

## **Connecting Technologies to Citizenship**

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## Introduction

This white paper provides a broad overview of the theme, “connecting technologies to citizenship,” for readers that include academics, public intellectuals, policy officials, policy analysts, managers, and elected council members and mayors. In the paper I report the results of a survey of recent work ranging across relevant, practical empirical studies and promising practices. In the sections that follow, I draw inferences and conclusions from the collection of experiences and analysis available, although many trends and practices are just emerging, and highlight innovative or “tried and true” policies and practices that cities and metropolitan regions might consider going forward. Given the topic one should say at the outset that while digital technologies and social media have enormous promise in many areas of social, economic and political life, they may have little influence on some of the most intractable problems that cities face. In particular, unless people devote themselves to the task, these technologies may do little, for example, to change the “structures that reinforce poverty.”<sup>1</sup> This paper focuses on technology but does not intend to portray it as a panacea.

Among the key topics addressed in this white paper are the following: First, what is the state of connection between citizen and governments? Second, how does technology change and influence core elements of city government from the nature of governance itself to the challenges of service delivery to prospects for political participation and deepening citizenship? Third, and last, how are government services and information providers, brokers and decision makers in city government taking advantage of appropriate technologies to better meet citizen needs and demands?

## The State of the Connection between Citizen and Government

In looking across the State of the City speeches delivered by mayors in 2013, one finds that these leaders emphasize the importance of strong and healthy communities relying on creativity, trust, and transparency to be achieved in part through building strong partnerships.<sup>2</sup> At the annual conference this year of the International City and County Management Association, the theme of that meeting built on the enduring legacy of “reinventing government”—during its twentieth anniversary—and re-emphasized the significance for cities of a clear and well-defined mission, an orientation toward results and outcomes and a focus on citizens.<sup>3</sup> Both national meetings cast their prescriptive advice in the context of continued economic constraints; immigration, aging and other sources of fundamental demographic change; serious and growing disparities between the poor and the wealthy and the dangers of indifference to that gap; and, not least, the potential and challenges of pervasive and powerful technologies.

Transparency has risen to the high priority list of goals.<sup>4</sup> But transparency produces multiple effects. Transparency makes governments accountable. But it is also a precursor to engagement. While it cannot solve economic problems, opening the books and inviting

individual and corporate citizens to understand more about flows of money and decision making in city budgets is necessary to meaningful collaboration, engagement and partnerships. Moreover, calls for transparency provide an occasion for agency managers to work with their staffs to examine their data and results more analytically with a view toward evidence-based policymaking and management. To this end, transparency efforts, including open data, in agencies have become a critical pre-requisite for citizen participation, productive partnerships and more analytical, data driven approaches to city management.

Advances in technology also produce cross cutting implications for cities. An astute observer of city management noted recently:

We now have the ability to contact nearly every household multiple times a day to encourage community engagement and help frame conversations around service delivery. At the same time, we no longer can control those conversations. Social media is accessible by people of both good and bad intent, and we ignore it at our peril. Meanwhile, the potential of "big data" is enormous, enabling us to amass large amounts of information that will afford us greater transparency and accountability and give local officials an opportunity to partner with many different stakeholders.<sup>5</sup>

Clear mission and a focused vision are at the core of public management. When resources are constrained, sustained focus on high-priority areas and discipline in maintaining that focus increase in importance. Added emphasis on performance management and measures can help when metrics measure strategic priorities and not simply items easily measured. Change takes time and sustained effort so strong and stable leadership is key.

Although trust in government may be at all-time low levels, trust in local government is typically higher than it is for larger aggregates. This trust is part of the social glue that ensures commitment and mobilization of a city toward positive change and underlies technology-oriented innovations as importantly as innovation in other domains. A demanding economic environment forces city governments to put aside, to discontinue programs and methods that are no longer relevant or working. New forms of budgeting, participation and operations invite – and force – strong city governments to innovate, an essentially risky business of leaving old and comfortable routines and building new ones better suited to contemporary demands. These basics of public management are introduced here because they form the context in which technology projects are most likely to succeed and because information and communication technologies are part of most innovations in city government.

Technology cannot substitute for trust – or for strong city leadership and management -- but it can help to build and sustain it by enabling transparency, communication and coordination. In Salt Lake City, Utah, officials and experts examined the possibilities for using crowdfunding to attract start-up funds for emerging technology companies. Shared data and processes underlie implementation multijurisdictional business licensing in Henderson, Nevada and harmonization of city and county code services offices in

Wichita, Kansas enabling their consolidation. Durham, N.C. has developed a coordinated strategy to address and help “disconnected youth” by positioning them to become contributing members of the community by age 25. Part of this effort relies on using technology to connect the key stakeholders in the ecosystem of organizations that assist youth. While public schools and non-profits operate programs, the constellation of opportunities has been fragmented presenting an opportunity for professional and technical networks to share mission and operations.<sup>6</sup>

## **The Persistence of the Digital and Democratic Divide**

The digital divide remains a challenge for many cities.<sup>7</sup> After 20 years of the Internet and web it is clear that the digital divide will not self-correct. Recent focus on Internet navigation skills and those who actively use the Web for political information gathering and communication versus those who do not provides troubling evidence of the persistence of the digital divide and its morphing into a more troubling “democratic divide.”<sup>8</sup>

Karen Mossberger and her co-researchers wrote recently:

In an age when the United Nations has declared access to the Internet a human right, and universal access to high-speed broadband is a national goal urban areas have been largely ignored by federal [broadband or digital access] policy. Federal policies have focused on rural infrastructure. Yet, the U.S. is a metropolitan nation, and urban applications offer unparalleled advantages for addressing both innovation and inequalities in broadband access. This neglect may result in the failure to realize the social benefits of broadband and a broadly connected digital society.<sup>9</sup>

The National Broadband Plan is a broad framework developed by the Federal Communications Commission (FCC) at the direction of Congress and through extensive public consultation. The Plan did not include any funding for broadband initiatives. According to the FCC the Plan is meant:

to ensure every American has “access to broadband capability.” Congress also required that this plan include a detailed strategy for achieving affordability and maximizing use of broadband to advance “consumer welfare, civic participation, public safety and homeland security, community development, health care delivery, energy independence and efficiency, education, employee training, private sector investment, entrepreneurial activity, job creation and economic growth, and other national purposes.”<sup>10</sup>

Two programs federally funded at \$7.2 billion under the American Recovery and Reinvestment Act of 2009 (ARRA) (P.L. 111–5) were designed to fund a series of projects meant to build out the nation’s broadband infrastructure and to improve broadband access: the Broadband Technology Opportunity Program (BTOP) and the Broadband Initiatives Program (BIC).<sup>11</sup> The programs focused on under-served

communities to help them overcome distance and technology barriers by increasing connectivity.<sup>12</sup> The BTOP includes three programs – Sustainable Broadband Adoption (SBA), Public Computer Centers (PCC), Comprehensive Community Infrastructure (CCI). The SBA and PCC focused on stimulating demand, through increasing adoption and usage (particularly among vulnerable communities) and building access in public places, or “community anchor institutions.”<sup>13</sup> The CCI built broadband infrastructure. Most of the projects developed using this ARRA funding were middle mile projects, which by definition connect population centers to each other over rural areas. For example, in Illinois, the Illinois Century Network connects urban networks together, and connects rural-serving networks to urban centers by design to improve overall network performance by adding path diversity to Internet providers in Chicago, St. Louis and Indianapolis. In this way, funding ostensibly directed toward rural projects assists urban areas as well.<sup>14</sup>

Technological innovations and the benefits of social networks online do not reach those without access and digital literacy. Where access exists in cities, often the cost is a key challenge keeping low-income individuals and minorities from adequate broadband access. Moreover, the quality of broadband access is often suboptimal in low-income urban neighborhoods.

