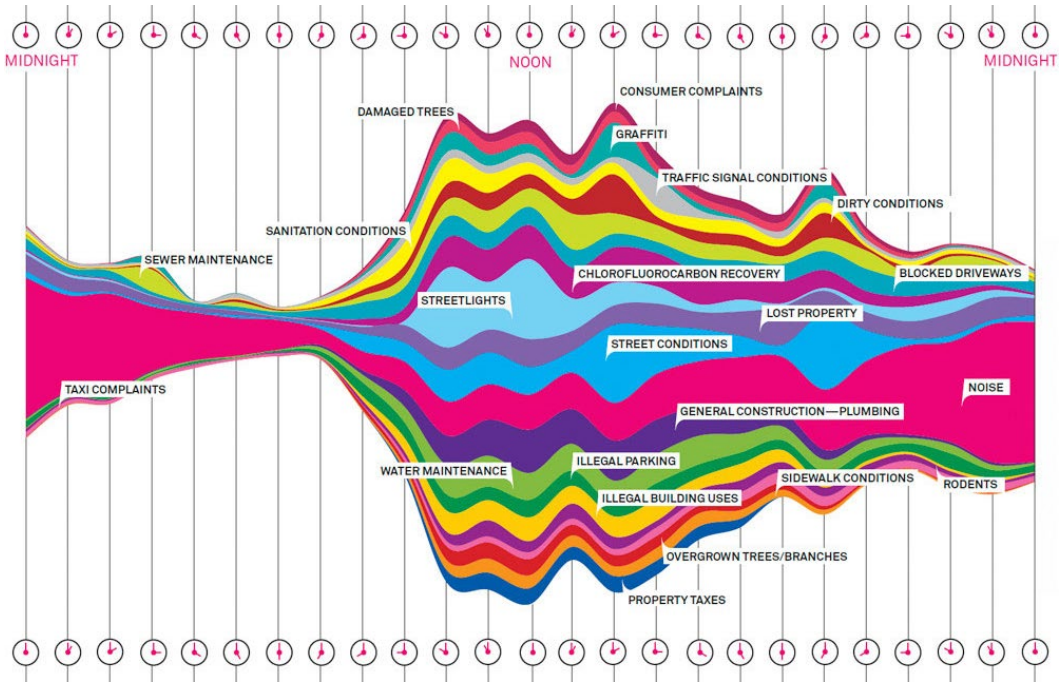
STEVEN JOHNSON MAGAZINE 11.01.10 12:00 PM

What a Hundred Million Calls to 311 Reveal About New York



There were 34,522 complaints called in to 311 between September 8 and September 15, 2010. Here are the most common, plotted by time of day. Illustration: Pitch Interactive

New Yorkers are accustomed to strong odors, but several years ago a new aroma began wafting through the city's streets, a smell that was more unnerving than the usual offenders (trash, sweat, urine) precisely because it was so delightful: the sweet, unmistakable scent of maple syrup. It was a fickle miasma, though, draping itself over Morningside Heights one afternoon, disappearing for weeks, reemerging in Chelsea for a few passing hours before vanishing again. Fearing a chemical warfare attack, perhaps from the Aunt Jemima wing of al Qaeda, hundreds of New Yorkers reported the smell to authorities. The New York Times first wrote about it in October 2005; local blogs covered each outbreak, augmented by firsthand reports in their comment threads.

The city quickly determined that the odor was harmless, but the mystery of its origin persisted for four years. During maple syrup events, as they came to be called, operators at the city's popular NYC311 call center—set up to field complaints and

provide information on school closings and the like—were instructed to reassure callers that they could go about their business as usual.

But then city officials had an idea. Those calls into the 311 line, they realized, weren't simply queries from an edgy populace. They were clues.

On January 29, 2009, another maple syrup event commenced in northern Manhattan. The first reports triggered a new protocol that routed all complaints to the Office of Emergency Management and Department of Environmental Protection, which took precise location data from each syrup smeller. Within hours, inspectors were taking air quality samples in the affected regions. The reports were tagged by location and mapped against previous complaints. A working group gathered atmospheric data from past syrup events: temperature, humidity, wind direction, velocity.

Seen all together, the data formed a giant arrow aiming at a group of industrial plants in northeastern New Jersey. A quick bit of shoe-leather detective work led the authorities to a flavor compound manufacturer named Frutarom, which had been processing fenugreek seeds on January 29. Fenugreek is a versatile spice used in many cuisines around the world, but in American supermarkets, it's most commonly found in the products on one shelf—the one where they sell cheap maple-syrup substitutes.

