City of Long Beach
Office of the City Auditor

Digital and E-Government Best Practices Report

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Introduction

The Office of the City Auditor initiated this non-audit assessment to document the City of Long Beach's (City) existing digital or e-government solutions and explore innovation and technology trends and best practices that would allow the City to enhance its services, communication and interaction with the public. This report is intended to provide information to assist in the Long Beach Mayor's Office's efforts to optimize the City's use of digital technology to better engage and serve constituents.

"Been There, Done That"

More than two decades ago, the Internet not only revolutionized commerce, but it also transformed how government institutions interact with constituents. The public sector became less reliant on the traditional service delivery model that involved face-to-face interaction with government employees. This new movement, often referred to as "e-Government" or "Digital Government," provided online capabilities to a variety of government processes, resulting in a more efficient service delivery system.

In 2001, after undertaking an internal e-Government strategic planning process, the City issued an e-Government plan with a citywide vision of "using technology to provide universal access for sharing up-to-date information, fostering two-way communications, providing services conveniently, and offering a public forum." Today, Long Beach's e-government efforts has provided constituents with access to a variety of government services and processes online, including:

- Payment of utility bills, various fines and fees, and parking citations
- Request for services, such as pothole repair and graffiti removal
- Registration for use of recreational facilities and activities, such as classes and programs
- Access to library materials and library account management
- Government employment information and applications
- Access to government meeting and agenda documents, e-comment ability on agenda items, as well as video streaming of government meetings
- Access to government codes and ordinances

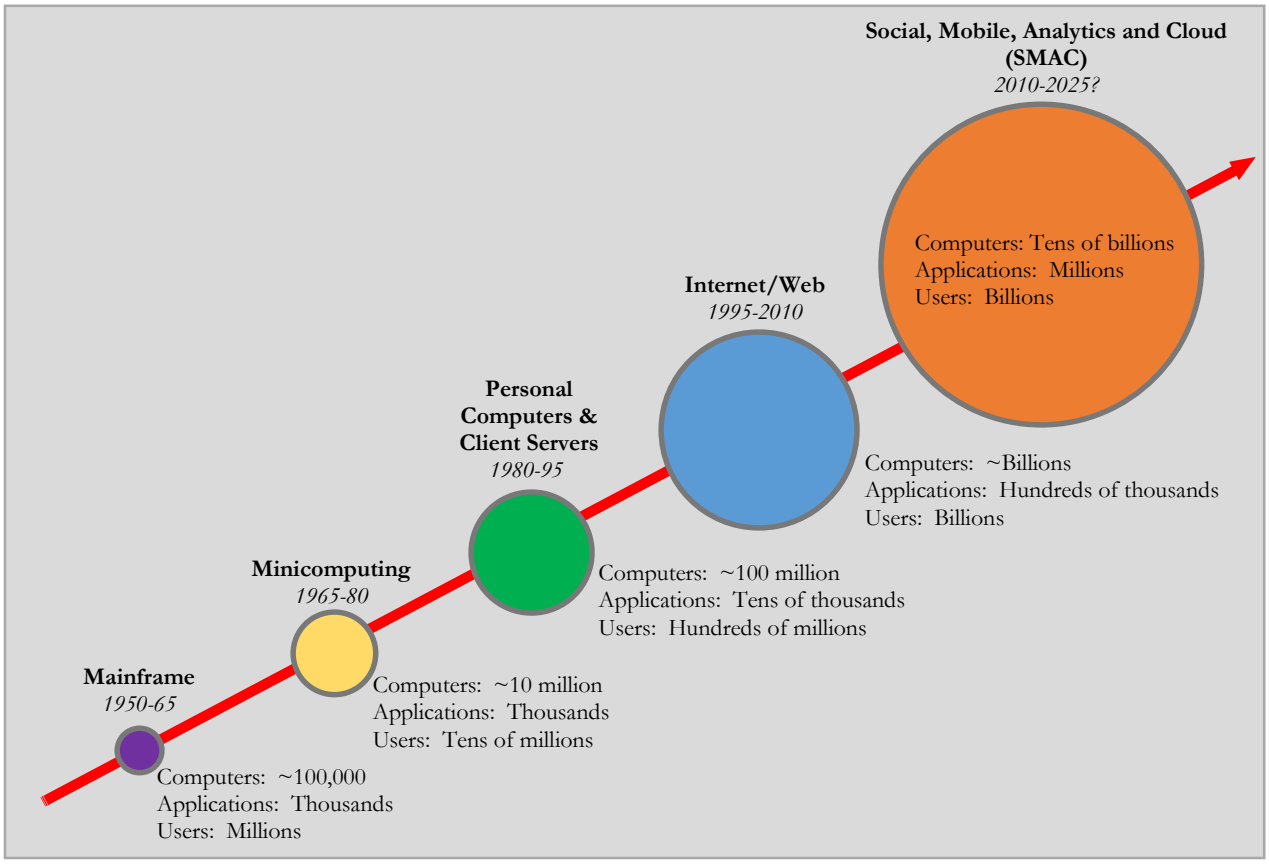
However, in conducting our analysis for this report, we found that the features of Long Beach's online services – payment, account access, program registration, completion and submission of forms, among others – that were once ambitious e-government initiatives for

many jurisdictions are no longer considered innovative or forward-thinking, but rather just standard practice. See Appendix I for a summary of how the City has been using technology in service provision across the organization.