Some researchers have claimed that national broadband policies and, specifically, the National Broadband Plan, have discounted the importance of cities. The argument is that market provision of broadband has priced many of the urban poor out of the market or provided suboptimal connection speeds. Most city governments cannot provide adequate access without federal support. They argue that rural broadband access is important, but many more citizens are left behind in under-served cities. Moreover, analysis of usage patterns by some researchers shows that rural provision of broadband tends to supply those with better education and income. Both within and across cities, barriers to access differ across low-income and minority communities suggesting the importance of community-based analysis and tools.

The high population density of cities is well aligned to produce economic and social benefits from broadband. In fact, lower income earners might have the most to gain from robust broadband access but are more likely to suffer from inadequate access. For these reasons, some researchers argue that policies that are better aligned with the potential of cities would yield proportionately higher benefit for the country than those focused on rural areas.

Racial and ethnic disparities in access are glaring and persistent. Nationally, while only 65 percent of all Americans in 2010 had access adequate to produce digital citizenship, about half of American minorities are either not at all or poorly connected to the Internet and digital resources and communication. Lower income individuals face poor as well as unaffordable access. Moreover, individuals require exposure to training and programs to build digital literacy. Urban Latinos are the most disadvantaged technologically according to recent research. It is not only broadband access that is important but digital literacy and familiarity that are needed for individuals to use the Internet to seek jobs,

search for health information, gain access to education resources and to participate politically online.

Many observers and policymakers point to the rise of smart phones and other mobile devices as the progenitors of Gov 2.0, in which social media and user-generated content, produced primarily on mobile devices, eclipses the more traditional focus on information and communication technologies (ICT) and e-government. While many households include laptop and other computers as well as individuals using smart phones, data indicate that about four percent of the U.S. population uses cell phones as the primary means to access the Internet. These users tend to be African-Americans and Latinos with low education and income levels. Recent analysis indicates that “mobile-only Internet users have dramatically lower levels of online activity and skill ... [fostering] a second-class form of access, affecting many minorities and urban poor.”<sup>15</sup> Contrary to claims of m-government or mobile access replacing broadband access from the home, these users tend to exhibit lower digital literacy and tend not to use the Internet in ways that might enhance their economic, educational and political prospects.

Thus, while city governments should build channels for interaction through mobile phones, these are unlikely to reverse the digital divide and may exacerbate it. Digital citizenship means using e-government and related information and services to improve prospects for education, economic well-being, health and political participation.<sup>16</sup> Individuals need home access to broadband to build such skill through sustained use and to support their full participation in social, economic, and political affairs.

The top 50 U.S. cities in terms of population vary enormously along several dimensions. City cores differ from their suburbs in the metropolitan area. Within cities, neighborhoods vary substantially. Research shows that even the most digitally innovative and advanced cities find provision of broadband for all a challenge. Researchers using spatial information have begun to map the geography of technological opportunity, connection and use at the neighborhood level. They find that neighborhood-level characteristics – such as the availability of affordable, high quality broadband access in a neighborhood – influence economic, social and political representation, for example, the ability to use a city’s website to access services and to interact and coordinate citizen participation, to access political information from local officials and other citizens, and similar online behavior. Mobilization at the neighborhood level requires connectivity. These findings demonstrate that individual-level differences in digital literacy should be viewed in the context of neighborhood-level attributes.

What should cities do about these persistent disparities? Mossberger, Tolbert and Franko recommend that city officials across the country work together to change federal policies so that they reflect what city’s need. Digital access and use should be analyzed at the level of the neighborhood in cities with programs for innovation and improvement focused on what works in particular types of neighborhoods. For example, research shows that the dimensions of use are different in low-income predominantly Latino neighborhoods versus primarily low-income African American neighborhoods. Programs that work must respond to actual patterns of use. Finally, it is clear that market provision

of broadband access will not respond to geographic areas that are deemed uncompetitive or good for business. In these areas, other options will be needed to influence price and accessibility.

## Services for Citizens

An increasing number of cities offer “Web portals and online services, including the ability to pay utility bills, parking tickets, and taxes; to apply for building permits, license renewals, and jobs with the city; and to register property.”<sup>17</sup> Key performance measures for provision of these types of services are convenience, cost of system operations and maintenance, and security. Cities are developing capacity to conduct such transactions over mobile phones and other devices. Provision through more channels introduces potentially new efficiencies and convenience for citizens, but cost of operations and security are a concern for city managers.

A review of recent research on the implementation of these technologies in cities across the country yields a useful starting point for comparing digital governance in 2013.<sup>18</sup> Research evaluating the municipal websites of Washington D.C. and the two largest cities in each state compared cities using 104 measures of digital governance across five broad categories: content; services; usability; engagement; and privacy and security. Based on this survey, the top ten cities for digital governance, averaging across the measurement categories, are Seattle, St. Paul, Milwaukee, Minneapolis, Washington D.C., Portland, St. Louis, Virginia Beach, Boston, and Fort Smith, Arkansas.<sup>19</sup> Digital governance scores for all of the cities surveyed increased from 2008 to 2010-11. Midwestern cities consistently outscored their counterparts in the West, South, and Northeast. Citizen and social engagement formed the weakest category for most cities.<sup>20</sup> The low score “can be attributed to the lack of support for interactive online citizen participation practices among municipalities.” Although 80 percent of surveyed cities “provide one-way communication to the public via social media, it is unclear whether they allow citizens to communicate with elected officials using this feature.”<sup>21</sup> Yet although citizen engagement is still weaker than other measures, it has seen the highest increase from 2008 to 2010-11.

Why do some municipal governments adopt ICT policies to enable e-government and online services while others do not? What are the factors that explain variance in behavior and outcomes across municipal government?<sup>22</sup> Institutional developments that place IT expertise—either a chief information officer or a chief technology officer—within a mayor’s executive group with participation in strategic developments are critical. An appropriate combination of centralization of some systems and standards with decentralization of agency and program level tools and capacity is important as well. Researchers have observed that “managerial innovation orientation” in a range of policy areas is related to innovation in e-government.<sup>23</sup> The optimistic view of e-government adoption in cities entails the following narrative. Interactive government websites become “standard operating procedure.” Citizens expect digital services and interaction. E-government is transformative and able to markedly improve service delivery and public participation of citizens and business thereby increasing efficiency, effectiveness, transparency and democratic processes related to participation and interaction.<sup>24</sup> The

challenges that cities face in this narrative include the digital divide manifested in lack of access to broadband connections and lack of digital literacy; lack of budgetary resources to develop, maintain and manage digital sites and services; and resistance by program managers and others to new practices and processes implied by use of new digital government applications and platforms.