Fifteen months after the Maple Syrup Mystery was solved, mayor Michael Bloomberg paid a visit to the 311 call center, which is housed in the warrens of downtown Manhattan, just a few blocks east of Ground Zero. With its high ceilings, playful carpet tiles, and dual LCD monitors on every desk, the main call center room looks like a web startup, until you register the steady murmur of 150 to 200 customer service professionals working the phones. Mounted on one wall is an oversize dashboard, with chunky blue, red, and green LED pixels tallying the day's inflows by city department: calls waiting, maximum waiting time, agents on call—and the most important statistic of all, "service level," which reports the percentage of calls that are answered within 30 seconds. Bloomberg's visit this May was in honor of 311's 100 millionth call, and for the photo op, the mayor fielded one call himself. As it happened, the caller recognized Bloomberg's voice; he turned out to be a former colleague from the mayor's investment banking days at Salomon Brothers. Even the biggest cities have small towns buried within them.

There was something fitting in this unlikely connection, since 311 is designed to re-create some of the human touch of small-town life in the context of a vast metropolis. Eighty percent of calls connect to a live rep within half a minute, after a brief recorded message summing up the day's parking regulations (a major topic of 311 queries) and other relevant news. Also crucial to the 311 ethos is the idea of civic accountability: By giving New Yorkers an easy way to report broken streetlights or graffiti or after-hours construction, the service helps them play a role in solving the problems they see in their own neighborhoods.

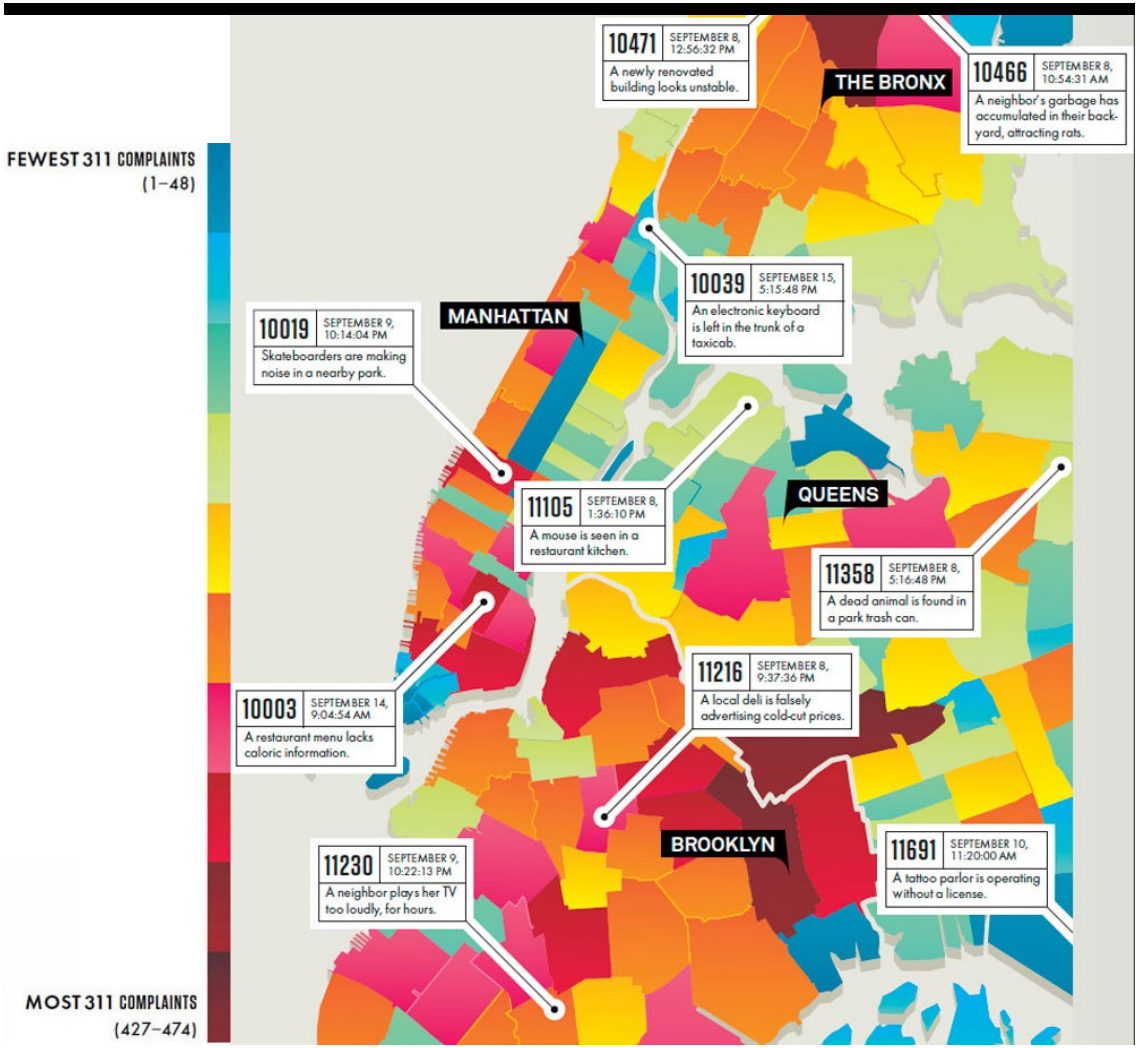
Launched in March 2003, 311 now fields on average more than 50,000 calls a day, offering information about more than 3,600 topics: school closings, recycling rules, homeless shelters, park events, pothole repairs. The service has translators on call to handle some 180 different languages. City officials tout a 2008 customer satisfaction survey, conducted by an outside firm, that compared 311's popularity to other call centers in both the public and private sectors. 311 finished first, barely edging out hotel and retail performance but beating other government call centers, like the IRS's, by a mile. (At the very bottom of the list, not surprisingly: cable companies.) Executive director Joseph Morrisroe attributes 311's stellar scores to its advanced technology, relentless focus on metrics, and employee training, which ensures that "customers will speak with a polite, professional, and knowledgeable New Yorker when they need assistance."