What Are the New Drivers of Innovation?

As shown in the chart below, the evolution of computing has followed an innovation trajectory that started with the mainframe era (1950-65), followed by the mini-computing era (1965-80), personal computer and client-server era (1980-95), and the Internet/Web era (1995-2010). Currently, information technology is in its fifth innovation era that is driven by a combination of social, mobile, analytics and cloud computing technologies, collectively known as "SMAC."

Chart 1.
Evolution of Information Technology
1950-present



Source: Nicholas Evans, Unisys, in *ComputerWorld*, using data from Cognizant, IDC, Unisys and others.

Each of the pillars of SMAC has already brought significant change to how governments operate. However, when these technologies are integrated, the impact is far greater. There is growing efforts to realize the convergence of SMAC technologies in the public sector to positively impact government efficiency, services, and capabilities. Below is further discussion on each SMAC pillar and examples of how local government have deployed these technologies.

Social: Organizations are using social media – such as Twitter, Facebook, YouTube, Instagram, and blogging sites – to better target customers, stay in contact with constituents, and obtain feedback. Local governments have been using social media primarily as a one-directional communication tool to deliver news, videos, alerts and advisories. However, some governments are increasingly using social media as a multi-dimensional communication platform, including providing immediate interaction with citizens during large events and analyzing social media data and information to identify service problems and trends.

According to the Pew Research Center Internet Project, as of Jan. 2014, 74% of online adults use social networking sites, with 52% of online adults now using two or more social media sites.

Local government examples:

Push and Data Analytics

The County of Los Angeles partnered with the social media site, *Yelp*, to add health inspection grades to restaurant listings. Users can now read restaurant reviews along with current health inspection scores. On the flip side, Chicago utilized social data analytics tool to monitor *Twitter* for chatter related to food poisoning at food establishments and then correspond with users to obtain information and investigate possible health code violations.

Large Event Management

During the 2012 NFL Super Bowl events that lasted several weeks, the City of Indianapolis and NFL were involved in setting up the Super Bowl Social Media Command Center, which used social media analytic tools to monitor real time chatter about the Super Bowl events and then quickly respond to users' questions and complaints regarding trash, parking, crowd control, and other related issues. They were also able to direct appropriate resources to the right places before these issues intensified.

Service Request and Problem Reporting

The City of Boston, like many other cities, has a mobile app, called *CitizensConnect*, that allows users to report problems such as potholes, graffiti and damaged signs. However, Boston takes this one step further by using social media to capture problems and service requests from constituents' tweets to the city's *Twitter* account, *@CitizensConnect*. Followers can also view and track all service requests reported by other users through the City's *Twitter* account, mobile app and website.

Mobile: Smartphones and tablets have transformed how digital content is accessed. These devices have become a powerful platform to deploy mobility applications, particularly in retail (mobile commerce), finance (mobile banking and payments), customer relationship management, improved sales and marketing strategies, and supply chain and product management. The public sector has also been gradually developing mobile applications or using third-party apps to enhance their web-based services and/or expand services beyond the traditional service delivery systems. Furthermore, governments have been encouraging local software developers to develop mobile and other digital applications that use available government data to address communities quality of life issues.

According to the Pew Research Center, as of Jan. 2014, 90% of American adults have a cell phone, 58% own a smartphone, and 42% own a tablet computer.

Local government examples:

Service Enhancement

In 2014, the City of New York sponsored the Big Apps NYC competition to encourage public participation in developing technology solutions to local issues. A winner of the Big Apps NYC competition, *Explore NYC Parks* is a third-party web and mobile application to link to the city's internal databases and enable users to find information on the city's 1,700 parks, playgrounds, and recreation facilities. Users can filter parks by offered amenities, find upcoming events, and obtain suggestions for park activities.

Constituent Collaboration (Crowdsourcing)

In Detroit, a public-private-nonprofit partnership has been attempting to map and photograph all of the city's properties and provide condition information for each property. This effort is aided by the *Blexting* mobile app, which allows citizens to survey blighted properties and feed information to the existing Blight Removal Task Force property database, which keeps track of blight related problems.

