills that would be needed to maintain healthy systems. Healthy municipal technology systems are critical to government's ability to create, use, and share data for public benefit. With a renewed confidence and a fresh and determined focus on performance and innovation, the City of New Orleans began to attract the attention of the growing pool of tech talent developing in post-Katrina New Orleans. New Orleanians who had never before considered government service now found it a compelling career opportunity. The next CIO, Lamar Gardere, brought this effort to the next level with a citywide digital equity initiative, which included the active cultivation of high-potential New Orleanians from populations who are typically underrepresented in technology. This infusion of newly empowered voices, novel thinking, and data talent, combined with high-level commitment to open government, transformed the city into a legitimate competitor for participation in national innovation networks such as IBM Smarter Cities Challenge, the Code for America Fellowship, Rockefeller's 100 Resilient Cities, and Bloomberg's iTeams and What Works Cities.

Along the way, the city's increasingly sophisticated approach to data allowed for the same shift to analysis that The Data Center made after Katrina. Performance management was the driving force behind much of the city's data analysis. The city initiated public BlightStat²⁴ meetings (inspired by Baltimore mayor Martin O'Malley's CitiStat),²⁵ designed to bring together key staff and leaders from across city government to roll up their sleeves to meet Mayor Landrieu's audacious goal of eliminating ten thousand blighted properties in four years. Data management was a key topic of conversation for the first two years of these meetings (started in 2010). Data from multiple departments, including code enforcement and the city attorney's office, had to be compiled and verified to develop an accurate understanding of the status of each parcel. This initiative created an opportunity for the first compelling, easy-to-understand, use case for open data.

In 2012, Code for America fellows collaborated with city residents and staff to create an online tool called "BlightStatus," which—for the first time since the storm—gave residents, city staff, and leadership a single, shared view into the status of blighted properties.²⁶ Removing the asymmetry of information allowed the conversation to shift from arguing about the facts to discussing what the solutions might be. The city met their goal a year early, and by 2014 had

reduced blight by thirteen thousand addresses.²⁷ Of note, The Data Center was a symbiotic partner in the reduction of blight, having set the baseline with their 2008 report called “Benchmarks for Blight,” which took the innovative approach of using USPS records on addresses unable to receive mail (e.g., not active and not vacant) as a proxy for blight and then comparing that number across time and across cities.²⁸ The city and the public came to rely on The Data Center’s independent analysis of progress against blight.

The success of meeting the blight reduction goal was a proof of concept that allowed the benefits of open data to permeate throughout city government. City workers who had previously feared negative repercussions from releasing data found that opening up the data, even with all its flaws, generated increasing trust among stakeholders, created a mechanism for improving the data, and most important, fueled community partnerships for accelerating progress. As fear of making city data freely available subsided, one by one, city departments began opening their data to the public. In particular, the successful BlightStat initiative inspired the New Orleans Police Department to open their data, and once the police department was opening their data, it was hard for other departments to justify keeping their nonsensitive data in the dark.²⁹

As the city got more tech savvy and created more data tools, they were able to more quickly spin out high-demand data visualizations, such as damage-assessment maps of tornadoes that struck the city in 2017 or the traffic-and-flood tracking app released in August 2017 to help residents navigate frequent street floods (<http://streetwise.nola.gov/>).³⁰ These tools and visualizations increased residents’ confidence in city data. A virtuous cycle was created where data tools with relevant use cases created more awareness of the city’s data and technology capacity. Potential data users shifted their approach from simply extracting city data and building their own tools to working in partnership with the city to build tools. This shift produced better results because the city could provide insights about internal business processes and how they affected the data and its interpretation, as well as point to additional city data that could be used in each partner’s applications. For example, in 2016, after observing contractors in Detroit using proprietary methods to survey property conditions, the City of New Orleans’s IT team partnered with a local firm to cheaply collect property-condition data automatically with city-designed sensor rigs. With help from ESRI, an interface design process informed by community input, and New Orleanians willing to volunteer their time to score property conditions, the city effectively leveraged the concept of “civic tech” to crowdsource data collection on blight and property conditions.³¹

Now, the City of New Orleans is recognized as a national leader in local government transparency, with more than two hundred data sets published and its work highlighted regularly in telling the story of how data can save lives.³² The City of New Orleans was invited to talk about their data work at the launch of President Obama’s Climate Data Initiative in 2014, and two years later, the city was on stage at the White House again talking about their leadership in the Police Data Initiative. The New Orleans Police Department (NOPD) was described as the “Queen of open data” in a 2015 *FiveThirtyEight* article, and the federal judge overseeing NOPD’s consent decree described the city’s new data capacity as “a miraculous transformation.”³³ By 2016, Mayor Landrieu had signed the city’s first ever Open Data Policy designed to facilitate and routinize the release of freely available, public data in New Orleans.³⁴ In 2018, the City of New Orleans became one of only thirteen cities nationwide to receive the prestigious What Works Cities Certification.³⁵