If anyone still wondered whether the 311 concept was here to stay, New York's 100 millionth call should have dispelled all doubts. So, for that matter, should the other 300-plus public call centers now in operation across the US. For millions of Americans, dialing 311 has become almost as automatic as 411 or 911. But—as New York learned in the maple syrup incident—

the hundreds of millions of calls also represent a huge pool of data to be collected, parsed, and transformed into usable intelligence. Perhaps even more exciting is the new ecosystem of startups, inspired by New York's success and empowered by 21st-century technology, that has emerged to create innovative ways for residents to document their problems. All this meticulous urban analysis points the way toward a larger, and potentially revolutionary, development: the city built of data, the crowdsourced metropolis.

What's Your Problem?

Some New Yorkers are kvetchier than others. A breakdown by zip code for one week in September.



As useful as 311 is to ordinary New Yorkers, the most intriguing thing about the service is all the information it supplies back to the city. Each complaint is logged, tagged, and mapped to make it available for subsequent analysis. In some cases, 311 simply helps New York respond more intelligently to needs that were obvious to begin with. Holidays, for example, spark reliable surges in call volume, with questions about government closings and parking regulations. On snow days, call volume spikes precipitously, which 311 anticipates with recorded messages about school closings and parking rules.

But the service also helps city leaders detect patterns that might otherwise have escaped notice. After the first survey of 311 complaints ranked excessive noise as the number one source of irritation among residents, the Bloomberg administration instituted a series of noise-abatement programs, going after the offenders whom callers complained about most often (that means you, Mister Softee). Similarly, clusters of public-drinking complaints in certain neighborhoods have led to crackdowns on illegal social clubs. Some of the discoveries have been subtle but brilliant. For example, officials now know that the first warm day of spring will bring a surge in use of the city's chlorofluorocarbon recycling programs. The connection is logical once you think about it: The hot weather inspires people to upgrade their air conditioners, and they don't want to just leave the old, Freon-filled units out on the street.

The 311 system has proved useful not just at detecting reliable patterns but also at providing insights when the normal patterns are disrupted. Clusters of calls about food-borne illness or sanitary problems from the same restaurant now trigger a rapid response from the city's health department. And during emergencies, callers help provide real-time insight into what's really happening. "When [New York Yankees pitcher] Cory Lidle crashed his plane into a building on the Upper East Side, we had a bulletin on all of our screens in less than an hour explaining that it was not an act of terrorism," Morrisroe says. After US Airways flight 1549 crash-landed in the Hudson in 2009, a few callers dialed 311 asking what they should do with hand luggage they'd retrieved from the river. "We have lots of protocols and systems in place for emergencies like plane crashes," Morrisroe explains, "but we'd never thought about floating luggage." This is the beauty of 311. It thrives on the quotidian and predictable —the school-closing queries and pothole complaints—but it also plays well with black swans.