## **Social Media, Civic Technologies and Open Data**

Social media use has burgeoned since the advent of Facebook, Twitter, smart phones and other platforms and tools that encourage social communication and user-generated content including visual information. Recent studies suggest that despite widespread implementation of social media networks on city websites it is unclear whether the early use of social media in cities has enhanced communication or governance.<sup>25</sup> According to the results of a survey measuring the percentage of city government websites using social media among the 75 most populous U.S. cities, between 2009 and 2011 use of Twitter increased from 25.3 to 86.7 percent, use of Facebook grew from 13.3 to 86.7 percent, and the proportion of city websites using YouTube jumped from 16 to 74.7 percent. The fact that there is little cost to cities to use these social media sites and given that they can be easily placed on city government websites, it is not surprising to see such rapid uptake. However, despite this increase the researchers note that “city websites have in the past provided little for two-way interactions” and question the efficacy of these new social networks to engender online participation in governance and contributions to policy formation.<sup>26</sup>

In spite of weak levels of deliberation and political participation on social media in city websites, many experts are optimistic about the potential of social media to deepen citizenship and democratic participation. The availability of web 2.0 platforms and applications, in particular, those using social media, have influenced greater use of tools with the potential to promote direct democracy and representation online.<sup>27</sup> Cities can “extend the public space [to build] consultation and dialogue between citizens and their governments.”<sup>28</sup>

Some scholars suggest that the usefulness and effectiveness of employing web 2.0 platforms will rely on increasing transparency between citizen deliberation on such platforms and eventual policy outcomes.<sup>29</sup> In most governments the actual “decision making process for ultimately adopting a policy still remains opaque,” and, according to some digital government experts, the success of implementing web 2.0 technologies for governance will rely on the extent to which citizens can expect their comments and online interactions to matter in policy outcomes.<sup>30</sup> Cultivating this level of expectation, which derives from citizens’ beliefs in the legitimacy of the forum that they are participating in as well as their clear understanding of the criteria by which their input will be evaluated in the policy formation process, is key.

### **311: How Civic are “Civic Technologies”?**



Social media and the potential to build applications using publicly available data have been the catalysts for an emerging industry of firms and non-profits that develop, disseminate and manage what are often called “civic technologies.” It is important to be clear about what it is these systems actually do because the language used to describe them tends to obscure their actual functions. The language of Gov 2.0 and civic technologies is rife with hyperbole, utopian language and promises of deeper democracy, engaged citizens, accountable governments and empowerment for all at low cost. While this ecology of tools offer considerable power, city managers and officials need to thoroughly examine promises to estimate costs and expected outcomes. Moreover, they need to examine who will own and control public information and data, what the true costs of a revenue sharing contract entail, and how stable the support for a system is likely to be. A final decision for city managers is whether to use proprietary systems or open source systems. For these types of decisions, competent IT managers are critical.

### ***Popular Open Source Civic Technologies***

Open source means that the source code, the software, is “open” or available for those with coding expertise to examine and modify. Open source systems and applications often are developed by communities of developers with the source code remaining open for improvement, troubleshooting, and refinements.

Open source software is an alternative to proprietary software often generating substantial savings for governments and much more flexibility in customizing and adapting software. The most visible example is the WhiteHouse.gov website which was the first major open source federal government site. Many other federal sites are open source. Some state and local governments have used open source for many years prior to the Obama Administration’s embrace of open source. Thus, a considerable base of knowledge and experience has accrued for open source system use in government.

City governments that would like to use such tools to increase transparency, service responsiveness and civic engagement have a variety of open source tools and platforms available. The benefits of open source are low cost, easy adaptation and avoidance of “lock in” to long-term contracts and upgrades.

Below are several brief examples of widely disseminated systems and recent apps that have received high visibility. Ten open source tools<sup>31</sup> recommended for cities include:

- **CitySourced** – a reporting tool to assist people in reporting civic issues including public safety and environmental issues
- **FixMyStreet** – an open source app that allows people to report issues related to street
- **OpenPlans** – typically used in larger cities, these planning and transportation tools can be adapted to smaller cities
- **Electorate.Me** – a website for people to exercise voice in political and social affairs

- **NationBuilder** – a group of open source tools for communities including maps, surveys, and updates to facilitate interaction between agencies and individuals
- **OpenPublic** – an affordable content management system for cities to use in outreach to the public
- **Open311** – a reporting and tracking system for civic issues
- **Granicus** – provides cloud storage for media and a suite of tools to broadcast and manage media online
- **SeeClickFix** – a reporting tool that has been expanded to include workflow management, reporting and other tools for non-emergency service management
- **Open City** – volunteers who develop apps at the request of cities

### **311 Digital Hubs**

A 3-1-1 telephone number is one version of an N-1-1 special number (for example, 9-1-1 for emergency calls) used in many U.S. communities to connect citizens to non-emergency government services through one, central phone number typically directed to a call center or dispatcher. It was originally developed to decrease non-emergency calls to 9-1-1 emergency lines. The original 311 telephone-based systems, built before the Internet, were implemented independently across city governments as standalone efforts lacking interoperability.<sup>32</sup>

The Open311 platform uses open source software to make innovations developed in one city using Open311 available to other cities. As one developer observed: “By adopting the Open311 API [application programming interface] for exposing civic data, cities are enabling civic developers like myself to build reusable tools and apps. To access data from 30 cities, [my app] doesn’t need an adapter for each individual city, only a server URL that it can expect to interact and deliver data in the same way as described by the Open311 API documentation.”<sup>33</sup> Indeed, since its launch in 2010 and influenced by IT officials in the Obama Administration to build apps that can be used in any city, Open311 has been implemented in more than 30 cities globally and has catalyzed an array of apps and services.

Originally developed in Baltimore in 1996 and expanded to become Citistat – a fully developed reporting, tracking, analysis and management framework -- contemporary Open311 digital hubs build on the concepts of a one-stop shop; responsiveness to citizens; and calls for transparency and performance management by recording, tracking, mapping and using data to analyze demand and response patterns for city services using temporal and geo-spatial data. The primary efficiency gain in most implementations is the routing of all non-emergency calls to city departments and units through one number. Many, but not all, large U.S. cities have 311 capability. A recent article lists 50 U.S. cities using 311 systems.<sup>34</sup>

The City of Chicago launched its first 311 system in 1999. Chicago 311 has won several awards including the Innovations in American Government award from the Kennedy School of Government in 2003. In fact, the 311 call center in Chicago backs up the 911 call center.

The New York City 311 site – NYC311 -- describes itself as the “main source of government information and non-emergency services ... just a click, text, or call away.” The New York City 311 hub maintains an active social media presence with most elements of the hub on social media platforms such as Facebook and Twitter. The City of New York, following the Citistat model, uses information from 311 calls for performance measurement tracking demand for services, response times and other key metrics. New York was an originator of Compstat, a precursor to Citistat, in the New York City Police Department, an initiative that required police precincts to track, categorize and map crime and to deploy police based on precinct-level data. Frequent review meetings with the Chief of Police and his staff were used to review data and precinct-level efforts to improve performance in response to their data and using it to measure effectiveness. NYC 311 extends the performance management tools to the range of non-emergency services managed by the city and extends the use of 311 to other categories including events, public health and other information-based issues.