Marketing and Promotion

The City of Seattle's Office of Arts & Culture uses a third-party app, called *STQRY*, to promote the city's permanently installed public art collection. The app helps users locate by GPS new works of art and obtain information via code scanner on each art piece, including its history, artist statement, historic images and video. *STQRY* currently features 50 works of art from the city collection, as well as art and public art works from other local cities and museums in the Seattle-area.

Analytics: Every year, companies, governments and individuals generate vast amounts of digital data through social and mobile technologies, as well as through traditional systems. To enhance transparency, more and more governments are adopting open data initiatives, which aspire to provide the public with access to more government data, including procurement records, financial data, service requests, and operational performance, among others. But many jurisdictions are moving beyond simply providing access to government data by integrating different datasets and analyzing the information to identify problems and concerns, and even predict when problems may arise.

> In 2013, SINTEF, a technology innovation research company, estimated that a full 90% of all the data in the world had been generated over the last two years.

One emerging innovation trend that involves SMAC, particularly data analytics, is called the "Internet of Things," which represents the growth of physical objects or products embedded with sensors, GPS and other network connectivity technologies to collect and exchange pertinent real time data without human transactions. The ability to collect data in real time allows us to be more efficient by immediately knowing when things need adjusting, replacing, repairing or recalling. Examples of such technologies include items such as washers and security systems that collect usage data and allow for remote access and control, and environmental devices that monitor of air or water quality and atmospheric or soil conditions.

Local government examples:

Open Data / Data Access

The Los Angeles Mayor and City Controller offer two open data portals that provide the public with online access to nearly 1,200 government datasets, charts, and maps that are downloadable and in easy-to-read formats. The data includes the city's finances, payroll, revenues, purchasing, accounts, and performance data from various departments. The public can now easily see which vendors do business with the city, how much is spent on street maintenance, parks and library services, and high-level measures of the city's performance with respect to the mayor's four priority areas: public safety, livability, economic prosperity and government efficiency.

Predictive Data Analytics

Funded by the Bloomberg Philanthropies, the City of Chicago's *SmartData Platform* pulls together large amounts of diverse data from different departments, and identifies correlation and trends between these datasets to prevent problems before they arise. Such data includes police reports, 311 call center reports, 911 calls, public Tweets, emergency operations data, video feeds from surveillance cameras, and city bus location data. *SmartData*

provides a friendly interface in which users can query the data by type, time and distance from a given location, and display the data by mapping and other ways.

SmartData has already been used to address rodent outbreaks by identifying over 30 statistical factors occurring across agencies that can predict rodent outbreaks seven days in advance, allowing city crews to deploy more quickly and proactively. Since this project started, the city has reported a 35% decline in rat-related complaint calls.

Eventually, the city plans to use *SmartData* to address other areas within public health, traffic management, public safety and infrastructure maintenance to avert before crises situations and save money, time and other resources. Lastly, *SmartData* was developed in an open source manner, which means its IT infrastructure is freely available to other municipalities for replication.

The Internet of Things

In 2011, the San Francisco Municipal Transportation Agency implemented *SFpark*, the first large-scale smart parking initiative that utilized cutting-edge technology, including automated parking meters and in-street sensors at each parking space. This technology submits data regularly to software that enables the agency to know when parking spaces are being used and for what length of time, allowing the agency to adjust parking rates in accordance with market demand to ensure that parking occupancy remains at optimal levels. *SFpark* also involves a mobile app that provides drivers with real-time pricing and availability of parking spaces, as well as the ability to pay by credit card and pay-by-phone.

In June 2014, the agency released an evaluation report showing that since its inception, the use of *SFpark* has resulted in cheaper parking prices overall (4-12% lower hourly rates), more readily available parking (street blocks were full 16% less often), fewer parking citations (23% decline), less time wasted by drivers circling around looking for open parking spots (43% decrease in average search time), and fewer miles traveled (30% decrease).

Cloud Computing: Cloud computing involves moving software and data storage from personal computers and/or local servers with limited access to remote servers, providing an increasingly mobile workforce with access to data, information, and applications from anywhere. Organizations, including governments, have traditionally purchased and operated their own IT infrastructures. With cloud computing, operation of the IT infrastructure moves to a vendor. The primary benefits of cloud computing to local governments are:

In a 2013 Center for Digital Government survey, 46% of state and local government respondents indicated that they had, or was planning to, implement a cloud offering. Among them are web applications (70%), data storage (60%), and email (40%).

- Reduced operating costs – A city's investment in hardware and software is reduced, as cloud computing leverages economies of scale and uses consolidated, centralized computing resources.