A data-driven approach to urban life makes sense, because cities are in many respects problems of information management. But the problems take various forms, depending on whether you confront them as a public agency or an ordinary citizen. Governments want to know where the messes are so they can prioritize cleanups. But for city dwellers, the challenge takes a different shape, because we need to know which resource we should use to satisfy our present need. Transportation is a classic example. A pedestrian standing at any intersection in Manhattan has at least four modes of transportation to choose from: cab, bus, subway, or foot. In some cases, there are dozens of bus and subway lines within a few blocks and hundreds of taxis. Each is a potential data point—the F train that's 12 minutes behind schedule, the six cabs looking for fares just around the corner.

One way or another, that kind of data is going to be available and flowing through our mobile devices in the near future. When the city's Taxi and Limousine Commission installed television screens and credit card machines in all taxis, they also installed GPS devices that communicate vast amounts of information back to the TLC. "There are 13,000 cabs pinging back data on location, travel speeds, whether they have customers," says Carole Post, the new commissioner of New York's Department of

Information Technology and Telecommunications. “The TLC is mapping where cabs are needed in real time.” Combine that data with live transit information—and even Yelp-style reviews of the most interesting streets for window-shopping—and the decision of how to get from point X to point Y becomes far more interesting. In other words, 311 is just the beginning: As technologies evolve, all this pooling and sharing and analysis of data will allow cities to get increasingly sophisticated in how they solve urban problems.

Several promising startups—some venture-funded, others nonprofit—have begun to explore and, in some cases, expand on the 311 mission. A service called SeeClickFix lets users report open fire hydrants, dangerous intersections, threatening tree limbs, and the like. (A similar service, FixMyStreet, launched in the UK several years ago.) In proper Web 2.0 fashion, all reports are visible to the community, and other members can vote to endorse the complaints. Another startup, BlockChalk, has released an iPhone app that uses GPS data to let users create public notes tagged to specific locations. CitySourced, an angel-backed startup, has partnered with the city of San Jose to serve as a high tech frontend for its 311 system. A New York-based site called UncivilServants collects reports and photos of government workers abusing parking rules around the city and ranks the top offenders by department. (The worst abuser, by a wide margin, is the NYPD.)

By making all complaints and queries public, these services let ordinary people detect emergent patterns as readily as civil servants can. To date, New York’s 311 has been reluctant to share specific call records with the general public, but Post says it plans to open up more. “We tend to be conservative about exposing data,” she says. “There’s a legitimate concern about false claims—restaurants calling in to report rats in a competitor’s kitchen. You want to preserve the innocent-until-proven-guilty assumption. But we believe there’s an enormous amount of data where the only party that could be perceived to be ‘scarlet-lettered’ is the city: the potholes and graffiti and overturned wastebaskets. I mean, if someone wants to call in a pothole that doesn’t exist—so be it. I guess they can.”

For New York, one of the first experiments in open 311 data has been the Street Conditions Observation Unit program. Scout, as it’s known, supplements citizen reports with information collected by 15 trained inspectors who drive every street in the city—some 6,374 road miles—recording and mapping each “quality of life” problem they encounter. Their findings are then fed into the 311 system as if they had been called in by residents. In the first three months of the program, the addition of Scout data led to a sixfold increase in graffiti reports.

Scout reports are available to the public on detailed maps showing when the issue was first reported and whether it has been resolved. But the limited nature of this data makes the maps far less useful than they could be. In the generally graffiti-free blocks around my house, for example, Scout reports just two “sunken catch basins” and a “failed street repair”—hardly a thorough or useful accounting of what the city (or my neighbors and I) should be trying to fix. The rest of the information remains trapped somewhere in the 311 databases—along with all the other databases maintained by the city. Post says the Scout maps are just the beginning and promises to overlay extensive quality-of-life data on them in the near future.

But even a city government like Bloomberg’s, which prides itself on entrepreneurial flair, needs to recognize the limits of its capacity to innovate. For every promising Scout map, there are hundreds of ideas for interesting civic apps lurking in the minds of citizens. (I myself am cofounder of a hyperlocal news platform called Outside.in.) To tap that energy, New York has sponsored an annual competition called NYC BigApps, modeled after an earlier program in Washington, DC. Participants design and submit web or mobile apps that draw on information stored in the city’s Data Mine, which encompasses hundreds of machine-readable databases, including a sliver of 311 information. The first BigApps winners, announced in early 2010, were awarded cash prizes of up to $5,000 and a meal with the mayor. One winner, Taxihack, allowed users to post reviews of individual cabs and their drivers. The grand-prize winner, WayFinder NYC, superimposes directions to nearby subway stations

over photos that users take on their Android phones.