Kansas City’s 311 hub similarly allows residents to interact with government via social media to help maintain city infrastructure and locate problems that would otherwise require significant outlays. Both hubs use Twitter, as well as other communication channels, to allow people to report problems and follow the status of their filing online. By using social media to crowdsource problems such as graffiti or potholes these municipalities are able to address citizen concerns while both bettering infrastructure and saving money.<sup>35</sup>

Careful analysis of calls and complaints provides a vector for analyzing city services demand and response.<sup>36</sup> This analysis is useful under normal operating conditions as well as during emergencies. New York City received record high calls to its 311 number on the first day of a transit strike in 2005. In Orange County, Florida, the 311 system was in the pilot phase when three hurricanes struck Central Florida. The 311 number received more calls than any other leading the county to implement the system fully.

The growth of Open311 raises questions about standardization of civic technologies, so called, across state and local governments. While standardization across 311 and other platforms continues to increase across states, it is important to preserve diversity to keep state governments, “the laboratories of democracy,” as Justice Brandeis called them, adapting to change according to their own lights.<sup>37</sup> Open and proprietary 311 systems do not, on their own, reduce digital divide or foster citizen participation and deliberation. But they offer low-cost, powerful communication routing, workflow management and performance measurement through tracking and mapping.

Not surprisingly, by making enormous amounts of potentially valuable information available (e.g., calls to municipal governments and public databases) a small industry of firms and non-profit organizations such as SeeClickFix, Inc. and others has emerged quickly. The primary revenue source is advertising. A secondary and growing revenue source is assistance to cities in managing increasingly complex back-end analytical, reporting and other management systems. So it may be that cities are enticed by the low

cost of the initial Open311 offering and then find themselves virtually locked-in to a portfolio of management systems and tools that are not cost-free. Young firms in this space are developing civic technologies to delegate to and integrate across agencies and policy areas, across various communication channels (phone, text, email, etc.).

### ***Distributional Biases and Use of 311***

Coproduction of city services is one of the promises of 311 and related services. While co-production originally was tried in early efforts by public managers in the 1970s and 1980s, initiatives to outsource and privatize some city services took precedence over attention to coproduction.<sup>38</sup> Similarly, customer relationship management systems, or CRM systems, have given way terminologically to “civic technologies” or 311 systems although the underlying frameworks and technological systems are highly similar. Citizens are considered co-producers in these models when they identify and report non-emergency problems such as fallen trees, abandoned cars, trash that has not been picked up, stray animals, and other municipal phenomena. Recent research finds little cause for concern that neighborhood level inequalities, a reflection of deeper racial, ethnic, income and inequalities might be exacerbated by systems that heighten response to those who complain or report while possibly neglecting response to those who do not. The important exception, however, are Hispanics. A study of the Boston 311 system and its use from 2010 to 2011 found that race, education and income disparities were not present in an analysis of 311 calls. But the researchers found that Hispanics “may use these systems less as requests move from call centers to the Internet and smartphones. The study also found that poorer neighborhoods are less likely to use 311 services except for the case of smartphone use for reporting problems. Thus, the researchers conclude that smartphone use may help to bridge the digital divide, at least in the area of citizen coproduction for routine, well-structured and easily measured city services. However, this use apps to make 311 calls does not meet the criteria established for digital citizenship, a term that suggests a much higher level of digital literacy and interaction with economic, health and government content.

Whether citizenship is deepened by such reporting, and if so, how it is influenced, remains to be analyzed. The term “transformation” is over-used in this context as in memes that suggest that cities have been transformed or that citizens have been transformed by reporting potholes and other problems and by tracking repair schedules and completion.

### ***SeeClickFix, Inc.***

SeeClickFix is a firm that has developed for the market one of several toolkits that work in connection with 311 services. SeeClickFix is a private firm that offers a communications platform for reporting non-emergency problems, for governments to track and manage such reports and to reply to citizens who post on the site. Citizens or groups report problems using mobile phones so the information is tagged by date, time and geographic location. Those who report problems often send photos. SeeClickFix has developed mobile applications for reporting and a mobile platform that the firm will

customize for a city to their specifications. They offer dashboards, mapping tools, report generation and communication tools to offer dynamic “geo-based city notification tools” for municipal governments. Problems reported by citizens or others can be responded to with automated messages, routed to the appropriate departments and used to create work orders and workflow management. The firm has partnered with several software firms including Open311, Cityworks, Microsoft Dynamics and others to order and map workflows for municipal non-emergency problems.<sup>39</sup>

Originally, SeeClickFix sought to sustain their business with fees from advertising. In an August 2011 interview the firm’s founder, Ben Berkowitz, notes 800 local news sites as partners. The basic “widget” for SeeClickFix is free with revenues for partners generated by selling ads. The firm also offers an ad-free widget to cities. In January 2011, the firm received \$1.5 million from Omidyar Network and O’Reilly AlphaTech Ventures in equity funding. They quickly progressed to helping cities manage their 311 customer-response systems, an additional source of revenue that ranges from \$1200 to \$20,000 per year depending upon city size and complexity. In 2011 the firm had about 60 clients including Philadelphia, Washington, D.C., New Haven, Hartford, Richmond, and Raleigh.<sup>40</sup> Albuquerque, NM launched the SeeClickFix platform and tools in April 2013. The firm claims that once the city has received 6,000 reports of problems, the program, which cost \$13,000, will have paid for itself. They note that Los Angeles recently paid \$150,000 for a similar system.

Ben Berkowitz, the firm’s founder, claims that simple civic engagement, for example, reporting a pot hole that requires repair, may lead to deeper forms of engagement. His pithy phrase: “Potholes are the gateway drug to civic engagement” encapsulates the view that people find their own uses for technological tools and may use them in surprising ways not envisioned by their developers. Having the ability to report a problem and to see it resolved may be empowering for citizens. Similarly, local networks of civically engaged individuals use SeeClickFix as a platform to coordinate their community efforts and to communicate with government in a public venue where requests and responses are tracked. Use of the platform and the communications it can facilitate have the potential to build trust not only from citizens to the government, but from the government back to the citizens during the course of many neighborhood projects.<sup>41</sup>

SeeClickFix is partnered with 55 municipalities in and around Boston. During the day after the Boston Marathon bombings, users of the site decided to post online if someone had a home available for people who needed a place to stay after the Boston bombing. Two hours later, 750 people had posted their homes in the Boston area as places for those to stay who had been dislocated by the bombing. During severe winter storms, people have coordinated online using SeeClickFix to help one another to shovel out. Berkowitz summarizes this phenomenon by relating ease of peer-to-peer communication to helpfulness: “Local connectivity increases neighborliness exponentially.”