- Increased flexibility and scalability – Cloud computing offers more flexibility in matching IT resources to business functions. Organizations using cloud computing can add and subtract IT capacity from the vendor as the data and user needs increase, rather than having to purchase and install additional hardware and software. With the trend towards greater data accumulation and analysis, having the ability to adjust "on-demand" IT resources and capacity will be critical to local governments.

- Improved information use and integration – Governments are often "siloed" and so too are the information systems used across different departments. Cloud computing replaces stand-alone business processes and data systems with centralized and integrated resources and, thus, helps simplify collaboration within and across departments. Cloud computing is a critical, foundational component of SMAC as it involves the communication and integration of applications, platforms and data.

Local government examples:

Email, Collaboration and Office Productivity

Many governments have transitioned to providing cloud-based data storage, and email and office business applications. In 2014, on a citywide basis, Long Beach migrated more than 4,000 email accounts to the cloud by implementing Microsoft Office 365, a cloud computing system that includes email and calendaring, desktop productivity software, web conferencing and content collaboration. Transitioning to the cloud provides users expanded data storage and access to these resources.

Financial and HR Management

The City of Orlando had been using antiquated financial and HR systems that were expensive and cumbersome to maintain. In 2014, Orlando turned to Workday, Inc., a cloud-based software vendor and migrated to Workday's unified suite of applications, including financial and human resources management. This transition consolidated and streamlined day-to-day administrative processes, such as absence management, payroll processing, revenue and expense management, and management reporting.

Customer Relationship Management

The City of Philadelphia needed a solution to ensure that its 311 constituent contact center had the IT capacity to accommodate the expected rise in calls to the 311 contact center, averaging about 1.2 million calls per year. In 2014, the city transitioned to Salesforce's cloud-based government customer relationship management platform, which provides the ability for constituents to request a service, ask a question or lodge a complaint by landline, text, mobile app, and web, or through *Facebook* and *Twitter*.

Where Are We Now and Where Are We Headed?

Improved technology capabilities lag behind municipal leaders

As mentioned earlier, Long Beach has been providing online capability for many core services and information for some time. The City has also begun to place resources and systems in cloud environments. In October 2010, Long Beach launched the GO Long Beach mobile app, allowing community members to report problems such as potholes, graffiti, sidewalk damage and other service needs. Users can upload a photo of the problem through the application, reporting the location of the issue with GPS tracking technology. GO Long Beach was followed by several City mobile apps developed separately by various departments (see Appendix I for more detailed information on each of these apps):

- GO Long Beach Animal Care Services
- GO Long Beach Police Department
- GO Long Beach Public Library
- GO Long Beach Airport
- Vote Long Beach (City Clerk Department)
- Report a Water Waster (Water Department)
- My Long Beach City Auditor (City Auditor's Office)

In November 2014, the City of Long Beach earned sixth place for large cities nationally in the annual Center for Digital Government's 2014 Digital Cities Award, which is based on a national survey that measures performance and use of technology by cities to enhance service to residents and businesses. The City was recognized for offering graphic design and video editing software at the public library, replacing the obsolete utility billing system, migrating to cloud-based Microsoft Office 365, providing Wi-Fi access at City parks and facilities, and developing new mobile apps listed above. While Long Beach's technology improvements have been recently recognized, the City lags behind those jurisdictions that are often acknowledged to be technology and innovation leaders, such as Chicago, New York City and San Francisco.

Recent developments point to expanded innovation efforts

However, many of the Long Beach's latest technology-driven efforts are an indication that the City is positioning to adopt similar innovation initiatives that are currently being lauded in local government. In fact, two of the Mayor's policy focus areas involve leveraging technology

in city government and increasing civic engagement. The following are recent developments that signal the motivation of City leadership in moving towards developing and implementing the kinds of SMAC technologies that are discussed earlier in this report:

- ***Renaming of the Technology Services Department:*** The Mayor's FY 2015 Budget Recommendations announced the renaming of the Technology Services Department to the new Technology and Innovation Department, which is expected to "lead the way to making government more open, accessible, and innovative." This shift indicates a higher prominence of technology and innovation in City operations and organization, as well as an emphasis on open and accessibility of City data.

- ***Technology and Innovation Commission:*** In October 2014, the Long Beach City Council approved a city ordinance to create the Technology and Innovation Commission with the following purpose:

    1. To advise the Council on new technology, including research, development and operation of new technology;

    2. To provide a forum for the exchange of ideas to increase the effectiveness of information technology management;

    3. To support and assist in the strategic direction and implementation of information technology and communication; and

    4. To assess new technology to assist the City in improving efficiency, quality and accountability.

    In the beginning of 2015, the Mayor announced the appointments to the seven-member commission. The composition of this commission signals a focus on open data technologies and on partnerships with Long Beach City College and Cal State Long Beach, as recommended in the Mayor's budget recommendations.