BigApps represents a new way of imagining the relationship between government and the private sector. When Al Gore set out to "reinvent government" as vice president, his solutions were, almost without exception, inward-facing: trimming red tape, encouraging cross-departmental collaboration. What contests like BigApps suggest is a more democratic idea—that some of the best ideas for government are likely to come from outside the public sector. (This is not to be confused with government contracting, in which companies tend to implement government-driven ideas with government-caliber inefficiency.)

But drawing on that outside intelligence will mean changing the way city governments do business. Startups can build applications far more quickly and cheaply than a public agency can, but the city still needs to think fast enough to ask for them—and to integrate them into the way municipalities run. After all, private-sector operations like SeeClickFix have a far easier time seeing and clicking than they do fixing. While any enterprising developer can build an app for reporting potholes, even the most well-funded company can't go out and repair them.

SeeClickFix has begun offering free dashboards that local governments can use to view real-time statistics; the premium service bundles together user-generated reports and emails them to the appropriate authorities. It's an intriguing hybrid model, in which the private sector creates interfaces for managing and mapping urban issues while the public sector continues its traditional role of resolving those issues. That link is obviously the crucial one for these new sites and apps, given how slowly the public sector tends to move in adopting new technologies. Why bother posting a complaint if authorities will never hear about it?

One promising route around this problem lies in Open311, a new project spearheaded by the OpenPlans organization. Right now, the Open311 database is used only in San Francisco and Washington, DC, and it encompasses just basic quality-of-life complaints: potholes, garbage, vandalism, and so on. But Open311 intends to eventually serve as a national, universal 311 that—unlike New York's current system—can be added to and accessed by anyone. That means outside parties can develop new interfaces, both for reporting problems and for visualizing the data. "It's designed to be a write-once, run-everywhere platform," says OpenPlans program manager Philip Ashlock, using software terminology conventionally applied to operating systems. In the current 311 paradigm, each new city is the equivalent of a different OS, because the data is structured differently from place to place. But with Open311, an app built for San Francisco can be ported instantly to work in DC.

At OpenPlans' surprisingly lavish headquarters just above Canal Street in Soho, one wall of the main floor is given over to a massive bookshelf mimicking the grid of Manhattan, complete with a diagonal line of shelves cutting across the wall Broadway-style and a green rectangle of real vegetation where Central Park should be. It's the perfect visual metaphor for the organization: embedding books full of information inside the grid. After a quick tour of the office, Ashlock explains that 311 and open source software have a great deal in common. "In the past decade or so, the open source community has developed great tools that allow a distributed group of people to track and fix bugs in a complex software application," he says. "We think we can learn a lot from those interfaces in solving the problems that cities face." Put another way: There are a million stories in the big city, and some of them are bug reports. Indeed, some of them are literally bug reports, as in the case of New York's recent bedbug epidemic, which you can track at bedbugregistry.com/metro/nyc.

Whether it happens through government services such as 311, private-sector startups, open source initiatives, or, most likely, a combination of all three, it's clear that the 21st-century city is going to be immensely more efficient at solving clear, definable problems like graffiti and transportation routes. The question is whether these platforms can also address the more subtle problems of big-city neighborhoods—the sins of omission, the holes in the urban fabric where some crucial thread is missing. After all, when people

gripe about their neighborhood, it's usually not the potholes or clogged storm drains they have in mind; it's the fact that there isn't a dog run nearby or a playground or a good preschool with space available. "We're really interested in tackling things that are problems not because they're broken but because they don't exist," Ashlock says.

And indeed, it's not hard to imagine ways that existing data sources could be used to fill holes like this. For instance, a neighborhood with a perennial cluster of booked cabs, according to the TLC reports, could be made a top candidate for additional bus lines. The best example of this to date is a pilot program in Brooklyn sponsored by OpenPlans that scouted areas needing bike racks by encouraging people to "take pictures of places where there are bikes locked up to every object in sight—to show the demand." By tapping a community—big-city bicyclists—that is already passionate about its place in the urban fabric, OpenPlans hopes to teach users some of the power of this form of community-bug reporting. Ben Berkowitz, CEO of SeeClickFix, likes to say that "potholes are the gateway drug for civic engagement."[1] If OpenPlans has its way, it'll be true for bike racks, too.

Contributing editor Steven Johnson (stevenbjohnson@stevenbjohnson.com) is the author of Where Good Ideas Come From, published in October by Riverhead.

Note 1. The original version of this story attributed this quote to Philip Ashlock, when in fact he was quoting Berkowitz.

VIEW COMMENTS