### ***Code for America***

Code for America presents another opportunity for city governments to gain technology capacity through civic technologies and voluntarism. It is the best known and probably the largest of a growing number of volunteer programs by which software developers donate time to help governments, typically by spending a year as part of a team working with a city government. Code for America is modeled after Teach for America, a volunteer program that places college graduates into inner city school systems typically for a year of teaching. Many web development experts would like to engage with governments to have impact. One of the founders of the organization noted: “It’s been this vending machine model where you put your money in and get your services out. Now ... you look at government as a platform and instead of shouting at the machine you get involved and start to make the change happen that you want to see. You’re not just buying services, you are participating in the solution to the problem. These people have a passion to try to fix the country.”<sup>42</sup>

## **Open Data**

Civic technologies rely on public data to use transparency to increase accountability. To that end many cities have begun removing barriers to transparency by generating open data, that is, open government databases, available for public use. Mossberger and Wu found open data sites in only a dozen of the 75 largest cities by the summer of 2011, and noted that although “open data portals can promote transparency, their significance over time will depend on what data are made available, and the extent to which it is usable for intended audiences.”<sup>43</sup>

Cities such as New York, Chicago, Seattle, and Boston have implemented open data portals as part of their digital governance strategies. On the New York City government website “over 750 datasets are available for free ... from nearly 40 City agencies, including public safety data, buildings complaints, restaurant inspections and real-time traffic numbers.”<sup>44</sup>

The cities of New York, Chicago, Seattle, and San Francisco have begun to compile their municipal data together on the website [cities.data.gov](http://cities.data.gov). By sharing municipal data across the United States “this initiative promotes transparency in government while providing developers and the public with standardized data which is needed to build applications that will work across different communities. Although it is not part of this shared open data project, Boston has made data regarding its city reports, city information, and citizen requests for service available on its city government website. These data can be easily overlaid on a map of the City of Boston to provide citizens with a visual representation of data.

### ***San Francisco***

San Francisco has developed an expansive open data portal, which allows a developer to use public data to create apps in order to enhance public services.<sup>45</sup> This open data portal includes 200 data sets.<sup>46</sup> The apps enhance communication, city services, and other important functions of governance. This portal has already engendered innovations

including the development of the SFpark app which provides commuters and drivers in the city with the latest information regarding available parking in the city as well as current rates for parking. It uses market and demand information to adjust parking prices once a month in order to ensure the most competitive prices are available in each area of the city. This allows commuters to plan their travel and to cut down on traffic at peak times of the day.

Development of web 2.0 technologies such as these suggests the usefulness and potential for wide spread development of open data portals at the municipal level. But it remains to be seen whether citizen- and business-generated apps will address some of the more intractable problems of cities and will help redress social and economic inequalities.

### ***Citizens Connect: Boston***

Additionally, moving beyond filling potholes Boston has developed the Citizens Connect app which allows users to report graffiti potholes and other blemishes within the city that need correcting. The website pronounces: "Citizens Connect is the City of Boston's award-winning effort to empower residents to be the City's "eyes and ears." Now you can alert the City of Boston to neighborhood issues such as potholes, damaged signs, and graffiti." In addition to being able to report these issues via tweet, text, or the app it also allows users to view other reports made by searching the report type or map.<sup>47</sup>

Boston has implemented Citizens Connect on its website, a digital information and city services platform designed to initiate stronger citizen to government communication and help streamline citizens' access to city services and information. This platform was implemented by the Mayor's Office of Constituent Services and allows users to easily find online city resources; access city services and information; pay city utility bills, taxes, and fines such as parking tickets; and report issues with city services or problems in the city like potholes or graffiti. It also allows citizens to request a variety of license renewals, search job postings, register animals, request city services like street cleanings, or access city information such as the city's Restaurant Health Ratings. The Citizens Connect platform also organizes all of these services and resources in one user-friendly page incorporated as part of the city website. The Citizens Connect platform includes an online live chat component called Citizens Connect Live that "allows constituents to chat online with operators staffed by the Mayor's Office of Constituent Service ...[who] ... are available to answer questions about city services or direct users to online services or web resources."<sup>48</sup>

Citizens Connect is also available to city residents as a mobile app. This app is mainly geared toward crowdsourcing rehabilitation efforts of city streets. It allows users to report damage such as potholes, graffiti, or damaged street signs by uploading a photo with a short description of the problem and its location. Residents may use Twitter to report problems by tweeting a picture and location while using designated tagging phrases such as "#sign." Once a report is generated its status can be followed until city officials fix the problem. Citizens also have the ability to share the report with their peers via social media sites like Twitter. Additionally, this app allows other users to search submitted reports by map location or the image or type of report submitted. This allows for both

citizen-to-citizen interaction and facilitates citizen-to-government interaction that many observers find lacking in web 2.0 implementations at the city level.

### **Commonwealth Connect**

In June 2013 the City of Boston and SeeClickFix announced the launch of the Commonwealth Connect App.<sup>49</sup> This app has been so successful in Boston that it has been expanded into a broader statewide program called Commonwealth Connect which allows 54 cities and towns in Massachusetts to use the platform and develop similar strategies to streamline citizen access to city or town services and resources while also allowing citizens to interact with the local government to help report problems such as damage to city streets.

Boston has taken other steps to implement web 2.0 technologies in order to increase the effectiveness of city services. In addition to the Citizen Connect mobile app which allows citizens to manually report issues such as potholes or graffiti, the city has also developed a mobile app called

### **JustRide**

Boston was recognized by the National Association of State Chief Information Officers (NASCIO) for its efforts in mobile ticketing for the Mass Bay Transit Authority (MBTA) commuter rail and ferry services. A physical extension of metropolitan Boston's currently used CharlieCard ticket selling infrastructure would have cost \$70 million dollars. By taking advantage of mobile phones however the MBTA was able to deliver the same service at a lower price. The MBTA partnered with Masabi, an award-winning British company that specializes in mobile ticketing (mTicketing) for transportation systems, to produce the JustRide app which allows users to purchase tickets on their mobile devices that are easily recognizable by on-board staff. The MBTA paid for the system using a revenue sharing model where Masabi receives 2.8 percent of all tickets it sells for the first year. This project is innovative because it saves taxpayers money while providing solutions that work seamlessly with current uses of social technology.<sup>50</sup>

### **StreetBump**

The City of Boston Mayor's Office of New Urban Mechanics has implemented an app that automatically senses bumps identified and located through a cell phone's accelerometer and its GPS system. This app does not require an individual to record and report a problem; the app senses the bump and communicates it to the Open311 system. The Mayor's Office of New Urban Mechanics partnered with the firms Connected Bits; IDEO; InnoCentive and Professor Fabio Carrera of the Worcester Polytechnic Institute. The Mayor's Office has promised to make the app available to other cities. It is interoperable on the Open311 system.

The Office of Urban Mechanics is part of the Mayor of Boston's office, established in 2010, and more recently became of the Office of the Mayor of Philadelphia. New urban



mechanics is an innovation lab focused on urban innovations to help cities primarily through the use of civic technologies, collaboration with constituents and neighborhood programs.