- ***2014 Code for America Fellowship:*** The City was one of ten recipients of the 2014 Code for America Fellowship program to help Long Beach develop and implement a data analytics project to address a common service problem in the City – the fact that 52% of 2013's emergency medical calls came from just 10% of physical addresses. Through this program, a team of technology experts worked with the City to develop a web application, AddressIQ, that combines and analyzes data from the Fire and the Police departments on a daily basis and cross references them with business license data. The City can then identify by address the number and type of emergency calls,

understand call history and trends, and make better decisions in coordinating targeted care and resources.

- ***2015-2018 Bloomberg Philanthropies Innovation Team Grant:*** Long Beach was among 12 U.S. cities awarded a share of the Bloomberg Philanthropies Innovation Team Grant, which aims to improve the capacity of government by creating teams of in-house innovation experts to effectively design and implement new technology-driven approaches that can solve municipal problems and improve citizens' lives. Long Beach will receive a total of $3 million over three years, with the City contributing a match of $1 million for the grant project. It is expected that the Long Beach Innovation Team will first be tasked with improving access to city services and spur economic development.

Based on the City's current technology capabilities, major technology initiatives underway and the innovation trends occurring in local governments, it is reasonable to expect that Long Beach's technology and innovation pathway in the next several years will likely involve SMAC concepts and tools discussed in this report.

Considerations for Long Beach Innovation

The City as a Laboratory and Facilitator

As noted, the Bloomberg Innovation grant allows the City to form an Innovation Team to implement new technology that provides solutions to municipal problems and improves constituent lives. In the last five years, according to the IBM Center for the Business of Government's 2014 report, "A Guide for Making Innovation Offices Work," there is a growing trend in government to create innovation offices, innovation teams and/or appoint chief innovation officers to encourage a culture of innovation to produce external impacts on the larger community, and/or produce internal impacts within government. According to the IBM report, these innovation offices or teams come with great fanfare and promise, but they are relatively new and there is "no clear sense of how these efforts are tied together across governments or anchored in strategic priorities within particular governments."

While the Long Beach Innovation Team had not yet convened at the time of this report, the City's proposal for the Bloomberg grant suggests the Innovation Team would serve as an autonomous "laboratory" charged with developing new technologies, products, fixes, or programs, sometimes in partnership with other internal or external groups. The Innovation Team is likely to also act as a "facilitator" responsible for pulling together the City's departments to work on external projects or internal improvements.

Critical Success Factors

The IBM report assessed the different models for innovation offices, the challenges they face, and the factors that are critical for them to succeed. What follows is a summary of this report's seven key success factors for policymakers and management to consider before establishing government innovation offices of innovation teams.

1. ***Commit to supplying real resources.*** While governments must be flexible and adaptable with technology, successful innovation requires a commitment from the entire organization. According to government CIOs and others in similar posts, it is necessary to have a certain commitment of resources that is tangible, steady and more than salaries alone. For Long Beach, the $3 million Bloomberg grant is expected to cover all of the annual personnel costs of the new innovation team, with a small portion of personnel costs (about $68,000 per year) to be covered by in-kind City funds. The IBM report noted that committed resources from the government may not necessarily be large or monetary, as smaller commitments can encourage the pursuit of more creative solutions, such as private-public partnerships.

2. ***Choose leaders carefully, and invest in and provide appropriate support to those leaders.*** Crucial to success is competent and flexible leadership who possess understanding and knowledge of how government works. Most importantly, the Innovation Team must have access to and support from those above. Hence, executive leadership is critical. An organizational champion can direct resources to projects, clearly articulate the value proposition of projects throughout the City organization, and garner support from different stakeholders. This executive leadership must also develop internal champions within the organization at the department level. According to the Bloomberg grant application, the Mayor's Office will be responsible for strategic direction, and a new Innovation Director working out of the City Manager's Office will lead the day-to-day activities of the team.

3. ***Create a specific mission tied to specific impacts.*** The Innovation Team's mission and goals must be specific, realistic and reflective of available resources and local experiences and circumstances. This involves the development of a strategic plan that clearly defines the mission, goals and objectives of the City's innovation and technology initiatives. These goals and expectations must be aligned with larger strategic goals and objectives of the City, and should address both internal impacts (e.g., interagency coordination and collaboration) and external impacts (e.g., increased access and transparency). If the City decides to implement open data and data analytics projects, the strategic plan should involve the development of a data policy that defines what data will be released, data administration, data sharing, security, privacy, and legal policy regarding the available data. Lastly, the strategic plan should be organic, recognizing the need to evolve over time.