Today, outside of attention garnered around major Katrina anniversaries (which increase the audience two-fold), the audience for The Data Center is once again primarily local, with about eight thousand visits a month to the website. The presence of this data infrastructure continues to

give New Orleans a head start when changes come its way. For example, while other communities struggle to pull information together about Opportunity Zones for federal tax incentives, would-be investors in New Orleans are easily pulling numbers on those neighborhoods from The Data Center's website. Most important, those numbers are fortified with analysis from an equity perspective that increases the likelihood of their being used for good. People with financial resources and powerful social networks have always had access to the data they need to exploit neighborhoods; The Data Center levels the playing field so that agents for good also have access to that same information.

Lessons Learned

- Lead with the people and what information they need, not the technology. By starting with data the people needed and tying those data into a change process such as blight reduction, New Orleans created a narrative (the sky didn't fall when data were released and good things happened) that inspired other domains, such as public safety, to follow suit. Often the best course is to keep the complex technology behind the scenes, using it to create simple, easy-to-digest information for the public in media formats they already consume, such as radio and morning news shows or a simple address lookup like the BlightStatus tool.
1. Build data systems *with* not *for* stakeholders. Data needs to be not only technically credible but relevant and legitimate in the eyes of the community.³⁶ The only way to ensure relevance and legitimacy is to get feedback early and often from community stakeholders. One rule of thumb The Data Center has is that if you have to conduct a training to teach someone how to use your website, you have not designed it well.
 - The value of the data intermediary lies not just in its staff but also in its role in developing talent who, through working relationships and career moves, can then transfer their knowledge to other organizations. Intermediaries also create data-savvy social networks within cities that span local government and the nonprofit and private sectors, connecting them to state and federal government.³⁷
 - Don't go it alone. New Orleans was able to accelerate its progress by partnering with respected national organizations such as Brookings, seeking out advice from municipal open-government leaders across the country, and participating in networks such as Bloomberg What Works Cities, Code for America, the National Neighborhood Indicators Partnership, and 100 Resilient Cities. A 2018 report by New America ranked New Orleans among the top 10 percent of networked metros.³⁸
 2. A data intermediary is crucial civic data infrastructure for navigating shocks and stressors, whether it be a hurricane, crime, or the emergence of smart cities technologies. An intermediary can also spur private and public investments by reducing uncertainty after a shock. It may be that community data capacity before a disaster serves as an amplifier of social capital that is well-recognized as a key element of resilience.³⁹ For example, Todd Richardson, who leads the research arm of the Department of Housing and Urban Development (HUD),⁴⁰ declared that he read The New Orleans Index every day after Hurricane Katrina to inform his decision making and that his highest recommendation for disaster-prone areas was that they replicate what The Data Center did for New Orleans.⁴¹ His doing so is particularly important because a great deal of federal disaster funding is distributed through HUD. After years of

advising communities who have undergone recent shocks, it has become clear to these authors that the time to build a data intermediary and build the necessary trust with the community is before disaster strikes.

Just as the previous decade has seen the advent of ubiquitous mapping, software-as-a-service, and open government, the next ten years will see similar uncharted territory emerge in smart-cities technology, private-sector data, and particularly in the ethical use of algorithms and artificial intelligence in local decision-making. The Data Center is positioned to develop the talent and social networks needed to leverage these emerging technologies to further improve data availability and use in New Orleans.

In addition, as The Data Center maintains its focus on the information needed most by residents of New Orleans and Southeast Louisiana, it is clear that our dissemination efforts must continue to track two existential threats to the region: disaster risk and increasing inequity. In the years since Hurricane Katrina, Southeast Louisiana has been struck by multiple hurricanes, including Ike, Gustav, and Isaac. In 2010 the massive BP oil spill damaged Southeast Louisiana's wetlands that provide the region's first line of defense against hurricane storm surge. And in recent years, frequent unprecedented rainstorms have flooded dozens of homes and businesses throughout the region.⁴² In addition, income inequality is growing more rapidly in New Orleans than the national average. Growing inequity not only negatively impacts economic growth and the provision of essential city services but hampers social cohesion and trust in government, which are critical to the resilience of a community faced with shocks.⁴³

A large share of the US population lives in areas at risk of natural disasters, such as earthquakes, hurricanes, flooding, and tornados, or even manmade disasters, such as industrial contamination or terrorist attacks.⁴⁴ Disasters compounded by inequity are growing nationwide; the challenges that New Orleans faces are not unique. Data intermediaries nationwide can play a critical role in disseminating statistics that help communities to be more resilient in the face of these current and future challenges.

Notes

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