## **Deliberation: the Virtual Town Hall**

Cities have implemented online forums since the early 1990s to engage citizens in deliberative discussions regarding public policies and issues affecting whole communities. These efforts began with online bulletin boards and listservs and have modernized as technologies have advanced. Yet only six cities among the 75 largest U.S. cities in Mossberger and Wu's 2011 study have incorporated a virtual town hall platform into the city website in order to facilitate civic participation online. While citizens may find many other ways to engage in deliberation – for example, through social media in neighborhood, community or interest-based deliberations -- some view the virtual town hall, a city-wide site for deliberation (and not simply for reporting complaints and problems) to be one of the more important potential developments of digital governance. Although many researchers encourage city managers to develop such deliberation, relatively little is known about how best to manage such interactions, who participates and with what results.

Virginia Beach, Virginia has implemented a virtual town hall portal that allows users to interact online with each other as well as with government officials to deliberate on public policies.<sup>51</sup> Using the platform, registered citizens can provide commentary, input, and other suggestions for different laws and issues in the community. The site was developed and is managed by Peak Democracy, a firm that developed the Open Town Hall. Users of the site must enter their name and address, which are kept private, but used to moderate and maintain control of interactions and posting. Peak Democracy has developed analytical and reporting tools to track geography and demography of those using the site. The firm reports that it has worked with more than 50 government agencies. They report that local governments have implemented 1,202 open town hall forums to date and list cities including Norfolk, Virginia; Salt Lake City; Santa Clara; Delray Beach, Florida; Decatur, Georgia; Tempe, Arizona; Aspen, Colorado; Saint Paul, Minnesota; Tulsa, Oklahoma; Ann Arbor, Michigan; and Tyler, Texas, among others..

## **Emergency Management and Policing**

The use of digital platforms by city police forces and local emergency management agencies has grown enormously following September 11, recent natural disasters and the revolution in social media and big data. According to a study conducted by the Congressional Research Service, the use of web 2.0 technologies to enhance emergency response is currently implemented similarly to other web 2.0 technologies in cities: primarily as one-way passive information dissemination vehicles but with the ability to receive messages, wall posts and responses to polls from citizens. This is the modal use by city governments as well as by FEMA. However, the potential of social media use in disaster and emergency management includes “using the medium to conduct emergency

communications and issue warnings; using social media to receive victim requests for assistance; monitoring user activities and postings to establish situational awareness; and using uploaded images to create damage estimates, among others.”<sup>52</sup> Indeed, many developing countries already use such systems, originally developed by Ushahidi, a non-profit organization in Kenya.<sup>53</sup>

## **Next Door**

In the wake of recent disasters such as Hurricane Sandy cities such as New York have begun to implement social media platforms like Next Door, a private neighborhood-based social platform, that facilitates communication and exchange among neighbors. The small firm, Next Door, recently attracted \$60 million in venture capital, a sign of investor confidence in its potential. Cities have found neighborhood level social networks valuable during natural and other crises to facilitate government responses. This online social network has users sign up using their real name and address to access online forums specifically for their neighborhoods. This allows community members to acquaint themselves with one another and foster relationships and networks that can be activated in times of disaster or emergency.<sup>54</sup>

## **Seattle: Tweets by Beat**

The Seattle Police Department has established a social media presence that incorporates the use of Twitter as a type of digitized police scanner with tweets sent to alert citizens of police-dispatch calls and reports of crimes in their neighborhood in real time. This program, named “Tweets by Beat,” allows users to observe police dispatch calls in their neighborhood and stay informed in cases of emergency. The “Tweets by Beat” website: “The Seattle Police Department is making it easier than ever before for you to find out about crime happening in your neighborhood. With Tweets by Beat, you can follow or view a Twitter feed of police dispatches in each of Seattle’s 51 police beats, and find out about the flashing lights and sirens on your block.”<sup>55</sup>

Seattle, Palo Alto, Houston, and Kansas City, MO are examples of cities whose police departments have implemented social media into their communication strategies.<sup>56</sup>

## **The Enabling City: Making Co-Production Work**

Nancy Roberts defines “co-production” as a type of civic engagement:

Citizens and administrators cooperate with each other through neighborhood associations, community organizations, and other client groups to redesign and deliver government services. Their mutual goal is to improve the quality and quantity of service outputs. Citizen-agency collaborations in the production of services occur at all levels of government, but the most prevalent are at the local level. Coproduction has emerged as an attractive option during budget cutbacks,

mounting service demands, and stretched resources. Its virtue also lies in the creation of network ties that are essential for building strong communities and maintaining a healthy democratic system.<sup>57</sup>

Roberts brings together several strands of importance to cities grappling with new technological possibilities. When co-production works it uses the efficiencies and power of digital and social media platforms in the service of strengthening local and neighborhood communities.

Other experts on co-production have emphasized the importance of understanding citizens and their lives “deeply.” This “professional empathy” cannot be crowdsourced or gained from big data. But to design services and solutions, it is essential. It requires close interaction between city staff and neighborhood residents. Rather than hailing a technocratic approach by which technologies dominate, a more human approach – and, many would argue, are more effective approach -- extends co-production to the very design of services and policies. In design models that work, rapid pro-typing and iteration to improvement replace more traditional bureaucratic ideas that separate stakeholders, fragment problems, and locate expertise only with professionals. These developments in co-production are important because the Open311 models can function as complaint handling and workflow processing systems rather than as community development vehicles.<sup>58</sup> While the efficiency of 311 systems is part of their value, the close contact necessary to understand specific neighborhoods and their challenges, while inefficient because it is labor intensive, is vital to progress.

## **Recommendations**

1. Attend to the digital divide. Access to apps and 311 systems, while important, are unlikely to be sufficient to ensure digital citizenship. Examine neighborhood-level connectivity and develop neighborhood-level programs to ensure access and digital literacy.

2. How much interactivity do you have between your city and your citizens? How much do you want? Social media alone does not build deliberation and civic engagement although it offers effective platforms for starting such efforts. Government leaders must work with community groups to structure and promote deliberation. Participatory strategic planning is widely used. Participatory budgeting is gaining traction.

3. Assess civic technologies. While this ecology of tools offers considerable power and potential cost savings, city managers and officials should thoroughly examine estimated costs and expected outcomes. Vibrant and active communities of urban innovation labs, urban mechanics, civic technologies and similar groups should be part of the network of a city’s IT and social media staff. Benchmark against other cities and learn from useful practices. Ask who will own and control public information and data, what the true costs of a revenue sharing contract entail, and how stable the support for a system is likely to be. A major decision for city managers is whether to use proprietary or open source

systems. For these types of decisions, competent IT and social media managers are critical.