4. ***Communicate effectively with internal and external partners throughout the innovation lifecycle.*** Effective communication is vastly important, as it can foster or diminish trust and set realistic or unattainable expectations. Technology changes require the ongoing buy-in and collaboration of City stakeholders. Communication must be targeted at different stakeholder groups, including City employees, constituents, partners and funders. City staff and outside stakeholders may need to be educated on the meaning and value of SMAC technologies, and how they can be used to benefit the City and constituents. The IBM report cautions against rushing to produce results and release products, and holding large, flashy public events with constant press releases, as this can set the wrong expectations and disengage stakeholders. A strategic plan would help facilitate and frame this communication.

5. ***Find allies within government and committed partners outside of government.*** Governments must work with finite, limited resources. Innovation initiatives must

operate within this context. The City of Long Beach is a relatively large organization with different internal entities and operating systems. The different departments must be able to identify the value of participating in innovation initiatives. The Innovation Team has to integrate its work with that of the Technology and Innovation Department, as the City's communication and information systems must be able to efficiently support and sustain any innovation projects.

Externally, rather than opening the doors to all outside stakeholders, the Innovation Team should target recruitment of external allies who can bring specific resources, expertise, access, and attention to the specific work or project. External allies include individuals, companies, funders, nonprofit organizations, and universities. The newly formed Long Beach Technology and Innovation Commission is expected to fulfill some of this role, as its membership brings experience from the private, public, nonprofit and academic sectors.

6. ***Establish an innovation process from the outset, even if the exact details and specific projects change over time.*** One of the biggest challenges faced by innovation initiatives is selecting the projects to pursue and identifying the partners to involve and the resources to allocate. It is recommended that the City establish clear protocol and guidelines for selecting and piloting projects from the very beginning. A transparent, systematic process can help the City avoid undertaking limited value or unrelated projects, particularly in the early stage of the initiative, and provide opportunities for stakeholder input and buy-in. Many government innovation offices recommend increasing the scale of projects over time. Developing successful smaller-scaled projects can quickly demonstrate the initiative's value and credibility, but these projects should fit in with the long-term goals of the initiative.

7. ***Seize opportunities to share lessons and information emerging from government innovation offices through both formal and informal networks.*** Innovation teams should take advantage of existing networks to discuss and share ideas, challenges and opportunities with their counterparts from other jurisdictions. Because the City is involved with both Code for America and Bloomberg Philanthropies, it is connected to many other local governments that are developing or have already undertaken innovation initiatives that it can tap into. Furthermore, many leading open data and data analytics projects were open source developed. This means that Long Beach and other cities might not be required to reinvent the wheel, as these projects' entire infrastructures or frameworks can be freely adopted and adapted to their local needs.

Appendix I: City of Long Beach's Digital Services

We conducted a scan of citywide e-government services to identify what is currently offered. We reviewed services that are enhanced by technology (i.e. telephone, online, mobile apps, etc.) to help facilitate easier interaction between citizens' and their local government.

The City also employs technology internally within departments for more effective or efficient operations; however, this was not included in our scope. Our focus was on technologies that are used by and impact citizens directly. This includes cloud computing, which also improves the efficiency and cost effectiveness of IT operations while providing innovation that explicitly impacts constituents.

The chart below provides examples of the technologies offered by the City and how they compare to what other jurisdictions are using. We did not include every single instance of the use of technology found during our internal scan as that would be very lengthy, but below are some of the major technologies that the City uses to interact and transact with constituents.

PLATFORM	SERVICE TYPE	DETAILS
Mobile Apps		
Go Long Beach	Request a Service or Report a Problem; Status Update; Searchable Database Information	The *Go Long Beach App* is mostly comparable to other 311 Service Request Apps, including those belonging to the cities of Los Angeles, Sacramento, Chicago, New York City, and San Francisco. The App let users report problems and track service requests for broken streetlights, potholes on the road, graffiti on public buildings and more.
LBPL Mobile (Public Library)	Account Access; Customer Feedback; Information Exchange; Request a Service; Searchable Database Information	The *LBPL Mobile App* is mostly comparable to other Public Library Mobile Apps, including those belonging to the public libraries of the cities of Fresno and Seattle. This app lets patrons search the library catalog, manage their library account, see where library materials are available, place and manage a hold, renew an item, connect with a librarian on social media, email or phone, get

PLATFORM	SERVICE TYPE	DETAILS
		reading recommendation, obtain general library information and more.
Various Third-Party Library Digital Content Access Apps  Third-party apps	Access Library Digital Content	Like most public libraries, the Long Beach Public Library offers a vast array of digital content to patrons, such as eBooks, audio books, digital magazines, among other library digital media. However, unlike other public libraries mobile apps, such as the Los Angeles and San Diego Apps, where digital media, such as e-books and audiobooks, are accessible and integrated in one mobile app, digital content is not accessible within the *LBPL Mobile App* itself. To access digital content, patrons must download separate third-party applications for their smartphones, tablets, eBook readers, among other electronic devices.
GO LBPD	Information Exchange; Report a problem; Status Updates; Searchable Database Information	The *GO LBPD App* is comparable to other Police Departments Mobile Apps belonging to cities such as Sacramento, Santa Ana, and Meza, AZ. *GO LBPD* is used to increase communication and awareness among city residents by providing access to information relating to news, crime prevention, alerts, events, social media feeds, integrated crime maps and more. The app also provides the ability to submit and follow-up on crime tips.

PLATFORM	SERVICE TYPE	DETAILS
Long Beach Animal Care Services	Information Exchange; Searchable Database Information	The *Long Beach Animal Care Services App* seems to be unique to Long Beach. We were not able to find another municipal app for animal care services. This mobile app allows local pet owners and animal lovers to search for adoptable cats and dogs, find emergency vets and local dog parks, search for impounded animals, and access social media feeds. In addition, users can receive notifications from ACS with news and updates about upcoming low-cost clinic and special events.
Long Beach Gerald Desmond Bridge	Information Exchange	The Port of Long Beach's *LB Bridge Mobile APP* keeps local residents informed regarding the Gerald Desmond Bridge Replacement Project. The mobile app provides up-to date road conditions, video access to live camera feeds, and traffic alerts through push notifications, and audio feeds.
Long Beach Airport	Information Exchange; Searchable Database Information	The *Long Beach Airport App* is comparable to other local Municipal Airport Mobile Apps, including Los Angeles, Santa Barbara, and Santa Maria. This mobile app provides travelers with access to real-time flight arrival and departure information. Informative tabs provides flyers with valuable information to navigate the Long Beach Airport and to take advantage of its many amenities, such as airport parking information, restaurants, shopping, ground transportation options, terminal maps, social media feeds, and links to other points of interest within the City.

PLATFORM	SERVICE TYPE	DETAILS
Vote Long Beach	Information Exchange; Request a Service; Status Update; Searchable Database Information	The City Clerk's *Vote Long Beach App* is comparable to other Voting Mobile Apps, including Denver. With this app residents can know when, where, and how to vote on city elections. Users can locate a polling place, request and track a vote-by-mail ballot, share election buzz on Facebook and Twitter, and receive instant election results.
Report a Water Waster	Report a Problem	The Water Department's *Report a Water Waster App* is comparable to other Municipal Water Reporting Apps, including those of the cities of San Diego and Indio. This app enables residents to share the location of water waste, upload a photo and report a water use violation within the City.
Pulse Point	Information Exchange	The Long Beach Fire Department recently implemented the *Pulse Point App*, a third-party app that is gaining widespread adoption throughout California and the rest of the U.S. The *Pulse Point App* alerts citizen responders who know CPR to local emergencies near them and to the location of the nearest AED (Automated External Defibrillator).
My LB Auditor	Customer Feedback; Information Exchange; Report a Problem	The *MyAuditor App* is designed to provide the citizens of Long Beach the opportunity to learn more about the Long Beach City Auditor and her Office. This app is the first of its kind among California municipal audit offices. In addition to finding out more information about the City Auditor's authority and duties, citizens will be able to learn about fraud and report it directly through the app itself, read

PLATFORM	SERVICE TYPE	DETAILS
		issued audit reports, keep up with auditor news, and offer ideas and suggestions.
Automated Phone & Text Message Systems		
Automated Phone System/Interactive Voice Response System (IVR)	Payments	Several city departments use an *automated phone system* to process self-service payments for certain city accounts via debit or credit card, including: • Utility Billings (Gas, Water, Sewer & Refuse) • Parking Citations • Business License • Ambulance Billing Payments • Collection Account Payments
LB ReConnect	Request a service	The City's Parks& Rec *Touch-Tone Registration Phone System (LB RecConnect)* allows residents to search, register and pay for recreation classes.
LB Text a Librarian	Request a Service	The Long Beach Public Library allows patrons to ask librarians questions via text message.
LB Reverse 911 System	Information Exchange	The City has implemented a *Community Emergency Notification System ("Reverse 911"),* enabling the City to rapidly notify residents and businesses by telephone. In case of natural disaster or other emergency, the reverse 911 system will automatically call listed and unlisted land-lines within the affected area and deliver a recorded message.