4. Take advantage of open source platforms and tools. Benchmark against comparable cities in terms of scale to find cases and sources of information.
5. Encourage the development of apps to address city service provision and seek out apps developed for other cities that may be used in your own city. Increasingly, these apps are gathered into dictionaries and available for wide sharing.
6. Disengage from first generation, expensive, proprietary workflow management systems when it is possible to do so to generate substantial cost savings and to simplify and streamline government services for citizens.
7. Generate feedback and dialogue among citizens. Most deliberation sites are moderated to control against capture by narrow interest groups. The best results seem to be achieved by specifying specific problem or policy areas to structure and focus discussion and by setting a timetable for the discussion and the expected results (ideas, a plan, a decision, opinions, etc.). Generating alternatives or discussion of the pros and cons of various alternatives can be highly useful for public managers.
8. Citizen co-production of services holds promise to increase trust and increased citizen engagement when governments can respond to requests for assistance. Technology alone will not build engagement or trust, but the platforms and tools can be useful catalysts and do provide powerful coordination assistance. Effective co-production requires face-to-face interaction at the neighborhood level to closely engage with what citizens need in their specific context.
9. Transparency is powerful. Citizens will continue to demand open data and more transparent processes in government.
10. Open platforms for citizen engagement are at risk of capture and distortion from narrow interest groups with intensive beliefs. Cities and city officials have a responsibility to ensure broad representation of perspectives and views.

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## Endnotes

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<sup>1</sup> This phrase is borrowed from Paul Farmer and Fr. Gustavo Gutiérrez. *In the Company of the Poor*. Maryknoll, NY: Orbis Books, 2013.

<sup>2</sup> Raksha Vasudevan. "Building for the Future in an Uncertain Present: State of the Cities 2013." CitiesSpeak.org, official blog of the National League of Cities, March 21, 2013. [citiesspeak.org/2013/03/21/building-for-the-future-in-an-uncertain-present-state-of-the-cities-2013/](http://citiesspeak.org/2013/03/21/building-for-the-future-in-an-uncertain-present-state-of-the-cities-2013/)

<sup>3</sup> Robert J. O'Neill, Jr. "Local Governments' Enduring Reinvention Imperative," *Governing*. October 30, 2013. [www.governing.com/columns/smart-mgmt/col-reinventing-government-book-osborne-gaebler-impact-local-innovation-principles.html](http://www.governing.com/columns/smart-mgmt/col-reinventing-government-book-osborne-gaebler-impact-local-innovation-principles.html)

<sup>4</sup> See, for example, Jon Gant and Nicol Turner-Lee, *Government Transparency: Six Strategies for More Open and Participatory Government*, the Aspen Institute Communications and Society Program, February 2011, available at [http://www.aspeninstitute.org/sites/default/files/content/docs/pubs/Government\\_Transparency\\_Six\\_Strategies.pdf](http://www.aspeninstitute.org/sites/default/files/content/docs/pubs/Government_Transparency_Six_Strategies.pdf). See also *Informing Communities: Sustaining Democracy in the Digital Age*, Knight Commission on the Information Needs of Communities in a Democracy, Aspen Institute, 2009.

<sup>5</sup> R. O'Neill, Jr. "Local government in an Era of Creative Destruction," *Governing*. May 1, 2013. [www.governing.com/columns/mgmt-insights/col-local-government-creative-destruction-challenges-leadership.html](http://www.governing.com/columns/mgmt-insights/col-local-government-creative-destruction-challenges-leadership.html)

<sup>6</sup> See Peter Coy, "The Kids are not Alright," *Bloomberg Businessweek*. February 7-13, 2011. "Disconnected Youth in the Triangle: An Ominous Problem Hidden in Plain Sight," a report to the North Carolina GlaxoSmithKline Foundation by MDC, Inc. August 2008, available at [www.mdcinc.org/sites/default/files/resources/disconnected-youth.pdf](http://www.mdcinc.org/sites/default/files/resources/disconnected-youth.pdf); related resources at MSCinc.org at [www.mdcinc.org/projects/disconnected-youth-triangle-ominous-problem-hidden-plain-sight](http://www.mdcinc.org/projects/disconnected-youth-triangle-ominous-problem-hidden-plain-sight); IBM Smarter Cities Challenge Durham report, no date. [durhamnc.gov/ich/cmo/Documents/ibm\\_scc\\_report.pdf](http://durhamnc.gov/ich/cmo/Documents/ibm_scc_report.pdf).

<sup>7</sup> This section on the digital divide in cities summarizes key findings of Karen Mossberger, Caroline Tolbert and William W. Franko, *Digital Cities*. Oxford University Press, 2013.

<sup>8</sup> Seong-Jae Min, "[From the Digital Divide to the Democratic Divide: Internet Skills, Political Interest, and the Second-Level Digital Divide in Political Internet Use](#)," *Journal of Information Technology and Politics*. Vol. 7, No. 1, 2010.

<sup>9</sup> Karen Mossberger, Caroline Tolbert and William W. Franko, *Digital Cities*. Oxford University Press, 2013.

<sup>10</sup> Quotation from the FCC, National Broadband Plan, Executive Summary, available at <http://www.broadband.gov/plan/executive-summary/>.

<sup>11</sup> For information concerning BTOP at the U.S. Department of Commerce National Telecommunications and Information Administration, see <http://www2.ntia.doc.gov/>. For information regarding BIP at the U.S. Department of Agriculture Rural Development Service see [http://www.rurdev.usda.gov/utp\\_bip.html](http://www.rurdev.usda.gov/utp_bip.html).

<sup>12</sup> See White House, "Vice President Biden Kicks Off \$7.2 Billion Recovery Act Broadband Program, December 17, 2009, at <http://www.whitehouse.gov/the-press-office/vice-president-biden-kicks-72-billion-recovery-act-broadband-program>

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<sup>13</sup> See BroadbandUSA: Connecting America's Communities, available at <http://www2.ntia.doc.gov/about>.

<sup>14</sup> The author is grateful to Professor Jon Gant for helpful comments concerning federal broadband initiatives.

<sup>15</sup> Zachary Spicer, Review of Karen Mossberger, Caroline Tolbert and William W. Franko, *Digital Cities: The Internet and the Geography of Opportunity*. Oxford University Press, January 2012. | British Politics and Policy blog at LSE. <http://blogs.lse.ac.uk/politicsandpolicy/archives/32060>.

<sup>16</sup> Karen Mossberger, Caroline J. Tolbert, and Ramona S. McNeal, *Digital Citizenship: The Internet, Society and Participation*. Cambridge, MA: MIT Press, 2008.

<sup>17</sup> Tony E. Wohlers and Lynne Bernier. "Innovative City Hall: A Comparative Study of Policy Adoption in the U.S. and France." *Journal of Information Technology and Politics*. Vol. 9, No. 4. 2012.

<sup>18</sup> Marc Holzer, M. Fudge, R. Shick, G. Stowers, & A. Manoharan. 2012. [U.S. Municipalities E-Governance Survey](http://spaa.newark.rutgers.edu/egov-publications); <http://spaa.newark.rutgers.edu/egov-publications>; Mossberger and Wu 2012

<sup>19</sup> Holzer et al., see above.

<sup>20</sup> In this category, the average score was only 4.69 out of a possible total score of 20, which is approximately only half as high as the average score of the lowest of the other categories. (Holzer, p. 79).

<sup>21</sup> *Ibid.*, pp. 77-78.

<sup>22</sup> Wohlers and Bernier, 2012.

<sup>23</sup> Moon and Norris 2005.

<sup>24</sup> See Wohlers and Bernier 2012 for a review of drivers and barriers to ICT adoption in municipal governments in large- and medium-sized cities.