PLATFORM	SERVICE TYPE	DETAILS
Nixle	Information Exchange	Long Beach PD uses the third-party *Nixle platform*, to send real-time text based alerts to registered mobile numbers.
Text Crime Tip Program	Report a problem	Long Beach *PD Text Crime Tip Program* allows residents to submit crime tips from a mobile device as a text message or SMS.
Online City Services		
Go Long Beach Online Platform	Request a Service/Report a Problem Status Update	As mentioned earlier, the *Go Long Beach App* is similar to other 311 mobiles apps, which also feature an online platform where users can report broken streetlights, potholes on the road, and graffiti on public buildings, among other service request online. Additionally, users can track the City's response or the status of their service request at this online/webpage platform.
Legistar	Searchable Database	The City offers multiple databases that can provide citizens with the ability to search and find information on their own. Overall, the City provides searchable information that is comparable to that offered by other cities. One example of an available searchable database is *Legistar,* which provides City Council and Committee meeting agendas, minutes, and actions in a searchable format.
Contracts Online	Searchable Database	The City Clerk's Office has implemented *Contracts Online*, where individuals can search for copies of certain contracts (contracts, agreements, amendments, leases, certain permit agreements, etc.) between various vendors and the City.

PLATFORM	SERVICE TYPE	DETAILS
NeoGov	Searchable Database	*NeoGov*, a third-party platform, facilitates several HR functions allowing users to access City job postings and apply for these positions online.
Online Account Access	Account Access	Access to account information online in Long Beach is mostly comparable to the access level found in other cities. It is important for users to be able to update account information, track bills and payments, manage services, and more online. The City offers that for various accounts, including, utility billing, recreation programs, and library services. While the City provides varied self-services online, there is room for improvement. Specifically, the City can provide additional self-services commonly found in other municipalities, such as enabling residents to start or stop a City utility service online.
Online Payments	Payments	It is common for citizens to be able to pay for some city services online for convenience. This is true in Long Beach and other municipalities. Long Beach offers submittal of online payments via debit card, credit card, or electronic check for certain city services such as ambulance billing, utility services, parking citations, and recreation programs. However, while the City is comparable with other jurisdictions for providing online payment for these major services, there is room for improvement. The City can expand the services it accepts payment via online, such as online payment of library fees/fines.

PLATFORM	SERVICE TYPE	DETAILS
E-comments	Customer Feedback	Long Beach, like most cities, wants to receive feedback from their citizens, which can be done easily online. The City Clerk's *e-Comment* provides residents and voters with the ability to submit their comment for upcoming agenda items that will be distributed to Mayor and City Council, citywide elected offices, and department staff.
Online Surveys	Customer Feedback	The City allows feedback online for various departments and services, including online surveys for Harbor, Housing, Parks and Recreation, PD Crime Lab, Environmental Services, etc.
Contest a Parking Citation Online	Appeals	Residents can submit an online request to contest a parking citation.
Social Media		
Various Social Networking Sites, including: • Facebook • Twitter • Instagram • LinkedIn • YouTube • Flickr • Among others	Information Exchange	Long Beach is using social media to share information to increase citizen's understanding of city services. The City maintains four official social media accounts providing a citywide perspective (Facebook, Twitter, YouTube, and Flicker). In addition, City departments and agencies are using multiple popular social media tools as a channel to provide information, communicate, and provide greater citizen engagement. For example, Long Beach Police is using Facebook, YouTube, and Twitter for everything from soliciting crime tips to sharing safety related information and improving community relations.

Appendix II: Reference Resources

As part of this report, we conducted a review of publications, including books, academic and professional research papers, internal studies from other municipalities, and other materials regarding innovation and technology best practices with a focus on the public sector. Below is a list of these references that we found to be relevant and useful, as well as organizations in which we found pertinent resources.

ORGANIZATIONS

Ash Center for Democratic Governance and Innovation, Data-Smart City Solutions Initiative, Harvard University, John F. Kennedy School of Government
www.innovations.harvard.edu
datasmart.ash.harvard.edu

Bloomberg Philanthropies, Government Innovation Program
www.bloomberg.org/program/government-innovation

Brookings Institution, Center for Technology Innovation
www.brookings.edu/about/centers/techinnovation

Center for Digital Government
www.govtech.com/cdg

Code for America
www.codeforamerica.org

Governing Institute
www.governing.com/gov-institute

GovLoop
www.govloop.com

IBM Center for The Business of Government
www.businessofgovernment.org

Institute for Local Government
www.ca-ilg.org/public-engagement-technology

International Association of Chiefs of Police (IACP) Center for Social Media
www.iacpsocialmedia.org

Pew Research Center, Internet, Science & Technology
www.pewinternet.org

Public Technology Institute
www.pti.org/index.php

TechAmerica Foundation
www.techamericafoundation.org

U.S. CIO Council
cio.gov

U.S. City Open Data Census
us-city.census.okfn.org

Center for Technology in Government, University at Albany, State University of New York
www.ctg.albany.edu

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