<sup>25</sup> Mossberger and Wu found that social media use in city government websites increased between two and five times from 2009 to 2011 in their analysis of the 75 largest cities in the U.S. See Karen Mossberger and Yonghong Wu. "Civic Engagement and Local E-Government: Social Networking Comes of Age." Institute for Policy and Civic Engagement. University of Illinois Chicago. Working paper. February 2012.

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<sup>26</sup> Mossberger and Wu 2012. Figures from p. 6; quotation from p. 15.

<sup>27</sup> Hilbert 2009; Scott 2006, cited in Wohlers and Bernier.

<sup>28</sup> Lenihan 2005, p. 274, cited in Wohlers and Bernier.

<sup>29</sup> Luna-Reyes, L., Chun, S. A., & Cho, J. (2012). "E-participation and transparent policy decision making." *Information Polity* 17(2), 129-145.

<sup>30</sup> *Ibid.*, p. 139.

<sup>31</sup> Logan Harper, "10 tools to help open source cities maintain transparency," [opensource.com blog post](http://opensource.com/blog/post/2013/10/tools-open-source-cities), October 28, 2013. [opensource.com/government/13/10/tools-open-source-cities](http://opensource.com/government/13/10/tools-open-source-cities)

<sup>32</sup> For a summary of the history of 311 and its evolution to Open311, including interview results with some of the developers, see Manik V. Suri, "From Crowdsourcing Potholes to Community Policing: Applying Interoperability Theory to Analyze the Expansion of 'Open311'". Berkman Center for Internet and Society, Harvard. Research Publication No. 2013-18.

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<sup>33</sup> Ben Sheldon, “Hard Data on the Status of Open311,” Code for America, July 27, 2012. <http://codeforamerica.org/2012/07/27/hard-data-on-the-status-of-open311>.

<sup>34</sup> “3-1-1,” Wikipedia. [en.wikipedia.org/wiki/3-1-1](http://en.wikipedia.org/wiki/3-1-1), accessed November 1, 2013.

<sup>35</sup> The City of New York lists its official apps on the NYC Digital webpage and includes the NYC311 app as well as the NYPD app, NYC City Hall and NYC Stuff Exchange. The apps are available at <http://www.nyc.gov/html/digital/html/apps/apps.shtml>

<sup>36</sup> Steven Johnson, “What a Hundred Million Calls to 311 Reveal About New York,” *Wired.com*,

November 1, 2010, available at

[http://www.wired.com/magazine/2010/11/ff\\_311\\_new\\_york](http://www.wired.com/magazine/2010/11/ff_311_new_york).

<sup>37</sup> *New State Ice Co. V. Liebmann*, 285 U.S. 262 (1932), at 311. Justice Brandeis observed: “To stay experimentation in things social and economic is a grave responsibility. Denial of the right to experiment may be fraught with serious consequences to the nation. It is one of the happy incidents of the federal system that a single courageous state may, if its citizens choose, serve as a laboratory; and try novel social and economic experiments without risk to the rest of the country.”

<sup>38</sup> John Alford. 1998. “A Public Management Road Less Traveled: Clients as Co- Producers of Public Services.” *Australian Journal of Public Administration* 57(4): 128-37. Cited in Clark et al. 2012.

<sup>39</sup> A description of the management tools developed by SeeClickFix is available at [seeclix.com/government/management-tools](http://seeclix.com/government/management-tools)

<sup>40</sup> Tom Grubisich. “How SeeClickFix Built Revenue Streams from Potholes.” *Street Fight*. August 11, 2011. [streetfightmag.com/2011/08/11/seeclix-multiple-revenue-streams-government-and-media/](http://streetfightmag.com/2011/08/11/seeclix-multiple-revenue-streams-government-and-media/)

<sup>41</sup> All quotations in this section are from Ben Berkowitz, TED Talk at the University of Connecticut. Available on YouTube.

<sup>42</sup> Jen Pahlka interview on GovFresh.

<sup>43</sup> Mossberger & Wu, 2012, p. 4.

<sup>44</sup> See <http://www.nyc.gov/html/doitt/html/open/data.shtml>.

<sup>45</sup> See Mossberger and Wu, p. 5.

<sup>46</sup> See <http://datasf.org/>.

<sup>47</sup> See <http://www.cityofboston.gov/doi/apps/citizensconnect.asp>.

<sup>48</sup> See <http://www.cityofboston.gov/news/default.aspx?id=5571>.

<sup>49</sup> Patrick Administration and City of Boston announce 54 municipalities participating in Commonwealth Connect App. City of Boston press release. June 18, 2013. Available at [blog.seeclix.com/2013/06/city-of-boston-and-seeclix-announce.html](http://blog.seeclix.com/2013/06/city-of-boston-and-seeclix-announce.html)

<sup>50</sup> The announcement of NASCIO’s award for Massachusetts mTicketing is available at [http://www.nascio.org/awards/nominations2013/2013/2013MA4-Massachusetts\\_mTicketing%20nomination\\_Digital%20Govt-G%20to%20C\\_6.3.2013.pdf](http://www.nascio.org/awards/nominations2013/2013/2013MA4-Massachusetts_mTicketing%20nomination_Digital%20Govt-G%20to%20C_6.3.2013.pdf)

<sup>51</sup> See City of Virginia Beach, Virginia, Virtual Town Hall at <http://www.vbgov.com/community-connect/Pages/virtual-town-hall.aspx>

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<sup>52</sup> Bruce R. Lindsay, “Social Media and Disasters: Current Uses, Future Options, and Policy Considerations,” Congressional Research Service, September 6, 2011, p. 1. <http://www.fas.org/sfp/crs/homsec/R41987.pdf>.

<sup>53</sup> See ushahidi.com.

<sup>54</sup> See, for example, “Won’t You Be in My Nextdoor Network?” Wall Street Journal, available at <http://online.wsj.com/article/SB10001424127887324482504578454872810078476.html>; Drake Baer, “As Sandy Became #Sandy, Emergency Services Got Social,” Fast Company. November 9, 2012. Available at <http://www.fastcompany.com/3002837/sandy-became-sandy-emergency-services-got-social>.

<sup>55</sup> The Seattle Police Tweets by Beat program is described at <http://www.seattle.gov/police/tweets/default.htm>

<sup>56</sup> Robin Whithall, “Police Using Social Media: 4 Innovative Departments,” ArchiveSocial blog. May 20, 2013. <http://archivesocial.com/blog/police-using-social-media-4-innovative-departments/>

<sup>57</sup> Nancy Roberts. “Public Deliberation in an Age of Direct Citizen Participation.” *The American Review of Public Administration* 34, no. 4 (December 1, 2004): 315–353. Quoting p. 330.

<sup>58</sup> See Christian Bason, *Leading Public Sector Innovation: Co-creating for a Better Society* (Bristol, UK: the Policy Press, 2010.) See also MINDLab, Copenhagen, Denmark at [http://www.mind-lab.dk/en/about\\_mindlab/team/christian-bason](http://www.mind-lab.dk/en/about_mindlab/team/christian-bason).